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#### Content

- Upload COs for all courses

**COURSE OUTCOME**

**FACULTY OF PHARMACY**



# B. Pharm

Bachelor of Pharmacy (B. Pharm)  
Batch 2018-21  
**Program Outcomes (PO)**



**Marwadi University Rajkot**

Students of all undergraduate pharmacy degree programs at the time of graduation will be able to learn:

**PO 1:** Patient counselling and community service:

The students will be able to acquire adequate knowledge of patient counselling, drug interactions and latest advances in the field of pharmacy to serve the community better.

utilize and share this knowledge with practitioners for the betterment of health in society. Students will be able to continuously upgrade professional information and be conversant with the latest advances in the field of pharmacy to serve the community better.

**PO 2:** Domain knowledge of the field:

The students will be able to learn adequate knowledge, practical skills and basic principles related to pharmacy subjects.

**PO 3:** Professional skills required for pharmacy:

Students will be able to demonstrate skills necessary for the practice of a Pharmacy profession viz. the pharmaceutical legislation, Acts, laws and their implications, synthesis and analysis of medicinal agents, prescription analysis, quality assurance, and regulatory aspects, manufacturing, and storage of pharmaceutical products, and screening of various medicinal agents using animal models for pharmacological activity.

**PO 4:** Acquire practical skills:

Students will be able to learn practical aspects of APIs synthesis and analyze various pharmaceutical dosage forms as per standards of official books (e.g., WHO, USFDA, MHRA). They will learn pharmacological screening and biological standardization and in-vivo drug interactions, extraction of medicinal plants, the importance of various herbal formulations, Product detailing, marketing, distribution, and selling of pharmaceutical products.

**PO 5:** Professional assistance to physicians and marketing skills:

They will be able to explain and assist the physicians with prescription analysis and drug interaction. They will also be able to market the medicinal agents for diagnosis, prevention, and therapeutic purposes.

**PO 6:** Formulations and manufacturing of drugs:

The students will acquire in-depth knowledge of formulation, quality assurance, and storage of various pharmaceutical dosage forms including herbal medicines. The students will be able to understand the concept of community pharmacy and be able to participate in health care programs.

**PO 7:** Community pharmacy and social responsibility:

Students will be able to apply the current knowledge of Pharmacy in the best interest of the patients and the community by maintaining high standards of professional ethics.



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Students after the completion of graduation in degree pharmacy programs able to:

**PSO 1:** To impart theoretical knowledge in Pharmaceutics, Pharmaceutical Chemistry, Pharmacology, Pharmacognosy fields as well as practical training and skills development among students through industrial training and research to meet the challenges of the pharmaceutical field

**PSO 2:** Capable to work in a diverse environment on various projects related to pharmaceutical research in the context of developing technologies in various disciplines as well as regulatory aspects of pharmaceuticals.

**PSO 3:** To prepare students for future jobs in Hospital Pharmacy, CHCs (Community Health Centres), District Hospitals, Tertiary & Teaching Hospitals, other public sector hospitals and Clinical Pharmacy etc. and develop entrepreneurship skills.



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**Marwadi University Rajkot**



Students of all undergraduate pharmacy degree programs at the time of graduation will be able to learn:

<b>Course Outcomes Semester-I B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Human Anatomy and Physiology – I 13PH0101	CO1	Explain the gross morphology, structure and functions of various organs of the human body.
	CO2	Describe the various homeostatic mechanisms and their imbalances.
	CO3	Identify the various tissues and organs of different systems of human body.
	CO4	Perform the various experiments related to special senses and nervous system.
	CO5	Appreciate coordinated working pattern of different organs of each system.
Pharmaceutical Analysis 13PH0102	CO1	To understand the principles of Volumetric and electro chemical analysis
	CO2	To carryout various volumetric and electrochemical titrations
	CO3	To develop analytical skills
	CO4	To understand working of analytical instruments
Pharmaceutics - I 13PH0103	CO1	Know the history of profession of pharmacy
	CO2	Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations
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	CO2	understand the medicinal and pharmaceutical importance of inorganic compounds
	CO3	Able to know the properties and medicinal uses of inorganic compounds
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Communication Skills 13CS0105	CO1	To understand the behavioural needs for a pharmacist to function effectively in the areas of pharmaceutical operation
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	CO4	To trained for interview
	CO5	Able to develop leadership qualities and essentials
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	CO2	Understand matrices and Determinant
	CO3	Analytical geometry, Calculus, differential equation and Laplace transform
Remedial Biology 13BI0101	CO1	Know the classification and salient feature of five kingdoms of life

	CO2	understand the basic components of anatomy and physiology of plant
	CO3	Know understand the basic components of anatomy and physiology of animal with special reference to human

<b>Course Outcomes Semester-II B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Human Anatomy and Physiology – II 13PH0201	CO1	Explain the gross morphology, structure and functions of various organs of the human body.
	CO2	Describe the various homeostatic mechanisms and their imbalances.
	CO3	Identify the various tissues and organs of different systems of human body.
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Computer Applications in Pharmacy 13PH0204	CO1	Know the various types of application of computers in pharmacy
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	CO3	Know the various applications of databases in pharmacy

<b>Course Outcomes Semester-III B. Pharm</b>		
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Pharmaceutical Organic Chemistry - II 13PH0301	CO1	The syllabus emphasizes on mechanisms and orientation of reactions.
	CO2	This subject deals with general methods of preparation and reactions of some organic compounds.
	CO3	Reactivity of organic compounds are also studied here.
	CO4	Chemistry of fats and oils are also included in the syllabus.
Physical Pharmaceutics – I 13PH0302	CO1	Understand various physicochemical properties of drug molecules in the designing the dosage forms
	CO2	Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
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	CO2	Understand the metabolism of nutrient molecules in physiological and pathological conditions
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	CO3	Mention the complications of the diseases
Pharmacognosy and Phytochemistry -I 13PH0305	CO1	To understand the techniques in the cultivation and production of crude drugs
	CO2	To describe the crude drugs, their uses and chemical nature
	CO3	To explain the evaluation techniques for the herbal drugs
	CO4	To analyse the microscopic and morphological evaluation of crude drugs

<b>Course Outcomes Semester-IV B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Pharmaceutical Organic Chemistry - III 13PH0401	CO1	understand the methods of preparation and properties of organic compounds
	CO2	explain the stereo chemical aspects of organic compounds and stereo chemical reactions
	CO3	know the medicinal uses and other applications of organic compounds
Medicinal Chemistry - I 13PH0402	CO1	Able to know the chemistry of drugs with respect to their Pharmacological activity
	CO2	Know the drug metabolic pathways, adverse effect and therapeutic value of drugs
	CO3	Know the Structural Activity Relationship (SAR) of different class of drugs
Physical Pharmaceutics - II 13PH0403	CO1	Understand various physicochemical properties of drug molecules in the designing the dosage forms

	CO2	Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
	CO3	Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms
Pharmacology - I 13PH0404	CO1	Understand the pharmacological actions of different categories of drugs
	CO2	Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels
	CO3	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases
	CO4	Observe the effect of drugs on animals by simulated experiments
	CO5	Appreciate correlation of pharmacology with other bio medical sciences
	CO6	Understanding of general pharmacology concepts
Pharmaceutical Jurisprudence 13PH0405	CO1	To understand the Pharmaceutical legislation and their implications in the development and marketing of pharmaceuticals.
	CO2	To Understand Various Indian pharmaceutical Acts and Laws
	CO3	To study the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
	CO4	To study the code of ethics during the pharmaceutical practice.

<b>Course Outcomes Semester-V B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Medicinal Chemistry - II 13PH0501	CO1	To study the chemistry of drugs with respect to their pharmacological activity
	CO2	Know the drug metabolic pathways, adverse effect and therapeutic value of drugs
	CO3	To understand the Structural Activity Relationship of different class of drugs
	CO4	Understanding of the basic biological and pharmacological interactions by using both natural products and synthetic molecules
	CO5	Able to write the chemical synthesis of selected drugs
Pharmacology - II 13PH0502	CO1	Upon completion of the course, the student shall be able to understand the mechanism of drug action and its relevance in the treatment of different diseases.
	CO2	Demonstrate the isolation of different organs/tissues from the laboratory animals by simulated experiments.
	CO3	Demonstrate the various receptor actions using isolated tissue preparation.
	CO4	Appreciate correlation of pharmacology with related medical sciences
Pharmacognosy and Phytochemistry - II 13PH0503	CO1	To know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
	CO2	To understand the preparation and development of herbal formulation

	CO3	To understand the herbal drug interactions
	CO4	To carryout isolation and identification of phyto-constituents
Pharmaceutical Microbiology 13PH0504	CO1	Understand methods of identification, cultivation and preservation of various microorganisms
	CO2	To understand the importance and implementation of sterilization in pharmaceutical processing and industry
	CO3	Learn sterility testing of pharmaceutical products
	CO4	Understand the cell culture technology and its applications in pharmaceutical industries
	CO5	Carried out microbiological standardization of Pharmaceuticals.
Pharmaceutical Biotechnology 13PH0505	CO1	Understanding the importance of Immobilized enzymes in Pharmaceutical Industries
	CO2	Genetic engineering applications in relation to production of pharmaceuticals.
	CO3	Importance of Monoclonal antibodies in Industries.
	CO4	Appreciate the use of microorganisms in fermentation technology.

<b>Course Outcomes Semester-VI B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Medicinal Chemistry - III 13PH0601	CO1	Understand the importance of drug design and different techniques of drug design.
	CO2	Understand the chemistry of drugs with respect to their biological activity.
	CO3	Know the metabolism, adverse effects and therapeutic value of drugs.
	CO4	Know the importance of SAR of drugs
Pharmacology - III 13PH0602	CO1	Understand the mechanism of drug action and its relevance in the treatment of respiratory, digestive and infectious diseases
	CO2	Comprehend the principles of toxicology and treatment of various poisonings
	CO3	Appreciate the correlation of pharmacology with related medical sciences
Herbal Drug Technology 13PH0603	CO1	Understand raw material as a source of herbal drugs from cultivation to herbal drug product
	CO2	Know the WHO and ICH guidelines for the evaluation of herbal drugs.
	CO3	Know the herbal cosmetics, natural sweeteners, nutraceuticals.
	CO4	Appreciate patenting of herbal drugs, GMP.
Biopharmaceutics and Pharmacokinetics 13PH0604	CO1	Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance.
	CO2	Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination.
	CO3	To understand the concepts of bioavailability and bioequivalence of drug products and their significance.
	CO4	Understand various pharmacokinetic parameters, their significance & applications.
Industrial Pharmacy - I	CO1	Know the various pharmaceutical dosage forms

13PH0605		and their manufacturing Techniques.
	CO2	Know various considerations in the development of pharmaceutical dosage forms.
	CO3	Formulate solid, liquid, and semisolid dosage forms and evaluate them for their quality.

<b>Course Outcomes Semester-VII B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Instrumental Methods of Analysis 13PH0701	CO1	To understand the interaction of matter with electromagnetic radiations and its applications in drug analysis
	CO2	To understand the chromatographic separation and analysis of drugs
	CO3	Perform quantitative & qualitative analysis of drugs using various analytical instruments.
Industrial Pharmacy - II 13PH0702	CO1	Know the process of pilot plant and scale-up of pharmaceutical dosage forms.
	CO2	Understand the process of technology transfer from lab scale to commercial batch.
	CO3	Know different Laws and Acts that regulate the pharmaceutical industry.
	CO4	Understand the approval process and regulatory requirements for drug products.
Pharmacy Practice 13PH0703	CO1	Know about Hospital and its organization, hospital & community Pharmacy, detect, assess and report adverse drug reactions.
	CO2	Know various drug distribution methods in a hospital, hospital formulary, therapeutic drug monitoring, medication adherence and able to do medication history interview and counsel the patients
	CO3	Know the functions of Therapeutic Drug Committee, role of pharmacist in education and training, do patient counselling in community pharmacy & communication skills of a pharmacist (with prescribers & patients)
	CO4	Know pharmaceutical care services, monitor drug therapy through medication chart review/clinical review, role of clinical pharmacist, appreciate the concept of rational use of OTC drugs
	CO5	Appreciate the pharmacy stores management and inventory control, interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states.
Novel Drug Delivery Systems 13PH0704	CO1	To understand various approaches for the development of novel drug delivery systems.
	CO2	To understand the criteria for the selection of drugs and polymers for the development of novel drug delivery systems, their formulation and evaluation.
Quality Assurance 13PH0705	CO1	Understand the cGMP aspects in a pharmaceutical industry.
	CO2	Appreciate the importance of documentation.
	CO3	Understand the scope of quality certifications applicable to pharmaceutical industries.
	CO4	Understand the responsibilities of QA & QC departments.
Practice School report 13PH0706	CO1	Provide opportunity for the students to enhance their knowledge and technical skills required for

		various pharmaceutical jobs
	CO2	Ignite scientific temper through collaborative and integrated learning under the guidance of professionals
	CO3	Develop skills required for scientific literature review, finding research gaps, etc
	CO4	Understand of how the concepts learned in the classroom will be applicable in the real-life scenario
	CO5	Sensitize students to the expectation of the work environment, their strengths and weaknesses.

<b>Course Outcomes Semester-VIII B. Pharm</b>		
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Biostatistics and Research Methodology 13PH0801	CO1	Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment).
	CO2	Know the various statistical techniques to solve statistical problems.
	CO3	Appreciate statistical techniques in solving the problems.
Social and Preventive Pharmacy 13PH0802	CO1	Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.
	CO2	Have a critical way of thinking based on current healthcare development.
	CO3	Evaluate alternative ways of solving problems related to health and pharmaceutical issues.
Pharma Marketing Management 13PH0803	CO1	Understand general concepts and scope of marketing, Consumer & Industry buying buying behaviour, Market research, prescribing motivation
	CO2	Understanding of concepts related to product line, product mix decisions, product life cycle, portfolio analysis; product positioning
	CO3	Understanding of concepts relating to methods of product promotion
	CO4	Understanding of pharmaceutical marketing channels & role of professional sales representative
	CO5	Understanding of pricing methods and strategies, issues in price management in the pharmaceutical industry
Pharmaceutical Regulatory Science 13PH0804	CO1	Know about the process of drug discovery and development.
	CO2	Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals.
	CO3	Know the regulatory approval process and their registration in Indian and international markets.
Pharmacovigilance 13PH0805	CO1	History, national and international scenario, importance of safety monitoring
	CO2	Dictionaries, coding, detection and reporting of adverse drug reaction and their assessment
	CO3	classification of disease and drugs, methods to generate safety data, evaluation of drug safety in special population
	CO4	Pharmacovigilance Program of India (PvPI) requirement for ADR reporting in India.
	CO5	ICH guidelines for ICSR, PSUR, expedited

		reporting, pharmacovigilance planning and CIOMS requirements for ADR reporting.
	CO6	Writing case narratives of adverse events and their quality.
Quality Control and Standardization of Herbals 13PH0806	CO1	Know WHO guidelines for quality control of herbal drugs.
	CO2	Know Quality assurance in the herbal drug industry.
	CO3	Know the regulatory approval process and their registration in Indian and international markets.
	CO4	Appreciate EU and ICH guidelines for quality control of herbal drugs.
Computer-Aided Drug Design 13PH0807	CO1	Design and discovery of lead molecules.
	CO2	The role of drug design in the drug discovery process.
	CO3	The concept of QSAR and docking.
	CO4	Various strategies to develop a new drug-like molecule.
	CO5	The design of new drug molecules using molecular modelling software.
Cell and Molecular Biology 13PH0808	CO1	Understand cell and molecular biology history.
	CO2	understand composition, cellular functioning and chemical foundations of cell biology.
	CO3	understand protein structure, cell structure and its function.
	CO4	understand DNA properties, cell cycle and basic molecular genetics
Cosmetic Science 13PH0809	CO1	Know the regulations about cosmetics and cosmetic excipients.
	CO2	know the preparations of various skincare products like creams, antiperspirants, deodorants, hair care products etc.
	CO3	know about the role of herbs in sunscreens.
Experimental Pharmacology 13PH0810	CO1	Appreciate the applications of various commonly used laboratory animals.
	CO2	Appreciate and demonstrate the various screening methods used in preclinical research.
	CO3	Appreciate and demonstrate the importance of biostatistics and research methodology.
	CO4	Design and execute a research hypothesis independently.
Advanced Instrumentation Techniques 13PH0811	CO1	Understand the advanced instrument used and its applications in drug analysis.
	CO2	Understand the chromatographic separation and analysis of the drug.
	CO3	Understand the calibration of various analytical instruments.
	CO4	Know analysis of drugs using various analytical instruments.
Dietary Supplements and Nutraceuticals 13PH0812	CO1	Understand the need for supplements by the different groups of people to maintain a healthy life.
	CO2	Understand the outcome of deficiencies in dietary supplements.
	CO3	Appreciate the components in dietary supplements and their application.
	CO4	Appreciate the regulatory and commercial aspects of dietary supplements including health claims.
Project Work	CO1	Provide an opportunity to explore the area of



13PH0813		interest
	CO2	Develop the technical skills required for research work
	CO3	Develop skills required for literature review, finding research gaps, and writing a scientific report of minor research project



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**PO 2:** Domain knowledge of the field:

The students will be able to learn and acquire adequate knowledge, and necessary skills to practice the pharmacy profession. They will acquire knowledge and scientific information regarding basic principles of Pharmacology, Pharmaceutical, Medicinal Chemistry, Pharmaceutics, Pharmacognosy, Clinical Pharmacy, herbal medicines, and related undergraduate subjects.

**PO 3:** Professional skills required for pharmacy:

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<b>Subject with code</b>		<b>Course Outcome</b>
Pharmaceutical Organic Chemistry - III 13PH0401	CO1	understand the methods of preparation and properties of organic compounds
	CO2	explain the stereo chemical aspects of organic compounds and stereo chemical reactions
	CO3	know the medicinal uses and other applications of organic compounds
Medicinal Chemistry - I 13PH0402	CO1	Able to know the chemistry of drugs with respect to their Pharmacological activity
	CO2	Know the drug metabolic pathways, adverse effect and therapeutic value of drugs
	CO3	Know the Structural Activity Relationship (SAR) of different class of drugs
Physical Pharmaceutics - II 13PH0403	CO1	Understand various physicochemical properties of drug molecules in the designing the dosage forms

	CO2	Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
	CO3	Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms
Pharmacology - I 13PH0404	CO1	Understand the pharmacological actions of different categories of drugs
	CO2	Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels
	CO3	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases
	CO4	Observe the effect of drugs on animals by simulated experiments
	CO5	Appreciate correlation of pharmacology with other bio medical sciences
	CO6	Understanding of general pharmacology concepts
Pharmaceutical Jurisprudence 13PH0405	CO1	To understand the Pharmaceutical legislation and their implications in the development and marketing of pharmaceuticals.
	CO2	To Understand Various Indian pharmaceutical Acts and Laws
	CO3	To study the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
	CO4	To study the code of ethics during the pharmaceutical practice.

<b>Course Outcomes Semester-V B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Medicinal Chemistry - II 13PH0501	CO1	To study the chemistry of drugs with respect to their pharmacological activity
	CO2	Know the drug metabolic pathways, adverse effect and therapeutic value of drugs
	CO3	To understand the Structural Activity Relationship of different class of drugs
	CO4	Understanding of the basic biological and pharmacological interactions by using both natural products and synthetic molecules
	CO5	Able to write the chemical synthesis of selected drugs
Pharmacology - II 13PH0502	CO1	Upon completion of the course, the student shall be able to understand the mechanism of drug action and its relevance in the treatment of different diseases.
	CO2	Demonstrate the isolation of different organs/tissues from the laboratory animals by simulated experiments.
	CO3	Demonstrate the various receptor actions using isolated tissue preparation.
	CO4	Appreciate correlation of pharmacology with related medical sciences
Pharmacognosy and Phytochemistry - II 13PH0503	CO1	To know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
	CO2	To understand the preparation and development of herbal formulation

	CO3	To understand the herbal drug interactions
	CO4	To carryout isolation and identification of phyto-constituents
Pharmaceutical Microbiology 13PH0504	CO1	Understand methods of identification, cultivation and preservation of various microorganisms
	CO2	To understand the importance and implementation of sterilization in pharmaceutical processing and industry
	CO3	Learn sterility testing of pharmaceutical products
	CO4	Understand the cell culture technology and its applications in pharmaceutical industries
	CO5	Carried out microbiological standardization of Pharmaceuticals.
Pharmaceutical Biotechnology 13PH0505	CO1	Understanding the importance of Immobilized enzymes in Pharmaceutical Industries
	CO2	Genetic engineering applications in relation to production of pharmaceuticals.
	CO3	Importance of Monoclonal antibodies in Industries.
	CO4	Appreciate the use of microorganisms in fermentation technology.

<b>Course Outcomes Semester-VI B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Medicinal Chemistry - III 13PH0601	CO1	Understand the importance of drug design and different techniques of drug design.
	CO2	Understand the chemistry of drugs with respect to their biological activity.
	CO3	Know the metabolism, adverse effects and therapeutic value of drugs.
	CO4	Know the importance of SAR of drugs
Pharmacology - III 13PH0602	CO1	Understand the mechanism of drug action and its relevance in the treatment of respiratory, digestive and infectious diseases
	CO2	Comprehend the principles of toxicology and treatment of various poisonings
	CO3	Appreciate the correlation of pharmacology with related medical sciences
Herbal Drug Technology 13PH0603	CO1	Understand raw material as a source of herbal drugs from cultivation to herbal drug product
	CO2	Know the WHO and ICH guidelines for the evaluation of herbal drugs.
	CO3	Know the herbal cosmetics, natural sweeteners, nutraceuticals.
	CO4	Appreciate patenting of herbal drugs, GMP.
Biopharmaceutics and Pharmacokinetics 13PH0604	CO1	Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance.
	CO2	Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination.
	CO3	To understand the concepts of bioavailability and bioequivalence of drug products and their significance.
	CO4	Understand various pharmacokinetic parameters, their significance & applications.
Industrial Pharmacy - I	CO1	Know the various pharmaceutical dosage forms

13PH0605		and their manufacturing Techniques.
	CO2	Know various considerations in the development of pharmaceutical dosage forms.
	CO3	Formulate solid, liquid, and semisolid dosage forms and evaluate them for their quality.

<b>Course Outcomes Semester-VII B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Instrumental Methods of Analysis 13PH0701	CO1	To understand the interaction of matter with electromagnetic radiations and its applications in drug analysis
	CO2	To understand the chromatographic separation and analysis of drugs
	CO3	Perform quantitative & qualitative analysis of drugs using various analytical instruments.
Industrial Pharmacy - II 13PH0702	CO1	Know the process of pilot plant and scale-up of pharmaceutical dosage forms.
	CO2	Understand the process of technology transfer from lab scale to commercial batch.
	CO3	Know different Laws and Acts that regulate the pharmaceutical industry.
	CO4	Understand the approval process and regulatory requirements for drug products.
Pharmacy Practice 13PH0703	CO1	Know about Hospital and its organization, hospital & community Pharmacy, detect, assess and report adverse drug reactions.
	CO2	Know various drug distribution methods in a hospital, hospital formulary, therapeutic drug monitoring, medication adherence and able to do medication history interview and counsel the patients
	CO3	Know the functions of Therapeutic Drug Committee, role of pharmacist in education and training, do patient counselling in community pharmacy & communication skills of a pharmacist (with prescribers & patients)
	CO4	Know pharmaceutical care services, monitor drug therapy through medication chart review/clinical review, role of clinical pharmacist, appreciate the concept of rational use of OTC drugs
	CO5	Appreciate the pharmacy stores management and inventory control, interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states.
Novel Drug Delivery Systems 13PH0704	CO1	To understand various approaches for the development of novel drug delivery systems.
	CO2	To understand the criteria for the selection of drugs and polymers for the development of novel drug delivery systems, their formulation and evaluation.
Quality Assurance 13PH0705	CO1	Understand the cGMP aspects in a pharmaceutical industry.
	CO2	Appreciate the importance of documentation.
	CO3	Understand the scope of quality certifications applicable to pharmaceutical industries.
	CO4	Understand the responsibilities of QA & QC departments.
Practice School report 13PH0706	CO1	Provide opportunity for the students to enhance their knowledge and technical skills required for

		various pharmaceutical jobs
	CO2	Ignite scientific temper through collaborative and integrated learning under the guidance of professionals
	CO3	Develop skills required for scientific literature review, finding research gaps, etc
	CO4	Understand of how the concepts learned in the classroom will be applicable in the real-life scenario
	CO5	Sensitize students to the expectation of the work environment, their strengths and weaknesses.

<b>Course Outcomes Semester-VIII B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Biostatistics and Research Methodology 13PH0801	CO1	Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment).
	CO2	Know the various statistical techniques to solve statistical problems.
	CO3	Appreciate statistical techniques in solving the problems.
Social and Preventive Pharmacy 13PH0802	CO1	Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.
	CO2	Have a critical way of thinking based on current healthcare development.
	CO3	Evaluate alternative ways of solving problems related to health and pharmaceutical issues.
Pharma Marketing Management 13PH0803	CO1	Understand general concepts and scope of marketing, Consumer & Industry buying buying behaviour, Market research, prescribing motivation
	CO2	Understanding of concepts related to product line, product mix decisions, product life cycle, portfolio analysis; product positioning
	CO3	Understanding of concepts relating to methods of product promotion
	CO4	Understanding of pharmaceutical marketing channels & role of professional sales representative
	CO5	Understanding of pricing methods and strategies, issues in price management in the pharmaceutical industry
Pharmaceutical Regulatory Science 13PH0804	CO1	Know about the process of drug discovery and development.
	CO2	Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals.
	CO3	Know the regulatory approval process and their registration in Indian and international markets.
Pharmacovigilance 13PH0805	CO1	History, national and international scenario, importance of safety monitoring
	CO2	Dictionaries, coding, detection and reporting of adverse drug reaction and their assessment
	CO3	classification of disease and drugs, methods to generate safety data, evaluation of drug safety in special population
	CO4	Pharmacovigilance Program of India (PvPI) requirement for ADR reporting in India.
	CO5	ICH guidelines for ICSR, PSUR, expedited

		reporting, pharmacovigilance planning and CIOMS requirements for ADR reporting.
	CO6	Writing case narratives of adverse events and their quality.
Quality Control and Standardization of Herbals 13PH0806	CO1	Know WHO guidelines for quality control of herbal drugs.
	CO2	Know Quality assurance in the herbal drug industry.
	CO3	Know the regulatory approval process and their registration in Indian and international markets.
	CO4	Appreciate EU and ICH guidelines for quality control of herbal drugs.
Computer-Aided Drug Design 13PH0807	CO1	Design and discovery of lead molecules.
	CO2	The role of drug design in the drug discovery process.
	CO3	The concept of QSAR and docking.
	CO4	Various strategies to develop a new drug-like molecule.
	CO5	The design of new drug molecules using molecular modelling software.
Cell and Molecular Biology 13PH0808	CO1	Understand cell and molecular biology history.
	CO2	understand composition, cellular functioning and chemical foundations of cell biology.
	CO3	understand protein structure, cell structure and its function.
	CO4	understand DNA properties, cell cycle and basic molecular genetics
Cosmetic Science 13PH0809	CO1	Know the regulations about cosmetics and cosmetic excipients.
	CO2	know the preparations of various skincare products like creams, antiperspirants, deodorants, hair care products etc.
	CO3	know about the role of herbs in sunscreens.
Experimental Pharmacology 13PH0810	CO1	Appreciate the applications of various commonly used laboratory animals.
	CO2	Appreciate and demonstrate the various screening methods used in preclinical research.
	CO3	Appreciate and demonstrate the importance of biostatistics and research methodology.
	CO4	Design and execute a research hypothesis independently.
Advanced Instrumentation Techniques 13PH0811	CO1	Understand the advanced instrument used and its applications in drug analysis.
	CO2	Understand the chromatographic separation and analysis of the drug.
	CO3	Understand the calibration of various analytical instruments.
	CO4	Know analysis of drugs using various analytical instruments.
Dietary Supplements and Nutraceuticals 13PH0812	CO1	Understand the need for supplements by the different groups of people to maintain a healthy life.
	CO2	Understand the outcome of deficiencies in dietary supplements.
	CO3	Appreciate the components in dietary supplements and their application.
	CO4	Appreciate the regulatory and commercial aspects of dietary supplements including health claims.
Project Work	CO1	Provide an opportunity to explore the area of

13PH0813		interest
	CO2	Develop the technical skills required for research work
	CO3	Develop skills required for literature review, finding research gaps, and writing a scientific report of minor research project



# B. Pharm

Bachelor of Pharmacy (B. Pharm)  
Batch 2020-23  
**Program Outcomes (PO)**



**Marwadi University Rajkot**



Students of all undergraduate pharmacy degree programs at the time of graduation will be able to learn:

**PO 1:** Patient counselling and community service:

The students will be able to acquire adequate knowledge of patient counselling and drug interactions and utilize and share this knowledge with practitioners for the betterment of health in society. Students will be able to continuously upgrade professional information and be conversant with the latest advances in the field of pharmacy to serve the community better.

**PO 2:** Domain knowledge of the field:

The students will be able to learn and acquire adequate knowledge, and necessary skills to practice the pharmacy profession. They will acquire knowledge and scientific information regarding basic principles of Pharmacology, Pharmaceutical, Medicinal Chemistry, Pharmaceutics, Pharmacognosy, Clinical Pharmacy, herbal medicines, and related undergraduate subjects.

**PO 3:** Professional skills required for pharmacy:

Students will be able to demonstrate skills necessary for the practice of a Pharmacy profession viz. synthesis and analysis of medicinal agents, prescription analysis, quality assurance, and regulatory aspects, manufacturing, and storage of pharmaceutical products, and screening of various medicinal agents using animal models for pharmacological activity.

**PO 4:** Acquire practical skills:

Students will be able to learn practical aspects of APIs synthesis and analyze various pharmaceutical dosage forms as per standards of official books (e.g., WHO, USFDA, MHRA). They will learn pharmacological screening and biological standardization and in-vivo drug interactions, extraction of medicinal plants, the importance of various herbal formulations, Product detailing, marketing, distribution, and selling of pharmaceutical products.

**PO 5:** Professional assistance to physicians and marketing skills:

They will be able to explain and assist the physicians with prescription analysis and drug interaction. They will also be able to market the medicinal agents for diagnosis, prevention, and therapeutic purposes.

**PO 6:** Formulations and manufacturing of drugs:

The students will acquire in-depth knowledge of formulation, quality assurance, and storage of various pharmaceutical dosage forms including herbal medicines. The students will be able to understand the concept of community pharmacy and be able to participate in health care programs.

**PO 7:** Community pharmacy and social responsibility:

Students will be able to apply the current knowledge of Pharmacy in the best interest of the patients and the community by maintaining high standards of professional ethics.



# B. Pharm

Bachelor of Pharmacy (B. Pharm)  
Batch 2020-23  
**Program Specific Outcomes (PSO)**



## Marwadi University Rajkot

Students after the completion of graduation in degree pharmacy programs able to:

**PSO 1:** To impart theoretical knowledge in Pharmaceutics, Pharmaceutical Chemistry, Pharmacology, Pharmacognosy fields as well as practical training and skills development among students through industrial training and research to meet the challenges of the pharmaceutical field

**PSO 2:** Capable to work in a diverse environment on various projects related to pharmaceutical research in the context of developing technologies in various disciplines as well as regulatory aspects of pharmaceuticals.

**PSO 3:** To prepare students for future jobs in Hospital Pharmacy, CHCs (Community Health Centres), District Hospitals, Tertiary & Teaching Hospitals, other public sector hospitals] and Clinical Pharmacy etc. and develop entrepreneurship skills.



# B. Pharm

Bachelor of Pharmacy (B. Pharm)  
Batch 2020-23  
**Course Outcomes (CO)**



**Marwadi University Rajkot**

Students of all undergraduate pharmacy degree programs at the time of graduation will be able to learn:

<b>Course Outcomes Semester-I B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Human Anatomy and Physiology – I 13PH0101	CO1	Explain the gross morphology, structure and functions of various organs of the human body.
	CO2	Describe the various homeostatic mechanisms and their imbalances.
	CO3	Identify the various tissues and organs of different systems of human body.
	CO4	Perform the various experiments related to special senses and nervous system.
	CO5	Appreciate coordinated working pattern of different organs of each system.
Pharmaceutical Analysis 13PH0102	CO1	To understand the principles of Volumetric and electro chemical analysis
	CO2	To carryout various volumetric and electrochemical titrations
	CO3	To develop analytical skills
	CO4	To understand working of analytical instruments
Pharmaceutics - I 13PH0103	CO1	Know the history of profession of pharmacy
	CO2	Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations
	CO3	Understand the professional way of handling the prescription
	CO4	Preparation of various conventional dosage forms
Pharmaceutical Inorganic Chemistry 13PH0104	CO1	know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals
	CO2	understand the medicinal and pharmaceutical importance of inorganic compounds
	CO3	Able to know the properties and medicinal uses of inorganic compounds
	CO4	Understand the assay of inorganic drugs and pharmaceuticals
	CO5	Understand the concept related to acid and base.
Communication Skills 13CS0105	CO1	To understand the behavioural needs for a pharmacist to function effectively in the areas of pharmaceutical operation
	CO2	Enable to communicate effectively (verbal & non-verbal)
	CO3	Able to effectively manage the team as a team player
	CO4	To trained for interview
	CO5	Able to develop leadership qualities and essentials
Remedial Mathematics 13MA101	CO1	This is an introductory course in mathematics. This subject deals with the introduction to Partial fraction, Logarithm, matrices and Determinant, Analytical geometry, Calculus, differential equation and Laplace transform
	CO2	Understand matrices and Determinant
	CO3	Analytical geometry, Calculus, differential equation and Laplace transform
Remedial Biology 13BI0101	CO1	Know the classification and salient feature of five kingdoms of life

	CO2	understand the basic components of anatomy and physiology of plant
	CO3	Know understand the basic components of anatomy and physiology of animal with special reference to human

<b>Course Outcomes Semester-II B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Human Anatomy and Physiology – II 13PH0201	CO1	Explain the gross morphology, structure and functions of various organs of the human body.
	CO2	Describe the various homeostatic mechanisms and their imbalances.
	CO3	Identify the various tissues and organs of different systems of human body.
	CO4	Perform the hematological tests like blood cell counts, hemoglobin estimation, bleeding/clotting time etc. and also record blood pressure, heart rate, pulse and respiratory volume.
	CO5	Appreciate coordinated working pattern of different organs of each system
	CO6	Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.
Pharmaceutical Organic Chemistry - I 13PH0202	CO1	Write the structure, name and the type of isomerism of the organic compound
	CO2	Write the reaction, name the reaction and orientation of reactions
	CO3	Account for reactivity/stability of compounds
	CO4	Identify/confirm the identification of organic compound
Pharmaceutical Engineering 13PH0203	CO1	To know various unit operations used in pharmaceutical industries
	CO2	To understand the material handling techniques
	CO3	To perform various processes involved in pharmaceutical manufacturing process.
	CO4	To carry out various test to prevent environmental pollution
	CO5	To appreciate and comprehend significance of plant lay out design for optimum use of resources.
	CO6	To appreciate the various preventive methods used for corrosion control in pharmaceutical industries
Environmental Sciences 13EN0201	CO1	Create the awareness about environmental problems among learners
	CO2	Impart basic knowledge about the environment and its allied problem
	CO3	develop an attitude of concern for the environment
	CO4	Motivate learner to participate in environment protection and environment improvement
	CO5	acquire skills to help the concerned individuals in identifying and solving environmental problems
	CO6	strive to attain harmony with nature
Computer Applications in Pharmacy 13PH0204	CO1	Know the various types of application of computers in pharmacy
	CO2	Know the various types of databases
	CO3	Know the various applications of databases in pharmacy

<b>Course Outcomes Semester-III B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Pharmaceutical Organic Chemistry - II 13PH0301	CO1	The syllabus emphasizes on mechanisms and orientation of reactions.
	CO2	This subject deals with general methods of preparation and reactions of some organic compounds.
	CO3	Reactivity of organic compounds are also studied here.
	CO4	Chemistry of fats and oils are also included in the syllabus.
Physical Pharmaceutics – I 13PH0302	CO1	Understand various physicochemical properties of drug molecules in the designing the dosage forms
	CO2	Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
	CO3	Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.
Biochemistry 13PH0303	CO1	Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes
	CO2	Understand the metabolism of nutrient molecules in physiological and pathological conditions
	CO3	Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins
Pathophysiology 13PH0304	CO1	Describe the etiology and pathogenesis of the selected disease states
	CO2	Name the signs and symptoms of the diseases
	CO3	Mention the complications of the diseases
Pharmacognosy and Phytochemistry -I 13PH0305	CO1	To understand the techniques in the cultivation and production of crude drugs
	CO2	To describe the crude drugs, their uses and chemical nature
	CO3	To explain the evaluation techniques for the herbal drugs
	CO4	To analyse the microscopic and morphological evaluation of crude drugs

<b>Course Outcomes Semester-IV B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Pharmaceutical Organic Chemistry - III 13PH0401	CO1	understand the methods of preparation and properties of organic compounds
	CO2	explain the stereo chemical aspects of organic compounds and stereo chemical reactions
	CO3	know the medicinal uses and other applications of organic compounds
Medicinal Chemistry - I 13PH0402	CO1	Able to know the chemistry of drugs with respect to their Pharmacological activity
	CO2	Know the drug metabolic pathways, adverse effect and therapeutic value of drugs
	CO3	Know the Structural Activity Relationship (SAR) of different class of drugs
Physical Pharmaceutics - II 13PH0403	CO1	Understand various physicochemical properties of drug molecules in the designing the dosage forms

	CO2	Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
	CO3	Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms
Pharmacology - I 13PH0404	CO1	Understand the pharmacological actions of different categories of drugs
	CO2	Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels
	CO3	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases
	CO4	Observe the effect of drugs on animals by simulated experiments
	CO5	Appreciate correlation of pharmacology with other bio medical sciences
	CO6	Understanding of general pharmacology concepts
Pharmaceutical Jurisprudence 13PH0405	CO1	To understand the Pharmaceutical legislation and their implications in the development and marketing of pharmaceuticals.
	CO2	To Understand Various Indian pharmaceutical Acts and Laws
	CO3	To study the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
	CO4	To study the code of ethics during the pharmaceutical practice.

<b>Course Outcomes Semester-V B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Medicinal Chemistry - II 13PH0501	CO1	To study the chemistry of drugs with respect to their pharmacological activity
	CO2	Know the drug metabolic pathways, adverse effect and therapeutic value of drugs
	CO3	To understand the Structural Activity Relationship of different class of drugs
	CO4	Understanding of the basic biological and pharmacological interactions by using both natural products and synthetic molecules
	CO5	Able to write the chemical synthesis of selected drugs
Pharmacology - II 13PH0502	CO1	Upon completion of the course, the student shall be able to understand the mechanism of drug action and its relevance in the treatment of different diseases.
	CO2	Demonstrate the isolation of different organs/tissues from the laboratory animals by simulated experiments.
	CO3	Demonstrate the various receptor actions using isolated tissue preparation.
	CO4	Appreciate correlation of pharmacology with related medical sciences
Pharmacognosy and Phytochemistry - II 13PH0503	CO1	To know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
	CO2	To understand the preparation and development of herbal formulation



	CO3	To understand the herbal drug interactions
	CO4	To carryout isolation and identification of phyto-constituents
Pharmaceutical Microbiology 13PH0504	CO1	Understand methods of identification, cultivation and preservation of various microorganisms
	CO2	To understand the importance and implementation of sterilization in pharmaceutical processing and industry
	CO3	Learn sterility testing of pharmaceutical products
	CO4	Understand the cell culture technology and its applications in pharmaceutical industries
	CO5	Carried out microbiological standardization of Pharmaceuticals.
Pharmaceutical Biotechnology 13PH0505	CO1	Understanding the importance of Immobilized enzymes in Pharmaceutical Industries
	CO2	Genetic engineering applications in relation to production of pharmaceuticals.
	CO3	Importance of Monoclonal antibodies in Industries.
	CO4	Appreciate the use of microorganisms in fermentation technology.

<b>Course Outcomes Semester-VI B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Medicinal Chemistry - III 13PH0601	CO1	Understand the importance of drug design and different techniques of drug design.
	CO2	Understand the chemistry of drugs with respect to their biological activity.
	CO3	Know the metabolism, adverse effects and therapeutic value of drugs.
	CO4	Know the importance of SAR of drugs
Pharmacology - III 13PH0602	CO1	Understand the mechanism of drug action and its relevance in the treatment of respiratory, digestive and infectious diseases
	CO2	Comprehend the principles of toxicology and treatment of various poisonings
	CO3	Appreciate the correlation of pharmacology with related medical sciences
Herbal Drug Technology 13PH0603	CO1	Understand raw material as a source of herbal drugs from cultivation to herbal drug product
	CO2	Know the WHO and ICH guidelines for the evaluation of herbal drugs.
	CO3	Know the herbal cosmetics, natural sweeteners, nutraceuticals.
	CO4	Appreciate patenting of herbal drugs, GMP.
Biopharmaceutics and Pharmacokinetics 13PH0604	CO1	Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance.
	CO2	Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination.
	CO3	To understand the concepts of bioavailability and bioequivalence of drug products and their significance.
	CO4	Understand various pharmacokinetic parameters, their significance & applications.
Industrial Pharmacy - I	CO1	Know the various pharmaceutical dosage forms

13PH0605		and their manufacturing Techniques.
	CO2	Know various considerations in the development of pharmaceutical dosage forms.
	CO3	Formulate solid, liquid, and semisolid dosage forms and evaluate them for their quality.

<b>Course Outcomes Semester-VII B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Instrumental Methods of Analysis 13PH0701	CO1	To understand the interaction of matter with electromagnetic radiations and its applications in drug analysis
	CO2	To understand the chromatographic separation and analysis of drugs
	CO3	Perform quantitative & qualitative analysis of drugs using various analytical instruments.
Industrial Pharmacy - II 13PH0702	CO1	Know the process of pilot plant and scale-up of pharmaceutical dosage forms.
	CO2	Understand the process of technology transfer from lab scale to commercial batch.
	CO3	Know different Laws and Acts that regulate the pharmaceutical industry.
	CO4	Understand the approval process and regulatory requirements for drug products.
Pharmacy Practice 13PH0703	CO1	Know about Hospital and its organization, hospital & community Pharmacy, detect, assess and report adverse drug reactions.
	CO2	Know various drug distribution methods in a hospital, hospital formulary, therapeutic drug monitoring, medication adherence and able to do medication history interview and counsel the patients
	CO3	Know the functions of Therapeutic Drug Committee, role of pharmacist in education and training, do patient counselling in community pharmacy & communication skills of a pharmacist (with prescribers & patients)
	CO4	Know pharmaceutical care services, monitor drug therapy through medication chart review/clinical review, role of clinical pharmacist, appreciate the concept of rational use of OTC drugs
	CO5	Appreciate the pharmacy stores management and inventory control, interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states.
Novel Drug Delivery Systems 13PH0704	CO1	To understand various approaches for the development of novel drug delivery systems.
	CO2	To understand the criteria for the selection of drugs and polymers for the development of novel drug delivery systems, their formulation and evaluation.
Quality Assurance 13PH0705	CO1	Understand the cGMP aspects in a pharmaceutical industry.
	CO2	Appreciate the importance of documentation.
	CO3	Understand the scope of quality certifications applicable to pharmaceutical industries.
	CO4	Understand the responsibilities of QA & QC departments.
Practice School report 13PH0706	CO1	Provide opportunity for the students to enhance their knowledge and technical skills required for

		various pharmaceutical jobs
	CO2	Ignite scientific temper through collaborative and integrated learning under the guidance of professionals
	CO3	Develop skills required for scientific literature review, finding research gaps, etc
	CO4	Understand of how the concepts learned in the classroom will be applicable in the real-life scenario
	CO5	Sensitize students to the expectation of the work environment, their strengths and weaknesses.

<b>Course Outcomes Semester-VIII B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Biostatistics and Research Methodology 13PH0801	CO1	Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment).
	CO2	Know the various statistical techniques to solve statistical problems.
	CO3	Appreciate statistical techniques in solving the problems.
Social and Preventive Pharmacy 13PH0802	CO1	Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.
	CO2	Have a critical way of thinking based on current healthcare development.
	CO3	Evaluate alternative ways of solving problems related to health and pharmaceutical issues.
Pharma Marketing Management 13PH0803	CO1	Understand general concepts and scope of marketing, Consumer & Industry buying buying behaviour, Market research, prescribing motivation
	CO2	Understanding of concepts related to product line, product mix decisions, product life cycle, portfolio analysis; product positioning
	CO3	Understanding of concepts relating to methods of product promotion
	CO4	Understanding of pharmaceutical marketing channels & role of professional sales representative
	CO5	Understanding of pricing methods and strategies, issues in price management in the pharmaceutical industry
Pharmaceutical Regulatory Science 13PH0804	CO1	Know about the process of drug discovery and development.
	CO2	Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals.
	CO3	Know the regulatory approval process and their registration in Indian and international markets.
Pharmacovigilance 13PH0805	CO1	History, national and international scenario, importance of safety monitoring
	CO2	Dictionaries, coding, detection and reporting of adverse drug reaction and their assessment
	CO3	classification of disease and drugs, methods to generate safety data, evaluation of drug safety in special population
	CO4	Pharmacovigilance Program of India (PvPI) requirement for ADR reporting in India.
	CO5	ICH guidelines for ICSR, PSUR, expedited

		reporting, pharmacovigilance planning and CIOMS requirements for ADR reporting.
	CO6	Writing case narratives of adverse events and their quality.
Quality Control and Standardization of Herbals 13PH0806	CO1	Know WHO guidelines for quality control of herbal drugs.
	CO2	Know Quality assurance in the herbal drug industry.
	CO3	Know the regulatory approval process and their registration in Indian and international markets.
	CO4	Appreciate EU and ICH guidelines for quality control of herbal drugs.
Computer-Aided Drug Design 13PH0807	CO1	Design and discovery of lead molecules.
	CO2	The role of drug design in the drug discovery process.
	CO3	The concept of QSAR and docking.
	CO4	Various strategies to develop a new drug-like molecule.
	CO5	The design of new drug molecules using molecular modelling software.
Cell and Molecular Biology 13PH0808	CO1	Understand cell and molecular biology history.
	CO2	understand composition, cellular functioning and chemical foundations of cell biology.
	CO3	understand protein structure, cell structure and its function.
	CO4	understand DNA properties, cell cycle and basic molecular genetics
Cosmetic Science 13PH0809	CO1	Know the regulations about cosmetics and cosmetic excipients.
	CO2	know the preparations of various skincare products like creams, antiperspirants, deodorants, hair care products etc.
	CO3	know about the role of herbs in sunscreens.
Experimental Pharmacology 13PH0810	CO1	Appreciate the applications of various commonly used laboratory animals.
	CO2	Appreciate and demonstrate the various screening methods used in preclinical research.
	CO3	Appreciate and demonstrate the importance of biostatistics and research methodology.
	CO4	Design and execute a research hypothesis independently.
Advanced Instrumentation Techniques 13PH0811	CO1	Understand the advanced instrument used and its applications in drug analysis.
	CO2	Understand the chromatographic separation and analysis of the drug.
	CO3	Understand the calibration of various analytical instruments.
	CO4	Know analysis of drugs using various analytical instruments.
Dietary Supplements and Nutraceuticals 13PH0812	CO1	Understand the need for supplements by the different groups of people to maintain a healthy life.
	CO2	Understand the outcome of deficiencies in dietary supplements.
	CO3	Appreciate the components in dietary supplements and their application.
	CO4	Appreciate the regulatory and commercial aspects of dietary supplements including health claims.
Project Work	CO1	Provide an opportunity to explore the area of

13PH0813		interest
	CO2	Develop the technical skills required for research work
	CO3	Develop skills required for literature review, finding research gaps, and writing a scientific report of minor research project



# B. Pharm

Bachelor of Pharmacy (B. Pharm)  
Batch 2021-24  
**Program Outcomes (PO)**



**Marwadi University Rajkot**

Students of all undergraduate pharmacy degree programs at the time of graduation will be able to learn:

**PO 1:** Patient counselling and community service:

The students will be able to acquire adequate knowledge of patient counselling and drug interactions and utilize and share this knowledge with practitioners for the betterment of health in society. Students will be able to continuously upgrade professional information and be conversant with the latest advances in the field of pharmacy to serve the community better.

**PO 2:** Domain knowledge of the field:

The students will be able to learn and acquire adequate knowledge, and necessary skills to practice the pharmacy profession. They will acquire knowledge and scientific information regarding basic principles of Pharmacology, Pharmaceutical, Medicinal Chemistry, Pharmaceutics, Pharmacognosy, Clinical Pharmacy, herbal medicines, and related undergraduate subjects.

**PO 3:** Professional skills required for pharmacy:

Students will be able to demonstrate skills necessary for the practice of a Pharmacy profession viz. synthesis and analysis of medicinal agents, prescription analysis, quality assurance, and regulatory aspects, manufacturing, and storage of pharmaceutical products, and screening of various medicinal agents using animal models for pharmacological activity.

**PO 4:** Acquire practical skills:

Students will be able to learn practical aspects of APIs synthesis and analyze various pharmaceutical dosage forms as per standards of official books (e.g., WHO, USFDA, MHRA). They will learn pharmacological screening and biological standardization and in-vivo drug interactions, extraction of medicinal plants, the importance of various herbal formulations, Product detailing, marketing, distribution, and selling of pharmaceutical products.

**PO 5:** Professional assistance to physicians and marketing skills:

They will be able to explain and assist the physicians with prescription analysis and drug interaction. They will also be able to market the medicinal agents for diagnosis, prevention, and therapeutic purposes.

**PO 6:** Formulations and manufacturing of drugs:

The students will acquire in-depth knowledge of formulation, quality assurance, and storage of various pharmaceutical dosage forms including herbal medicines. The students will be able to understand the concept of community pharmacy and be able to participate in health care programs.

**PO 7:** Community pharmacy and social responsibility:

Students will be able to apply the current knowledge of Pharmacy in the best interest of the patients and the community by maintaining high standards of professional ethics.



# B. Pharm

Bachelor of Pharmacy (B. Pharm)  
Batch 2021-24  
**Program Specific Outcomes (PSO)**



**Marwadi University Rajkot**



Students after the completion of graduation in degree pharmacy programs able to:

**PSO 1:** To impart theoretical knowledge in Pharmaceutics, Pharmaceutical Chemistry, Pharmacology, Pharmacognosy fields as well as practical training and skills development among students through industrial training and research to meet the challenges of the pharmaceutical field

**PSO 2:** Capable to work in a diverse environment on various projects related to pharmaceutical research in the context of developing technologies in various disciplines as well as regulatory aspects of pharmaceuticals.

**PSO 3:** To prepare students for future jobs in Hospital Pharmacy, CHCs (Community Health Centres), District Hospitals, Tertiary & Teaching Hospitals, other public sector hospitals] and Clinical Pharmacy etc. and develop entrepreneurship skills.



# B. Pharm

Bachelor of Pharmacy (B. Pharm)  
Batch 2021-24  
**Course Outcomes (CO)**



**Marwadi University Rajkot**

Students of all undergraduate pharmacy degree programs at the time of graduation will be able to learn:

<b>Course Outcomes Semester-I B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Human Anatomy and Physiology – I 13PH0101	CO1	Explain the gross morphology, structure and functions of various organs of the human body.
	CO2	Describe the various homeostatic mechanisms and their imbalances.
	CO3	Identify the various tissues and organs of different systems of human body.
	CO4	Perform the various experiments related to special senses and nervous system.
	CO5	Appreciate coordinated working pattern of different organs of each system.
Pharmaceutical Analysis 13PH0102	CO1	To understand the principles of Volumetric and electro chemical analysis
	CO2	To carryout various volumetric and electrochemical titrations
	CO3	To develop analytical skills
	CO4	To understand working of analytical instruments
Pharmaceutics - I 13PH0103	CO1	Know the history of profession of pharmacy
	CO2	Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations
	CO3	Understand the professional way of handling the prescription
	CO4	Preparation of various conventional dosage forms
Pharmaceutical Inorganic Chemistry 13PH0104	CO1	know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals
	CO2	understand the medicinal and pharmaceutical importance of inorganic compounds
	CO3	Able to know the properties and medicinal uses of inorganic compounds
	CO4	Understand the assay of inorganic drugs and pharmaceuticals
	CO5	Understand the concept related to acid and base.
Communication Skills 13CS0105	CO1	To understand the behavioural needs for a pharmacist to function effectively in the areas of pharmaceutical operation
	CO2	Enable to communicate effectively (verbal & non-verbal)
	CO3	Able to effectively manage the team as a team player
	CO4	To trained for interview
	CO5	Able to develop leadership qualities and essentials
Remedial Mathematics 13MA101	CO1	This is an introductory course in mathematics. This subject deals with the introduction to Partial fraction, Logarithm, matrices and Determinant, Analytical geometry, Calculus, differential equation and Laplace transform
	CO2	Understand matrices and Determinant
	CO3	Analytical geometry, Calculus, differential equation and Laplace transform
Remedial Biology 13BI0101	CO1	Know the classification and salient feature of five kingdoms of life

	CO2	understand the basic components of anatomy and physiology of plant
	CO3	Know understand the basic components of anatomy and physiology of animal with special reference to human

<b>Course Outcomes Semester-II B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Human Anatomy and Physiology – II 13PH0201	CO1	Explain the gross morphology, structure and functions of various organs of the human body.
	CO2	Describe the various homeostatic mechanisms and their imbalances.
	CO3	Identify the various tissues and organs of different systems of human body.
	CO4	Perform the hematological tests like blood cell counts, hemoglobin estimation, bleeding/clotting time etc. and also record blood pressure, heart rate, pulse and respiratory volume.
	CO5	Appreciate coordinated working pattern of different organs of each system
	CO6	Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.
Pharmaceutical Organic Chemistry - I 13PH0202	CO1	Write the structure, name and the type of isomerism of the organic compound
	CO2	Write the reaction, name the reaction and orientation of reactions
	CO3	Account for reactivity/stability of compounds
	CO4	Identify/confirm the identification of organic compound
Pharmaceutical Engineering 13PH0203	CO1	To know various unit operations used in pharmaceutical industries
	CO2	To understand the material handling techniques
	CO3	To perform various processes involved in pharmaceutical manufacturing process.
	CO4	To carry out various test to prevent environmental pollution
	CO5	To appreciate and comprehend significance of plant lay out design for optimum use of resources.
	CO6	To appreciate the various preventive methods used for corrosion control in pharmaceutical industries
Environmental Sciences 13EN0201	CO1	Create the awareness about environmental problems among learners
	CO2	Impart basic knowledge about the environment and its allied problem
	CO3	develop an attitude of concern for the environment
	CO4	Motivate learner to participate in environment protection and environment improvement
	CO5	acquire skills to help the concerned individuals in identifying and solving environmental problems
	CO6	strive to attain harmony with nature
Computer Applications in Pharmacy 13PH0204	CO1	Know the various types of application of computers in pharmacy
	CO2	Know the various types of databases
	CO3	Know the various applications of databases in pharmacy

<b>Course Outcomes Semester-III B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Pharmaceutical Organic Chemistry - II 13PH0301	CO1	The syllabus emphasizes on mechanisms and orientation of reactions.
	CO2	This subject deals with general methods of preparation and reactions of some organic compounds.
	CO3	Reactivity of organic compounds are also studied here.
	CO4	Chemistry of fats and oils are also included in the syllabus.
Physical Pharmaceutics – I 13PH0302	CO1	Understand various physicochemical properties of drug molecules in the designing the dosage forms
	CO2	Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
	CO3	Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.
Biochemistry 13PH0303	CO1	Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes
	CO2	Understand the metabolism of nutrient molecules in physiological and pathological conditions
	CO3	Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins
Pathophysiology 13PH0304	CO1	Describe the etiology and pathogenesis of the selected disease states
	CO2	Name the signs and symptoms of the diseases
	CO3	Mention the complications of the diseases
Pharmacognosy and Phytochemistry -I 13PH0305	CO1	To understand the techniques in the cultivation and production of crude drugs
	CO2	To describe the crude drugs, their uses and chemical nature
	CO3	To explain the evaluation techniques for the herbal drugs
	CO4	To analyse the microscopic and morphological evaluation of crude drugs

<b>Course Outcomes Semester-IV B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Pharmaceutical Organic Chemistry - III 13PH0401	CO1	understand the methods of preparation and properties of organic compounds
	CO2	explain the stereo chemical aspects of organic compounds and stereo chemical reactions
	CO3	know the medicinal uses and other applications of organic compounds
Medicinal Chemistry - I 13PH0402	CO1	Able to know the chemistry of drugs with respect to their Pharmacological activity
	CO2	Know the drug metabolic pathways, adverse effect and therapeutic value of drugs
	CO3	Know the Structural Activity Relationship (SAR) of different class of drugs
Physical Pharmaceutics - II 13PH0403	CO1	Understand various physicochemical properties of drug molecules in the designing the dosage forms

	CO2	Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
	CO3	Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms
Pharmacology - I 13PH0404	CO1	Understand the pharmacological actions of different categories of drugs
	CO2	Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels
	CO3	Apply the basic pharmacological knowledge in the prevention and treatment of various diseases
	CO4	Observe the effect of drugs on animals by simulated experiments
	CO5	Appreciate correlation of pharmacology with other bio medical sciences
	CO6	Understanding of general pharmacology concepts
Pharmaceutical Jurisprudence 13PH0405	CO1	To understand the Pharmaceutical legislation and their implications in the development and marketing of pharmaceuticals.
	CO2	To Understand Various Indian pharmaceutical Acts and Laws
	CO3	To study the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
	CO4	To study the code of ethics during the pharmaceutical practice.

<b>Course Outcomes Semester-V B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Medicinal Chemistry - II 13PH0501	CO1	To study the chemistry of drugs with respect to their pharmacological activity
	CO2	Know the drug metabolic pathways, adverse effect and therapeutic value of drugs
	CO3	To understand the Structural Activity Relationship of different class of drugs
	CO4	Understanding of the basic biological and pharmacological interactions by using both natural products and synthetic molecules
	CO5	Able to write the chemical synthesis of selected drugs
Pharmacology - II 13PH0502	CO1	Upon completion of the course, the student shall be able to understand the mechanism of drug action and its relevance in the treatment of different diseases.
	CO2	Demonstrate the isolation of different organs/tissues from the laboratory animals by simulated experiments.
	CO3	Demonstrate the various receptor actions using isolated tissue preparation.
	CO4	Appreciate correlation of pharmacology with related medical sciences
Pharmacognosy and Phytochemistry - II 13PH0503	CO1	To know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
	CO2	To understand the preparation and development of herbal formulation

	CO3	To understand the herbal drug interactions
	CO4	To carryout isolation and identification of phyto-constituents
Pharmaceutical Microbiology 13PH0504	CO1	Understand methods of identification, cultivation and preservation of various microorganisms
	CO2	To understand the importance and implementation of sterilization in pharmaceutical processing and industry
	CO3	Learn sterility testing of pharmaceutical products
	CO4	Understand the cell culture technology and its applications in pharmaceutical industries
	CO5	Carried out microbiological standardization of Pharmaceuticals.
Pharmaceutical Biotechnology 13PH0505	CO1	Understanding the importance of Immobilized enzymes in Pharmaceutical Industries
	CO2	Genetic engineering applications in relation to production of pharmaceuticals.
	CO3	Importance of Monoclonal antibodies in Industries.
	CO4	Appreciate the use of microorganisms in fermentation technology.

<b>Course Outcomes Semester-VI B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Medicinal Chemistry - III 13PH0601	CO1	Understand the importance of drug design and different techniques of drug design.
	CO2	Understand the chemistry of drugs with respect to their biological activity.
	CO3	Know the metabolism, adverse effects and therapeutic value of drugs.
	CO4	Know the importance of SAR of drugs
Pharmacology - III 13PH0602	CO1	Understand the mechanism of drug action and its relevance in the treatment of respiratory, digestive and infectious diseases
	CO2	Comprehend the principles of toxicology and treatment of various poisonings
	CO3	Appreciate the correlation of pharmacology with related medical sciences
Herbal Drug Technology 13PH0603	CO1	Understand raw material as a source of herbal drugs from cultivation to herbal drug product
	CO2	Know the WHO and ICH guidelines for the evaluation of herbal drugs.
	CO3	Know the herbal cosmetics, natural sweeteners, nutraceuticals.
	CO4	Appreciate patenting of herbal drugs, GMP.
Biopharmaceutics and Pharmacokinetics 13PH0604	CO1	Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance.
	CO2	Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination.
	CO3	To understand the concepts of bioavailability and bioequivalence of drug products and their significance.
	CO4	Understand various pharmacokinetic parameters, their significance & applications.
Industrial Pharmacy - I	CO1	Know the various pharmaceutical dosage forms

13PH0605		and their manufacturing Techniques.
	CO2	Know various considerations in the development of pharmaceutical dosage forms.
	CO3	Formulate solid, liquid, and semisolid dosage forms and evaluate them for their quality.

<b>Course Outcomes Semester-VII B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Instrumental Methods of Analysis 13PH0701	CO1	To understand the interaction of matter with electromagnetic radiations and its applications in drug analysis
	CO2	To understand the chromatographic separation and analysis of drugs
	CO3	Perform quantitative & qualitative analysis of drugs using various analytical instruments.
Industrial Pharmacy - II 13PH0702	CO1	Know the process of pilot plant and scale-up of pharmaceutical dosage forms.
	CO2	Understand the process of technology transfer from lab scale to commercial batch.
	CO3	Know different Laws and Acts that regulate the pharmaceutical industry.
	CO4	Understand the approval process and regulatory requirements for drug products.
Pharmacy Practice 13PH0703	CO1	Know about Hospital and its organization, hospital & community Pharmacy, detect, assess and report adverse drug reactions.
	CO2	Know various drug distribution methods in a hospital, hospital formulary, therapeutic drug monitoring, medication adherence and able to do medication history interview and counsel the patients
	CO3	Know the functions of Therapeutic Drug Committee, role of pharmacist in education and training, do patient counselling in community pharmacy & communication skills of a pharmacist (with prescribers & patients)
	CO4	Know pharmaceutical care services, monitor drug therapy through medication chart review/clinical review, role of clinical pharmacist, appreciate the concept of rational use of OTC drugs
	CO5	Appreciate the pharmacy stores management and inventory control, interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states.
Novel Drug Delivery Systems 13PH0704	CO1	To understand various approaches for the development of novel drug delivery systems.
	CO2	To understand the criteria for the selection of drugs and polymers for the development of novel drug delivery systems, their formulation and evaluation.
Quality Assurance 13PH0705	CO1	Understand the cGMP aspects in a pharmaceutical industry.
	CO2	Appreciate the importance of documentation.
	CO3	Understand the scope of quality certifications applicable to pharmaceutical industries.
	CO4	Understand the responsibilities of QA & QC departments.
Practice School report 13PH0706	CO1	Provide opportunity for the students to enhance their knowledge and technical skills required for



		various pharmaceutical jobs
	CO2	Ignite scientific temper through collaborative and integrated learning under the guidance of professionals
	CO3	Develop skills required for scientific literature review, finding research gaps, etc
	CO4	Understand of how the concepts learned in the classroom will be applicable in the real-life scenario
	CO5	Sensitize students to the expectation of the work environment, their strengths and weaknesses.

<b>Course Outcomes Semester-VIII B. Pharm</b>		
<b>Subject with code</b>		<b>Course Outcome</b>
Biostatistics and Research Methodology 13PH0801	CO1	Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment).
	CO2	Know the various statistical techniques to solve statistical problems.
	CO3	Appreciate statistical techniques in solving the problems.
Social and Preventive Pharmacy 13PH0802	CO1	Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.
	CO2	Have a critical way of thinking based on current healthcare development.
	CO3	Evaluate alternative ways of solving problems related to health and pharmaceutical issues.
Pharma Marketing Management 13PH0803	CO1	Understand general concepts and scope of marketing, Consumer & Industry buying buying behaviour, Market research, prescribing motivation
	CO2	Understanding of concepts related to product line, product mix decisions, product life cycle, portfolio analysis; product positioning
	CO3	Understanding of concepts relating to methods of product promotion
	CO4	Understanding of pharmaceutical marketing channels & role of professional sales representative
	CO5	Understanding of pricing methods and strategies, issues in price management in the pharmaceutical industry
Pharmaceutical Regulatory Science 13PH0804	CO1	Know about the process of drug discovery and development.
	CO2	Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals.
	CO3	Know the regulatory approval process and their registration in Indian and international markets.
Pharmacovigilance 13PH0805	CO1	History, national and international scenario, importance of safety monitoring
	CO2	Dictionaries, coding, detection and reporting of adverse drug reaction and their assessment
	CO3	classification of disease and drugs, methods to generate safety data, evaluation of drug safety in special population
	CO4	Pharmacovigilance Program of India (PvPI) requirement for ADR reporting in India.
	CO5	ICH guidelines for ICSR, PSUR, expedited

		reporting, pharmacovigilance planning and CIOMS requirements for ADR reporting.
	CO6	Writing case narratives of adverse events and their quality.
Quality Control and Standardization of Herbals 13PH0806	CO1	Know WHO guidelines for quality control of herbal drugs.
	CO2	Know Quality assurance in the herbal drug industry.
	CO3	Know the regulatory approval process and their registration in Indian and international markets.
	CO4	Appreciate EU and ICH guidelines for quality control of herbal drugs.
Computer-Aided Drug Design 13PH0807	CO1	Design and discovery of lead molecules.
	CO2	The role of drug design in the drug discovery process.
	CO3	The concept of QSAR and docking.
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	CO5	The design of new drug molecules using molecular modelling software.
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	CO3	know about the role of herbs in sunscreens.
Experimental Pharmacology 13PH0810	CO1	Appreciate the applications of various commonly used laboratory animals.
	CO2	Appreciate and demonstrate the various screening methods used in preclinical research.
	CO3	Appreciate and demonstrate the importance of biostatistics and research methodology.
	CO4	Design and execute a research hypothesis independently.
Advanced Instrumentation Techniques 13PH0811	CO1	Understand the advanced instrument used and its applications in drug analysis.
	CO2	Understand the chromatographic separation and analysis of the drug.
	CO3	Understand the calibration of various analytical instruments.
	CO4	Know analysis of drugs using various analytical instruments.
Dietary Supplements and Nutraceuticals 13PH0812	CO1	Understand the need for supplements by the different groups of people to maintain a healthy life.
	CO2	Understand the outcome of deficiencies in dietary supplements.
	CO3	Appreciate the components in dietary supplements and their application.
	CO4	Appreciate the regulatory and commercial aspects of dietary supplements including health claims.
Project Work	CO1	Provide an opportunity to explore the area of

13PH0813		interest
	CO2	Develop the technical skills required for research work
	CO3	Develop skills required for literature review, finding research gaps, and writing a scientific report of minor research project

# **COURSE OUTCOME**

## **FACULTY OF LAW**

## B.A.LL.B.(Hons.)

### Course Outcomes (COs) for Batch 2018-23

<b>Course Outcomes for the First Year First Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE I 10BA0101	CO1	Thorough understanding of the key concepts of Political science
	CO2	They will be able to describe and analyse the core concepts of politics
	CO3	They would understand the discipline's terminology and methods
	CO4	They will also be able to explore instances of applied political science through real world examples
ECONOMICS I 10BA0102	CO1	Develop acquaintance with the functioning of various Micro concepts in the real world phenomenon.
	CO2	Analyse various legal and economic issues and which are often found to be strongly associated with each other and develop meaningful solutions for the same
	CO3	Comprehend the structural framework and functioning of various Laws and Acts which are built upon various Economic Theories and Principles
SOCIOLOGY I 10BA0103	CO1	understand and appreciate the social institutions and organizations.
	CO2	apply sociological concepts and will be able to relate with society.
	CO3	examine social problems and evaluate its various dimensions.

LEGAL METHODS 10BA0105	CO1	Understand the concept, sources and the functions of law and various legal systems of the world.
	CO2	Understand the hierarchy of the Indian courts and their jurisdictions
	CO3	Understand judicial reasoning and its application in the Courts
	CO4	Acquire the ability to identify legal issues and principles underlying in any given factual situation and to undertake and present research on such issues
	CO5	Equip with the basics of legal research methodology and legal writing
LAW OF CONTRACT – I (GENERAL PRINCIPLES) 10BA0106	CO1	Develop a conceptual understanding of the basics of law of contract.
	CO2	Understand the legal aspects of a valid contract and at the same time judge a void and voidable contract.
	CO3	Learn the remedies available in cases of breach of contract
	CO4	Have conceptual understanding of E-contracts, and government Contracts.
	CO5	Develop strong analytical skills
CRITICAL THINKING & ARGUMENTATIVE SKILLS 10CR0101	CO1	Identify the differences between fact and opinion.
	CO2	Identify, compose and refute propositions of fact, value and policy.
	CO3	To understand the methods of analyzing evidences in order to organize, deliver and critique effective arguments and rebuttals.
	CO4	Analyze and utilize formal and informal logic to construct arguments which advocate or defend position(s).
	CO5	Utilize ethical communication when developing arguments while simultaneously taking into consideration diverse audiences.
ENGLISH – I (LINGUISTICS AND LITERATURE) 10SL0101	CO1	The students will get the necessary training in language skills and they will be able to develop and enhance their listening skills for various purposes
	CO2	The students will get the necessary training in language skills and they will be able to understand and use written and spoken language in context.

	CO3	The students will get the necessary training in language skills and they will be able to comprehend, compare and differentiate between various written texts/documents
	CO4	The students will get the necessary training in language skills and they will be able to evolve appropriate writing competence.
<b>Course Outcomes for the First Year Second Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE II (CONTEMPORARY ISSUES IN INDIAN POLITICS) 10BA0201	CO1	Understanding of Post-Colonial India.
	CO2	Dynamics of Indian politics.
	CO3	Interconnections of Religion, Caste and Politics.
	CO4	Importance of federo-unitary structure of India.
	CO5	Understanding of Local and National politics.
ECONOMICS II (MACROECONOMICS) 10BA0202	CO1	Develop acquaintance with the functioning of Macroeconomic concepts in the real world phenomenon.
	CO2	Analyse various economic issues and come up with meaningful solutions to the economic problems.
	CO3	Comprehend the structural framework and functioning of various Laws and Acts which are built upon Macroeconomic Theories and Principles.
SOCIOLOGY II (INDIAN SOCIETY AND LAW: AN INTERFACE) 10BA0203	CO1	Know conceptual and theoretical orientation on Indian society.
	CO2	Apply theories on how legal institutions operate in relation to social institutions.
	CO3	Assess socio-legal issues and challenges of Indian society.
LAW OF TORTS, CONSUMER PROTECTION ACT, 1986 & MOTOR VEHICLE ACT, 1988 10BA0204	CO1	Understand the concept of torts, its essentials and kinds with defences.
	CO2	Differentiate between the tortuous liability, criminal liability and contractual liability.
	CO3	Safeguard the rights and interest of consumers which they can enforce under the provisions of The Consumer Protection Act, 1986.

	CO4	Understand the justice dispensation system under The Consumer Protection Act, 1986.
	CO5	Learn the basic forms of no fault liabilities and insurance policies which will enable students to help an aggrieved get the appropriate remedy provided under the existing laws.
LAW OF CONTRACT – II 10BA0205	CO1	To recall concepts of contract to special contracts
	CO2	To demonstrate understanding on various principles relating to Contract of Indemnity & Guarantee.
	CO3	To experiment with principles and provisions on Bailment & Pledge.
	CO4	To examine the principle of agency in practice
	CO5	To evaluate the difference between Partnership & Limited Liability Partnership Act and benefits.
	CO6	To formulate the modern contract technique and develop new drafting skills in the Sale of Goods Act 1930 with Amendments.
MOOT COURT TRAINING 10BA0206	CO1	Identify the legal issues arising from a hypothetical set of facts
	CO2	Research the law relevant to these legal issues
	CO3	Formulate legal argument based on this research
	CO4	Apply the law accurately and persuasively
	CO5	Distinguish any case law which runs contrary to the argument being made
	CO6	Present this argument articulately and clearly in an oral format
INTERNSHIP (NGO) 10BA0207	CO1	Understand the nuances of social reality
	CO2	Identify the social issues facing by the people in society
	CO3	Create an ambiance for amelioration of the issues related to society
LAW THROUGH POPULAR MEDIA 10SL0151	CO1	Understand and analyze the different courtroom situations in a critical manner
	CO2	Use legal language with reference to a particular context
	CO3	Create an argument critically in the field of Law
<b>Course Outcomes for the Second Year Third Semester Course</b>		



<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE III (INDIAN GOVERNMENT & POLITICS) 10BA0301	CO1	Awareness of the key concepts of Indian government and politics
	CO2	It will help students in developing better understanding of Indian politics
	CO3	Students will learn about the role, powers and functions of The President, Prime Minister, Governor and Chief Minister
	CO4	Role of local, rural and urban governments and their importance
ECONOMICS III 10BA0302	CO1	Develop an understanding of Policy Formulation in context of India vis-à-vis their comparison with other nations.
	CO2	Analyze various economic issues and come up with meaningful solutions to the economic problems.
	CO3	Comprehend the structural framework and functioning of various Laws and Acts which are built upon various economies issues
SOCIOLOGY III (LAW IN A CHANGING SOCIETY: CHALLENGES & PROSPECTS) 10BA0303	CO1	Acquire an in-depth knowledge on law and society tracing the genesis and practices
	CO2	Analyse systematic patterns in the uses and consequences of law in changing society
	CO3	Evaluate critically the nature of law in changing society, especially Indian society
JURISPRUDENCE 10BA0304	CO1	Interpret and assess competing philosophical and ethical perspectives on law, and to use those perspectives to formulate arguments about law, politics and ethics.
	CO2	Identify and analyze critically key jurisprudential issues.
	CO3	Engage in and cultivate reasoned legal and moral arguments, by way of both oral and written presentation.
	CO4	Produce (by a specified deadline) a concise and appropriately structured report addressing a key jurisprudential issue.

	CO5	Carry out literature reviews, formulate theses and summarize legal and ethical perspectives.
	CO6	Think logically, to assess competing principles impartially and to identify and solve legal and ethical problems
FAMILY LAW I 10BA0305	CO1	Have conceptual clarity about marriage, divorce, parental custody, domestic abuse and children's rights.
	CO2	Understand the establishment, composition and powers of family Courts.
	CO3	Understand and address the various issues and problems of adoption and maintenance.
	CO4	Understand the provisions of guardianship and minority
	CO5	Have clarity about Muslim Laws covering both codified and unmodified part.
CONSTITUTIONAL LAW I 10BA0306	CO1	Understand the meaning nature and salient features of the Constitution of India.
	CO2	Understand the jurisprudence of the fundamental freedoms guaranteed to the citizens of India
	CO3	Learn the Fundamental rights and duties guaranteed by the constitution
	CO4	Acquire a basic knowledge of the constitutional remedies in case of violation of fundamental rights
	CO5	Study the interrelationship between fundamental rights, fundamental duties and Directive principles of state policy and their role in achieving the constitutional goals
	CO6	Analyse the case law critically in the context of the ideal of a welfare state
LAW OF CRIMES - I (IPC) (GENERAL PRINCIPLES) 10BA0307	CO1	Shall develop a conceptual understanding of the basics principles of law of crime
	CO2	Shall be able to understand different elements and stages of crime.
	CO3	Shall be able to analyze about criminal liability and inchoate crime
	CO4	Shall also learn about the general defenses available to a criminal.

INTERNSHIP (LOWER COURT I) 4 WEEKS 10BA0308	CO1	Understand the basic requirement of depth knowledge of the subject matter in a case.
	CO2	Analyse the most basic legal cases.
	CO3	Create an alignment of curriculum with enormous practical exposure.
LANGUAGE (BASICS OF FRENCH LANGUAGE FRENCH - I) 10SL0301	CO1	The learner will be able to use basic greetings in the French language.
	CO2	The learner will be able to use genders, numbers and articles in the French language.
	CO3	The learner will have the basic vocabulary to have communication in the French language.
<b>Course Outcomes for the Second Year Fourth Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE IV 10BA0401	CO1	Understanding and knowledge of Indian Political thought
	CO2	Introduction to selected texts of different eras
	CO3	Thorough understanding of historical narratives and its impact on the thought process of that particular era
	CO4	Motivate them to learn and search more about the past
	CO5	To make their spectrum of thoughts wider
PUBLIC INTERNATIONAL LAW 10BA0402	CO1	Understanding the importance and implication of International Law and Organizations
	CO2	Understand that in absence of Municipal Law how Public International Law helps the states to follow a Code of Conduct
	CO3	Appreciate the role of Public International Law
ENVIRONMENT LAW 10BA0403	CO1	Shall develop a conceptual understanding of the environmental concern, world over.
	CO2	Acquire a clear knowledge of various laws, nationally and internationally,
	CO3	Shall be able to evaluate, analyze and assess the laws and its practical application.

	CO4	Shall also endeavor to find out the changing positions of world with respect to tackling the threat posed by environmental degradation.
FAMILY LAW II 10BA0404	CO1	The students will be able to Shall understand the various concepts and institutions of Hindu joint family system.
	CO2	Student Shall understand the law and procedures of succession with its different forms i.e. Intestate and testamentary succession.
	CO3	Student Shall understand women's property rights under different Religious system and statutory provisions.
	CO4	Student Shall understand the provisions with respect to bequest under different religious practices.
CONSTITUTIONAL LAW II 10BA0405	CO1	Introduction to Union Executive
	CO2	Basics of Union Cabinet
	CO3	Introduction to parliament
	CO4	Concept of union judiciary
	CO5	Introduction State Executive
	CO6	Basic of State Legislature, High Courts, Subordinate Courts, Distribution of power between Center and State, Emergency Provisions and Amendments
LAW OF CRIMES - II (IPC) (GENERAL PRINCIPLES) 10BA0406	CO1	Shall develop a conceptual understanding of the specific principles of Criminal Law.
	CO2	Shall be able to understand different offences against Human Body such as Murder and Rape.
	CO3	Shall be able to understand different offences against Property such as theft, Extortion, robbery, dacoity etc.
	CO4	Shall develop an understanding of different offences against peace and tranquility of State.
INTERNSHIP (LOWER COURT 2) 4 WEEKS	CO1	Understand the basic requirement of depth knowledge of the subject matter in a case.

10BA0407	CO2	Analyse the most basic legal cases.
	CO3	Create an alignment of curriculum with enormous practical exposure.
LANGUAGE (BASICS OF FRENCH LANGUAGE FRENCH - II) 10SL0401	CO1	The learner will be able to introduce himself/herself in the French Language.
	CO2	The learner will be able to understand the basic questions in the French language.
	CO3	The learner will be able to answer the basic questions in the French Language.
<b>Course Outcomes for the Third Year Fifth Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE V (COMPARATIVE GOVERNMENT & POLITICS) 10BA0501	CO1	To understand the key concepts, nature, scope, methods and significance of Comparative Government and Politics
	CO2	To apply and compare a classification of Political Systems and Regimes
	CO3	To analyze different Electoral Systems in a Democratic Regime or a Political System
	CO4	To Evaluate contemporary debates on the changing nature of nation-state
HUMAN RIGHTS & INTERNATIONAL HUMANITARIAN LAW 10BB0501	CO1	To understand the concept of jus in bello and jus ad bellum to analyse the principle of proportionality, precaution and distinction To be able to identify the meaning of IHL and IHRL To apply IHL and IHRL
	CO2	To be able to identify the meaning of customary international law in International Human rights law and International Humanitarian Law.
	CO3	To be able to explain the law regarding warfare and the modern developments in it.
	CO4	To be able to able to develop a critical thinking regarding the International humanitarian law and human rights law
CRIMINAL PROCEDURE CODE 10BB0502	CO1	Identify the stages in investigation and procedure of trial in criminal cases
	CO2	Explain the powers, functions, and duties of police and criminal courts.
	CO3	Understand the provisions relating to maintenance of Wife, Children and Parents.

CORPORATE LAW I 10BB0503	CO1	To recall basic concepts and Characteristics of company
	CO2	To demonstrate Incorporation procedure and its Consequences
	CO3	To apply provisions relating to various prospectus and types of share issuance.
	CO4	To classify and compare various types of debentures
	CO5	To evaluate membership and modes of acquiring membership
	CO6	To formulate high standards relating to the directors and key managerial personals.
LAW OF EVIDENCE 10BB0504	CO1	Recognize evidence that is admissible before the court of law
	CO2	Understand the difference between admissible and inadmissible evidence
	CO3	Analyze the kinds of evidence and their admissibility under different sections of IEA
	CO4	Apply legal provisions to the problem in front of them with regards to admissibility of evidence
	CO5	Recognize evidence that is admissible before the court of law
ADMINISTRATIVE LAW 10BB0505	CO1	To understand the meaning and scope of administrative law
	CO2	To be able to apply the concept of Rule of Law and Separation of Powers
	CO3	To be able to analyse the scope and objective of delegated legislation and emerging trends in administrative law
LEGAL WRITING 10BB0506	CO1	Understand the meaning and scope of legal writing as a discipline
	CO2	To identify importance of language in legal writing
	CO3	to enable students to draft various legal documents.
	CO4	To help students analyse the differences between the academic and non academic writing.
	CO5	to demonstrate the importance of ethics in legal writing and research
INTERNSHIP (HIGH COURT 1) 4 WEEKS 10BB0507	CO1	Understand the nuances of social reality
	CO2	Identify the social issues facing by the people in society
	CO3	Create an ambience for amelioration of the issues related to society

<b>Course Outcomes for the Third Year Sixth Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE VI (WESTERN POLITICAL THOUGHT) 10BA0601	CO1	Define and Relate the principal modes of political thought in the West.
	CO2	Outline political thought through the Classical, Renaissance, and Enlightenment periods based on the works of Plato, Aristotle, Machiavelli, Hobbes, Locke, Rousseau, Tocqueville, and Marx.
	CO3	Dissect the differences between Plato and Aristotle with regard to their understandings of the nature of the person, ethics, society, citizenship, and governance.
	CO4	Measure the historical and intellectual context in which the western political thought helped to develop the modern nation-state.
LABOUR & INDUSTRIAL LAW I 10FL0601	CO1	Understand the labour legislation and various other provisions thereby
	CO2	Apply the knowledge of various labour laws and become aware of the rights and responsibilities of the management and especially workmen and trade unions, compliance and penalties under provided under the labour laws
	CO3	Analyze the scope and objectives of labour laws and enable students to understand the reforms required in the law to cope up the recent developments taking place
	CO4	Assess and develop a higher thinking order relating to the labour administration and justice
INTERPRETATION OF STATUTES 10FL0602	CO1	On completion of this course, students will be able to To know and understand the concept of Interpretation and its difference with construction.
	CO2	To be able to demonstrate the different rules of interpretation
	CO3	To apply the relevancy of various principles of interpretation
	CO4	To be able to analyse the internal aids to construction and external aids to construction.

	CO5	To evaluate the roles of judiciary along with extent in ascertaining meaning of any statute and to develop a higher thinking order through identifying the new judicial trend.
	CO6	To be able to elaborate on the interpretation of constitution and its importance.
CORPORATE LAW II 10FL0603	CO1	To define the basic concepts & procedure of corporate administration.
	CO2	To compare among inspection, inquiry and investigation of a company
	CO3	To evaluate Compromises, Arrangements and Amalgamations and their procedural aspect
	CO4	To identify Prevention of Oppression and Mismanagement through case laws
	CO5	To analyse Offences, Penalties and their compounding nature.
	CO6	To elaborate the procedure & reasons for winding up & To formulate the jurisdiction and application of National Company Law Tribunal and Appellate Tribunal on the dispute on corporate affairs of company.
CIVIL PROCEDURE CODE & LIMITATION ACT 10FL0604	CO1	State the detail procedure for redressal of civil rights.
	CO2	Identify the place of suing, procedure for institution of suit, the documents in support and against, evidence taking and trial, dimensions of an interim order, the peculiar nature of the suits, the complexities of executing a decree and provisions for appeal and revision.
	CO3	Analyze the procedural requirement to initiate trail of civil civil Describe Parties of suits, Institution and Trial of suit.
	CO4	Execute Plaintiff and written statement.
	CO5	Compare Suits, Appeals, Review and Reference.
	CO6	Relate the law of limitation to civil proceedings.
PROPERTY LAW 10FL0605	CO1	On completion of this course, students will be able to define the various kinds of properties.
	CO2	Describe the principles of transfer of property applicable to both movable and immovable properties.



	CO3	Identify the principles applicable to Transfer of Immovable Property
	CO4	Relate the provisions of Sale and Mortgage.
	CO5	Relate the provisions of Charge and lease.
	CO6	Interpret provisions of Gift, Actionable Claim and Indian Easement Act
INTELLECTUAL PROPERTY LAW 10FL0606	CO1	To exhibit memory on the basic concept of IP rights.
	CO2	To Compare product/process patents and relating rules.
	CO3	To identify trademarks & geographical indications and their application.
	CO4	To examine the provisions relating to the Copyright.
	CO5	To appraise importance of industrial designs by interpreting judicial decisions.
	CO6	To imagine the consequences of non-protection of trade secrets & key business concerns in commercializing intellectual property.
INTERNSHIP HIGH COURT 2) 4 WEEKS 10FL0607	CO1	To define the basic concepts & procedure of court proceeding.
	CO2	To evaluate various legal matters present in society and its regulations
	CO3	To compare various rules and regulations.
	CO4	To identify Alternative dispute settlement.
	CO5	To analyze court objectives, power, functions and penalties.
	CO6	To elaborate the court procedure, power, functions and penalties.
<b>Course Outcomes for the Fourth Year Seventh Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
LAW ON MERGER AND ACQUISITION 10BL0701	CO1	Define and classify various types of corporate restructuring.
	CO2	Identify the acquisition techniques of takeover.
	CO3	Examine and break information relating to the planning, strategy and taxation & Stamp duty relating to the corporate restructuring.
	CO4	Evaluate and determine process and documentation -Merger and Acquisition Transactions.
	CO5	Interpret the regulatory approvals of Scheme & Appearance before NCLT/ NCLAT

	CO6	Formulate and discuss the technique of Fast Track Mergers & Cross Border Mergers.
LAW ON INFRASTRUCTURE DEVELOPMENT 10BL0702	CO1	To understand the basics in infrastructure laws in order to undertake advanced courses in the field
	CO2	To analyse the comparative assessment of the regulatory laws and policies of different infrastructure sectors
	CO3	To interpret the main aspects of the legal framework that governs the development of infrastructure projects through private participation
	CO4	To evaluate the core issues in general and specific infrastructure sectors
	CO5	To apply various laws, policies, judicial pronouncement, and reforms in the field of infrastructure.
CRIMINOLOGY 10CR0701	CO1	Explain the underlying philosophies, history, concepts of Criminology.
	CO2	Understand the theories of causation of crime.
	CO3	Demonstrate the various criminal typologies
	CO4	Analyze the concept of punishment.
	CO5	Analyze the concept Female Criminality and victimity
IT OFFENCES 10CR0702	CO1	To understand the basics in the legal framework on information technology and relevant offences
	CO2	To analyse the laws relevant to information technology offences
	CO3	To interpret the cyber security laws
	CO4	To evaluate legal recognition and authentication of electronic records in relation to information technology offences
	CO5	To apply various laws and policies to the liability of intermediaries, publishers of digital news and online curated content
LABOUR & INDUSTRIAL LAW II 10FL0701	CO1	Understand the labour legislations and various other provisions thereby.
	CO2	Apply the knowledge of various labour laws and become aware of the social security and labour welfare.

	CO3	Analyze the scope and objectives of labour laws and enable students to understand the reforms required in the law to cope up the recent developments taking place.
	CO4	Assess and develop a higher thinking order relating to the labour administration and justice.
DRAFTING, PLEADING AND CONVEYANCE (CLINICAL COURSE II) 10FL0702	CO1	After completing this course, Students will be able to Analyze and apply general principles of drafting and conveyancing.
	CO2	Use effective writing techniques to draft different types of legal documents.
	CO3	Draft different types of Deeds including deed of sale of land, mortgage deeds, license deeds, lease deeds, assignment deeds, trust deeds, partnership deeds and power of attorney deeds.
	CO4	Draft different types of contracts including commercial agreements, professional services agreement, employment agreements franchise, agency, dealership and distributorship agreements, intellectual property rights agreements, arbitration agreements, foreign collaboration and joint ventures agreements and real estate and tenancy agreements.
	CO5	Analyze and apply general principles of drafting and conveyancing.
	CO6	Use effective writing techniques to draft different types of legal documents.
TAXATION LAW I 10FL0703	CO1	To define the basic concepts & procedure of Taxation Laws I i.e. Direct Tax Law & Practices.
	CO2	To compare computation of income under the head of salary/ house property/ profits and gains from business and profession.
	CO3	To identify computation of income under the head of capital gains/ from other sources/ total income and tax liability.
	CO4	To analyse clubbing provisions, set-off and / or carry forward of losses, rebate and relief & TDS/TCS, returns, refund & recovery.

	CO5	To elaborate procedure, power, functions, penalties and to formulate the jurisdiction & application of income tax law & authorities.
ALTERNATIVE DISPUTE RESOLUTION (CLINICAL COURSE III) 10FL0704	CO1	On completion of this course, students will be able To be remember and understand the different facets of Alternate Dispute Resolution
	CO2	To be able to apply the principles of negotiation, conciliation and mediation in modern day situations
	CO3	To be able to analyze the nuances of arbitration law in India
	CO4	To evaluate the role of alternate dispute resolution in reducing the burden of courts along with extent to develop a higher thinking order through identifying the emerging trends in the concerned legal framework.
INVESTMENT & SECURITY LAW 10FL0705	CO1	To define the basic concepts & procedure of investment and securities laws.
	CO2	To evaluate various financial instruments present in money market and its regulations.
	CO3	To compare investment in Mutual funds, its rules and regulations with other investment options.
	CO4	To identify Alternative Investment Fund & Collective Investment Schemes with applicable laws.
	CO5	To analyse SEBI objectives, power, functions and penalties.
	CO6	To elaborate the SCRA procedure, power, functions and penalties on Stock Exchanges in India. 7. To formulate the jurisdiction & application of SEBI, SAT and various Courts relating to the Investor protection in securities market.
INTERNSHIP (SUPREME COURT/LAW FIRM/CORPORATE HOUSE 1/COURT I) 4 WEEKS	CO1	Understand the nuances of social reality
	CO2	Identify the social issues facing by the people in society
	CO3	Create an ambience for amelioration of the issues related to society
<b>Course Outcomes for the Fourth Year Eight Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>

LAW ON CORPORATE FINANCE 10BL0801	CO1	Know basic on Equity Public/ Private Funding.
	CO2	Illustrate Indian Equity- Non-Fund Based regulation.
	CO3	Solve the problems of Debt Funding – Indian Fund Based (Corporate Debt).
	CO4	Examine by identifying causes related Debt Funding – Indian Non-Fund Based.
	CO5	Establish opinion through judgments on regulation on Foreign Funding – Instruments & Institutions.
	CO6	Elaborate Company Listing on Indian/International Stock Exchanges procedures and laws & solutions in related problems.
LAW OF CORPORATE GOVERNANCE 10BL0802	CO1	To understand the concept of corporate governance and will also be able to appreciate the principles, theories and models of corporate governance.
	CO2	To explain the legislative framework of corporate governance in India.
	CO3	To describe about the role of Auditors in corporate governance.
	CO4	To interpret the role of SEBI in corporate governance.
PENOLOGY AND VICTIMOLOGY 10CR0801	CO1	Understand contemporary issues and challenges of punishment system.
	CO2	Explain the typologies and theories of victimization.
	CO3	Apply the procedure for the proper treatment to victims.
	CO4	Analyse the sentencing policies of India.
	CO5	Evaluate efficacy of capital punishment in Indian context.
ADMINISTRATION OF CRIMINAL JUSTICE I 10CR0802	CO1	Describe jurisprudential aspects of Criminal Justice Administration.
	CO2	Analyze the manner in which society responds to crime.
	CO3	Evaluate the merits of various theories of crime.
	CO4	Understand the interconnection of Crime and Society in India
	CO5	Apply and elaborate about the facets of Human Rights and Criminal Justice System in India.
BANKING & INSURANCE LAW 10FL0801	CO1	Define and demonstrate understanding of facts & ideas relating to banking and insurance laws.

	CO2	Identify new situation by applying techniques & rules in a different way in Banking System.
	CO3	Examine and Compare evidence to support generalizations in Negotiable Instruments, SARFAESI Act and Foreign Exchange Management.
	CO4	Appraise the opinions by making judgments based on a set of criteria related to concept of insurance.
	CO5	To develop new pattern of resolutions to overcome from problem related to health/ general/agriculture/ motor insurances.
PRIVATE INTERNATIONAL LAW 10FL0802	CO1	Understand and remember the principles of conflict of laws and its application in cases involving foreign element
	CO2	Apply the concept of domicile in matrimonial disputes
	CO3	Analyze the principles of conflict of laws in relation to the Indian legal mechanism and its practices
	CO4	Evaluate the issue of jurisdiction and application of foreign laws in a case where foreign element is involved
COMPETITION LAW 10FL0803	CO1	Define basic economics related to the competition, monopoly, Market power etc.
	CO2	Interpret Competition Act 2002.
	CO3	Solve the problems of Anti-competitive agreements and related issues.
	CO4	Examine by identifying causes related to prohibition on abuse of dominant position.
	CO5	Present and defend opinions through judgments on regulation of combinations.
	CO6	Formulate CCI role and Competition law jurisprudence compilation in developing a new pattern/ proposing alternative solutions.
TAXATION LAW II (INDIRECT TAX LAW & PRACTICES)	CO1	To understand the concept of indirect taxes, indirect tax system in India, difference between direct and indirect tax and Double Tax Avoidance Treaty.

10FL0804	CO2	To interpret the various principles underlying the Indirect Taxation Statutes with reference to Goods and Services Tax Act, 2017
	CO3	To describe the provisions of IGST Act, 2017, UTGST Act, 2017 and its working and Provisions of GST (Compensation to State) Act, 2017.
	CO4	To acquire the ability to analyse and interpret the various provisions of Custom Laws.
PUBLIC INTEREST LAWYERING, LEGAL AID & PARA LEGAL SERVICES (CLINICAL COURSE IV) 10FL0805	CO1	To know and understand the structure and working of the legal services institutions under the Legal Services Authorities Act, 1987.
	CO2	To analyze and evaluate the significance of Public Interest Litigation(s) and its effects on the society
	CO3	To coordinate with the legal services institutions and other Authorities for the best interest of beneficiaries and stakeholders.
	CO4	To create and understand how to draft various documents essential to a public interest practice
INTERNSHIP (SUPREME COURT/LAW FIRM/CORPORATE HOUSE 2) 4 WEEKS 10FL0806	CO1	Identify, accurately formulate, and apply the rules or principles of law pertinent to the situation
	CO2	Draw and explain relevant factual analogies and distinctions
	CO3	Critically examine the rules, principles, and reasoning upon which legal arguments are based
	CO4	Develop, elaborate, and evaluate legal theories relevant to the situation

## Course Outcomes (COs) for Batch 2019-24

<b>Course Outcomes for the First Year First Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE I 10BA0101	CO1	Thorough understanding of the key concepts of Political science
	CO2	They will be able to describe and analyse the core concepts of politics
	CO3	They would understand the discipline's terminology and methods
	CO4	They will also be able to explore instances of applied political science through real world examples
ECONOMICS I 10BA0102	CO1	Develop acquaintance with the functioning of various Micro concepts in the real world phenomenon.
	CO2	Analyse various legal and economic issues and which are often found to be strongly associated with each other and develop meaningful solutions for the same
	CO3	Comprehend the structural framework and functioning of various Laws and Acts which are built upon various Economic Theories and Principles
SOCIOLOGY I 10BA0103	CO1	understand and appreciate the social institutions and organizations.
	CO2	apply sociological concepts and will be able to relate with society.
	CO3	examine social problems and evaluate its various dimensions.
LEGAL METHODS 10BA0105	CO1	Understand the concept, sources and the functions of law and various legal systems of the world.
	CO2	Understand the hierarchy of the Indian courts and their jurisdictions
	CO3	Understand judicial reasoning and its application in the Courts
	CO4	Acquire the ability to identify legal issues and principles underlying in any given factual situation and to undertake and present research on such issues
	CO5	Equip with the basics of legal research methodology and legal writing
	CO1	Develop a conceptual understanding of the basics of law of contract.



LAW OF CONTRACT – I (GENERAL PRINCIPLES) 10BA0106	CO2	Understand the legal aspects of a valid contract and at the same time judge a void and voidable contract.
	CO3	Learn the remedies available in cases of breach of contract
	CO4	Have conceptual understanding of E-contracts, and government Contracts.
	CO5	Develop strong analytical skills
CRITICAL THINKING & ARGUMENTATIVE SKILLS 10CR0101	CO1	Identify the differences between fact and opinion.
	CO2	Identify, compose and refute propositions of fact, value and policy.
	CO3	To understand the methods of analyzing evidences in order to organize, deliver and critique effective arguments and rebuttals.
	CO4	Analyze and utilize formal and informal logic to construct arguments which advocate or defend position(s).
ENGLISH – I (LINGUISTICS AND LITERATURE) 10SL0101	CO1	The students will get the necessary training in language skills and they will be able to develop and enhance their listening skills for various purposes
	CO2	The students will get the necessary training in language skills and they will be able to understand and use written and spoken language in context.
	CO3	The students will get the necessary training in language skills and they will be able to comprehend, compare and differentiate between various written texts/documents
	CO4	The students will get the necessary training in language skills and they will be able to evolve appropriate writing competence.
<b>Course Outcomes for the First Year Second Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL IDEOLOGIES AND INTERNATIONAL RELATIONS 10BA0208	CO1	Compare and Classify critically the process of International Politics and Relations in the backdrop of Globalization
	CO2	Demonstrate the effects of Post Cold War Order onto International Politics

	CO3	Interconnections of Nation-State's Foreign Policies in International Politics
	CO4	Determine the Efficacy of International and Global Organizations
	CO5	Build over the various aspects of International and global problems and conflict situations of the contemporary world
	CO6	Define the diverse politico-legal, socio-economic and cultural aspects of globalized world that affect the global decision-making process
ECONOMICS II (MACROECONOMICS) 10BA0202	CO1	Develop acquaintance with the functioning of Macroeconomic concepts in the real world phenomenon.
	CO2	Analyse various economic issues and come up with meaningful solutions to the economic problems.
	CO3	Comprehend the structural framework and functioning of various Laws and Acts which are built upon Macroeconomic Theories and Principles.
SOCIOLOGY II (INDIAN SOCIETY AND LAW: AN INTERFACE) 10BA0203	CO1	Know conceptual and theoretical orientation on Indian society.
	CO2	Apply theories on how legal institutions operate in relation to social institutions.
	CO3	Assess socio-legal issues and challenges of Indian society.
LAW OF TORTS, CONSUMER PROTECTION ACT, 1986 & MOTOR VEHICLE ACT, 1988 10BA0204	CO1	Understand the concept of torts, its essentials and kinds with defences.
	CO2	Differentiate between the tortuous liability, criminal liability and contractual liability.
	CO3	Safeguard the rights and interest of consumers which they can enforce under the provisions of The Consumer Protection Act, 1986.
	CO4	Understand the justice dispensation system under The Consumer Protection Act, 1986.
	CO5	Learn the basic forms of no fault liabilities and insurance policies which will enable students to help an aggrieved get the appropriate remedy provided under the existing laws.
LAW OF CONTRACT – II	CO1	To recall concepts of contract to special contracts

10BA0205	CO2	To demonstrate understanding on various principles relating to Contract of Indemnity & Guarantee.
	CO3	To experiment with principles and provisions on Bailment & Pledge.
	CO4	To examine the principle of agency in practice
	CO5	To evaluate the difference between Partnership & Limited Liability Partnership Act and benefits.
	CO6	To formulate the modern contract technique and develop new drafting skills in the Sale of Goods Act 1930 with Amendments.
MOOT COURT TRAINING 10BA0206	CO1	Identify the legal issues arising from a hypothetical set of facts
	CO2	Research the law relevant to these legal issues
	CO3	Formulate legal argument based on this research
	CO4	Apply the law accurately and persuasively
	CO5	Distinguish any case law which runs contrary to the argument being made
	CO6	Present this argument articulately and clearly in an oral format
INTERNSHIP (NGO) 10BA0207	CO1	Understand the nuances of social reality
	CO2	Identify the social issues facing by the people in society
	CO3	Create an ambiance for amelioration of the issues related to society
LAW THROUGH POPULAR MEDIA 10SL0151	CO1	Understand and analyze the different courtroom situations in a critical manner
	CO2	Use legal language with reference to a particular context
	CO3	Create an argument critically in the field of Law
<b>Course Outcomes for the Second Year Third Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
PUBLIC ADMINISTRATION, LAW AND GOVERNANCE 10BA0309	CO1	To understand the working of public administration.
	CO2	To analyze the processes of governance and relate it with public administration theories.
	CO3	To reflect over the process of governance(s) and provide alternatives.

ECONOMICS III 10BA0302	CO1	Develop an understanding of Policy Formulation in context of India vis-à-vis their comparison with other nations.
	CO2	Analyze various economic issues and come up with meaningful solutions to the economic problems.
	CO3	Comprehend the structural framework and functioning of various Laws and Acts which are built upon various economies issues
SOCIOLOGY III (LAW IN A CHANGING SOCIETY: CHALLENGES & PROSPECTS) 10BA0303	CO1	Acquire an in-depth knowledge on law and society tracing the genesis and practices
	CO2	Analyse systematic patterns in the uses and consequences of law in changing society
	CO3	Evaluate critically the nature of law in changing society, especially Indian society
JURISPRUDENCE 10BA0304	CO1	Interpret and assess competing philosophical and ethical perspectives on law, and to use those perspectives to formulate arguments about law, politics and ethics.
	CO2	Identify and analyze critically key jurisprudential issues.
	CO3	Engage in and cultivate reasoned legal and moral arguments, by way of both oral and written presentation.
	CO4	Produce (by a specified deadline) a concise and appropriately structured report addressing a key jurisprudential issue.
	CO5	Carry out literature reviews, formulate theses and summarize legal and ethical perspectives.
	CO6	Think logically, to assess competing principles impartially and to identify and solve legal and ethical problems
FAMILY LAW I 10BA0305	CO1	Have conceptual clarity about marriage, divorce, parental custody, domestic abuse and children's rights.
	CO2	Understand the establishment, composition and powers of family Courts.

	CO3	Understand and address the various issues and problems of adoption and maintenance.
	CO4	Understand the provisions of guardianship and minority
	CO5	Have clarity about Muslim Laws covering both codified and unmodified part.
CONSTITUTIONAL LAW I 10BA0306	CO1	Understand the meaning nature and salient features of the Constitution of India.
	CO2	Understand the jurisprudence of the fundamental freedoms guaranteed to the citizens of India
	CO3	Learn the Fundamental rights and duties guaranteed by the constitution
	CO4	Acquire a basic knowledge of the constitutional remedies in case of violation of fundamental rights
	CO5	Study the interrelationship between fundamental rights, fundamental duties and Directive principles of state policy and their role in achieving the constitutional goals
	CO6	Analyse the case law critically in the context of the ideal of a welfare state
LAW OF CRIMES - I (IPC) (GENERAL PRINCIPLES) 10BA0307	CO1	Shall develop a conceptual understanding of the basics principles of law of crime
	CO2	Shall be able to understand different elements and stages of crime.
	CO3	Shall be able to analyze about criminal liability and inchoate crime
	CO4	Shall also learn about the general defenses available to a criminal.
INTERNSHIP (LOWER COURT I) 4 WEEKS 10BA0308	CO1	Understand the basic requirement of depth knowledge of the subject matter in a case.
	CO2	Analyse the most basic legal cases.
	CO3	Create an alignment of curriculum with enormous practical exposure.
LANGUAGE (BASICS OF FRENCH LANGUAGE FRENCH - I)	CO1	The learner will be able to use basic greetings in the French language.
	CO2	The learner will be able to use genders, numbers and articles in the French language.

10SL0301	CO3	The learner will have the basic vocabulary to have communication in the French language.
<b>Course Outcomes for the Second Year Fourth Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE IV (INDIAN POLITICAL THOUGHT) 10BA0409	CO1	Label and Outline the Indian Political thought.
	CO2	Examine and Determine historical narratives and its impact on the thought process of that particular era.
	CO3	Create and Develop their spectrum of thoughts wider with a holistic viewpoint
	CO4	Organize and Simplify the Contemporary Notions of Thought Processes in Indian Polity and Society.
PUBLIC INTERNATIONAL LAW 10FL0401	CO1	To know and understand the role of Public International Law in the modern day society
	CO2	To know and understand the role of Public International Law in the modern-day society
	CO3	To evaluate the importance of Public International Law in following a code of conduct by the states.
ENVIRONMENT LAW 10FL0402	CO1	Shall develop a conceptual understanding of the environmental concern, world over.
	CO2	Acquire a clear knowledge of various laws, nationally and internationally,
	CO3	Shall be able to evaluate, analyze and assess the laws and its practical application.
	CO4	Shall also endeavor to find out the changing positions of world with respect to tackling the threat posed by environmental degradation.
	CO5	To exhibit memory on Environment, Nature and Ecosystem concepts.
	CO6	To demonstrate understanding of International Environmental Conventions.
FAMILY LAW II 10FL0403	CO1	Describe various concepts and institutions under family law, i.e., JHF, HUF, wakf and religious Endowment.

	CO2	State the law and procedures of intestate succession.
	CO3	Compare right to property of women under different Religious and Statutory Law.
	CO4	Relate testamentary succession under various religious and statutory Law.
	CO5	Interpret the right of pre-emption under various personal laws.
	CO6	Develop Wakf and other Religious Endowment.
	CONSTITUTIONAL LAW II 10FL0404	CO1
CO2		To compare and contrast the different organs of the Government.
CO3		To identify the role, power and function of President, Council of ministers and its responsibility
CO4		To analyse the role of legislature and also the distribution of legislative powers between Union and State; Indian Judicial System, various types of emergency and effects
CO5		To evaluate the legislative, administrative functions of the Government.
CO6		Develop the higher thinking order in relation to the basic structure theory as restriction on amending power of the parliament.
LAW OF CRIMES - II (IPC) (SPECIFIC OFFENCES) 10FL0405	CO1	Understand the specific offences under IPC
	CO2	Know the essential ingredients of specific offences
	CO3	Analyse different offences against Human Body such as Murder and Rape, against Property such as theft, Extortion, robbery, dacoity etc.
	CO4	Assess and develop a higher thinking order relating to the criminal legal system administration and justice
INTERNSHIP (LOWER COURT 2) 4 WEEKS 10FL0406	CO1	Understand the basic requirement of depth knowledge of the subject matter in a case.
	CO2	Analyse the most basic legal cases.
	CO3	Create an alignment of curriculum with enormous practical exposure.

LANGUAGE (BASICS OF FRENCH LANGUAGE FRENCH - II) 10SL0402	CO1	The students will get basic exposure to the French language and they will be able to read basic instructions in French.
	CO2	The students will get basic exposure to the French language and they will be able to ask basic questions in French.
	CO3	The students will get basic exposure to the French language and they will be able to answer basic questions in French.
<b>Course Outcomes for the Third Year Fifth Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE V (COMPARATIVE GOVERNMENT & POLITICS) 10BA0502	CO1	Define and Relate the key concepts, nature, scope, methods and significance of Comparative Government and Politics
	CO2	Identify and Classify Political Systems and Regimes
	CO3	Examine different Electoral Systems in a Democratic Regime or a Political System
	CO4	Appraise contemporary debates on the changing nature of nation-state
HUMAN RIGHTS & INTERNATIONAL HUMANITARIAN LAW 10FL0501	CO1	To be able to define the concept of jus in bello and jus ad bellum
	CO2	To be able to demonstrate the principle of proportionality, precaution and distinction
	CO3	To be able to identify the meaning of customary international law in International Human rights law and International Humanitarian Law.
	CO4	To compare the International Humanitarian Law and Human Rights Law
	CO5	To be able to explain the law regarding warfare and the modern developments in it.
	CO6	To be able to able to develop a critical thinking regarding the International humanitarian law and human rights law
CRIMINAL PROCEDURE CODE 10FL0502	CO1	Identify the stages in investigation and procedure of trial in criminal cases
	CO2	Explain the powers, functions, and duties of police and criminal courts.



	CO3	Understand the provisions relating to maintenance of Wife, Children and Parents.
CORPORATE LAW I 10FL0503	CO1	To recall basic concepts and Characteristics of company
	CO2	To demonstrate Incorporation procedure and its Consequences
	CO3	To apply provisions relating to various prospectus and types of share issuance.
	CO4	To classify and compare various types of debentures
	CO5	To evaluate membership and modes of acquiring membership
	CO6	To formulate high standards relating to the directors and key managerial personals.
LAW OF EVIDENCE 10FL0504	CO1	Understand evidence that is admissible before the court of law
	CO2	Know the difference between admissible and inadmissible evidence
	CO3	Apply legal provisions to the problem in front of them with regards to admissibility of evidence
	CO4	Analyze the kinds of evidence and their admissibility under different sections of Indian Evidence Act
	CO5	Assess and develop a higher thinking order in legal proceedings
ADMINISTRATIVE LAW 10FL0505	CO1	Define the meaning and scope of administrative law and delegated legislation
	CO2	State the principles of natural justice.
	CO3	Explain administrative adjudication.
	CO4	Discuss administrative discretion and remedies.
	CO5	Interpret the liability of administration.
	CO6	Compare administrative process and judicial review.
LEGAL WRITING (ENRICHMENT COURSE) 10FL0506	CO1	To understand the meaning and scope of legal writing and Legal English
	CO2	To be able to identify the different paradigms of legal writing
	CO3	To be able to demonstrate, scope and forms of research
	CO4	To be able to analyse the ethical standards in legal writing
	CO1	Identify and articulate legal issues in the context

INTERNSHIP (HIGH COURT 1) 4 WEEKS 10FL0507	CO2	Chose and implement an effective strategy, selecting and employing authoritative resources to locate relevant legal authority
	CO3	To compare various rules and regulations.
	CO4	To identify Alternative dispute settlement.
	CO5	To analyze court objectives, power, functions and penalties.
	CO6	To analyze court objectives, power, functions of Judicial System
<b>Course Outcomes for the Third Year Sixth Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE VI (WESTERN POLITICAL THOUGHT) 10BA0601	CO1	Define and Relate the principal modes of political thought in the West.
	CO2	Outline political thought through the Classical, Renaissance, and Enlightenment periods based on the works of Plato, Aristotle, Machiavelli, Hobbes, Locke, Rousseau, Tocqueville, and Marx.
	CO3	Dissect the differences between Plato and Aristotle with regard to their understandings of the nature of the person, ethics, society, citizenship, and governance.
	CO4	Measure the historical and intellectual context in which the western political thought helped to develop the modern nation-state.
LABOUR & INDUSTRIAL LAW I 10FL0601	CO1	Understand the labour legislation and various other provisions thereby
	CO2	Apply the knowledge of various labour laws and become aware of the rights and responsibilities of the management and especially workmen and trade unions, compliance and penalties under provided under the labour laws
	CO3	Analyze the scope and objectives of labour laws and enable students to understand the reforms required in the law to cope up the recent developments taking place
	CO4	Assess and develop a higher thinking order relating to the labour administration and justice

<p>INTERPRETATION OF STATUTES 10FL0602</p>	CO1	On completion of this course, students will be able to To know and understand the concept of Interpretation and its difference with construction.
	CO2	To be able to demonstrate the different rules of interpretation
	CO3	To apply the relevancy of various principles of interpretation
	CO4	To be able to analyse the internal aids to construction and external aids to construction.
	CO5	To evaluate the roles of judiciary along with extent in ascertaining meaning of any statute and to develop a higher thinking order through identifying the new judicial trend.
	CO6	To be able to elaborate on the interpretation of constitution and its importance.
<p>CORPORATE LAW II 10FL0603</p>	CO1	To define the basic concepts & procedure of corporate administration.
	CO2	To compare among inspection, inquiry and investigation of a company
	CO3	To evaluate Compromises, Arrangements and Amalgamations and their procedural aspect
	CO4	To identify Prevention of Oppression and Mismanagement through case laws
	CO5	To analyse Offences, Penalties and their compounding nature.
	CO6	To elaborate the procedure & reasons for winding up & To formulate the jurisdiction and application of National Company Law Tribunal and Appellate Tribunal on the dispute on corporate affairs of company.
<p>CIVIL PROCEDURE CODE &amp; LIMITATION ACT 10FL0604</p>	CO1	State the detail procedure for redressal of civil rights.
	CO2	Identify the place of suing, procedure for institution of suit, the documents in support and against, evidence taking and trial, dimensions of an interim order, the peculiar nature of the suits, the complexities of executing a decree and provisions for appeal and revision.
	CO3	Analyze the procedural requirement to initiate trail of civil civil Describe Parties of suits, Institution and Trial of suit.
	CO4	Execute Complaint and written statement.

	CO5	Compare Suits, Appeals, Review and Reference.
	CO6	Relate the law of limitation to civil proceedings.
PROPERTY LAW 10FL0605	CO1	On completion of this course, students will be able to define the various kinds of properties.
	CO2	Describe the principles of transfer of property applicable to both movable and immovable properties.
	CO3	Identify the principles applicable to Transfer of Immovable Property
	CO4	Relate the provisions of Sale and Mortgage.
	CO5	Relate the provisions of Charge and lease.
	CO6	Interpret provisions of Gift, Actionable Claim and Indian Easement Act
INTELLECTUAL PROPERTY LAW 10FL0606	CO1	To exhibit memory on the basic concept of IP rights.
	CO2	To Compare product/process patents and relating rules.
	CO3	To identify trademarks & geographical indications and their application.
	CO4	To examine the provisions relating to the Copyright.
	CO5	To appraise importance of industrial designs by interpreting judicial decisions.
	CO6	To imagine the consequences of non-protection of trade secrets & key business concerns in commercializing intellectual property.
INTERNSHIP HIGH COURT 2) 4 WEEKS 10FL0607	CO1	To define the basic concepts & procedure of court proceeding.
	CO2	To evaluate various legal matters present in society and its regulations
	CO3	To compare various rules and regulations.
	CO4	To identify Alternative dispute settlement.
	CO5	To analyze court objectives, power, functions and penalties.
	CO6	To elaborate the court procedure, power, functions and penalties.

## Course Outcomes (COs) for Batch 2020-25

<b>Course Outcomes for the First Year First Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE I 10BA0101	CO1	Thorough understanding of the key concepts of Political science
	CO2	They will be able to describe and analyse the core concepts of politics
	CO3	They would understand the discipline's terminology and methods
	CO4	They will also be able to explore instances of applied political science through real world examples
ECONOMICS I 10BA0102	CO1	Develop acquaintance with the functioning of various Micro concepts in the real world phenomenon.
	CO2	Analyse various legal and economic issues and which are often found to be strongly associated with each other and develop meaningful solutions for the same
	CO3	Comprehend the structural framework and functioning of various Laws and Acts which are built upon various Economic Theories and Principles
SOCIOLOGY I 10BA0103	CO1	understand and appreciate the social institutions and organizations.
	CO2	apply sociological concepts and will be able to relate with society.
	CO3	examine social problems and evaluate its various dimensions.
LEGAL METHODS 10BA0105	CO1	Understand the concept, sources and the functions of law and various legal systems of the world.
	CO2	Understand the hierarchy of the Indian courts and their jurisdictions
	CO3	Understand judicial reasoning and its application in the Courts
	CO4	Acquire the ability to identify legal issues and principles underlying in any given factual situation and to undertake and present research on such issues
	CO5	Equip with the basics of legal research methodology and legal writing
	CO1	Develop a conceptual understanding of the basics of law of contract.

LAW OF CONTRACT – I (GENERAL PRINCIPLES) 10BA0106	CO2	Understand the legal aspects of a valid contract and at the same time judge a void and voidable contract.
	CO3	Learn the remedies available in cases of breach of contract
	CO4	Have conceptual understanding of E-contracts, and government Contracts.
	CO5	Develop strong analytical skills
CRITICAL THINKING & ARGUMENTATIVE SKILLS 10CR0101	CO1	Identify the differences between fact and opinion.
	CO2	Identify, compose and refute propositions of fact, value and policy.
	CO3	To understand the methods of analyzing evidences in order to organize, deliver and critique effective arguments and rebuttals.
	CO4	Analyze and utilize formal and informal logic to construct arguments which advocate or defend position(s).
ENGLISH – I (LINGUISTICS AND LITERATURE) 10SL0101	CO1	The students will get the necessary training in language skills and they will be able to develop and enhance their listening skills for various purposes
	CO2	The students will get the necessary training in language skills and they will be able to understand and use written and spoken language in context.
	CO3	The students will get the necessary training in language skills and they will be able to comprehend, compare and differentiate between various written texts/documents
	CO4	The students will get the necessary training in language skills and they will be able to evolve appropriate writing competence.
<b>Course Outcomes for the First Year Second Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE II (INTERNATIONAL RELATIONS)	CO1	Define the diverse politico-legal, socio-economic and cultural aspects of globalized world that affect the global decision-making process

10BA0209	CO2	Compare and Classify critically the process of International Politics and Relations in the backdrop of Globalization
	CO3	Build over the various aspects of International and global problems and conflict situations of the contemporary world
	CO4	Demonstrate the effects of Post Cold War Order onto International Politics
	CO5	Determine the Efficacy of International and Global Organizations
ECONOMICS II (MACROECONOMICS) 10BA0210	CO1	Define the functioning of Macroeconomic concepts in the real-world phenomenon.
	CO2	Explain the functioning of Macroeconomic concepts in the real-world phenomenon
	CO3	Demonstrate various economic issues and come up with meaningful solutions to the economic problems
	CO4	Analyze and evaluate the private and public sector banking in India
	CO5	Develop the structural framework and functioning of various Laws and Acts which are built upon Macroeconomic Theories and Principles.
SOCIOLOGY II (INDIAN SOCIETY AND LAW: AN INTERFACE) 10BA0211	CO1	Define conceptual meanings on Indian society.
	CO2	Describe theoretical orientation on Indian social institutions.
	CO3	Demonstrate the unequal practices phenomena prevalent in Indian society
	CO4	Theorize the unequal practices phenomena prevalent in Indian society.
	CO5	Formulate theories on how legal institutions operate in relation to social institutions.
	CO6	Establish socio-legal issues and challenges of Indian society.
LAW OF TORTS, CONSUMER PROTECTION ACT, 1986 & MOTOR VEHICLE ACT, 1988 10FL0201	CO1	On completion of this course, students will be able to state the meaning and nature of the Law of Torts.
	CO2	On completion of this course, students will be able to describe the liability for the Wrong Committed by Other Person

	CO3	On completion of this course, students will be able to describe Negligence, Contributory Negligence and Nuisance.	
	CO4	On completion of this course, students will be able to interpret General Defenses for the Tortious Liability.	
	CO5	On completion of this course, students will be able to relate Torts Against Human Being and Property.	
	CO6	On completion of this course, students will be able to criticize the liabilities based on fault & Remedies.	
	CO7	Describe The Consumer Protection Act, 2019	
	CO8	Describe Motor Vehicle Act, 1988.	
	LAW OF CONTRACT – II 10FL0202	CO1	To recall concepts of contract to special contracts
		CO2	To demonstrate understanding on various principles relating to Contract of Indemnity & Guarantee.
CO3		To experiment with principles and provisions on Bailment & Pledge.	
CO4		To examine the principle of agency in practice	
CO5		To evaluate the difference between Partnership & Limited Liability Partnership Act and benefits.	
CO6		To formulate the modern contract technique and develop new drafting skills in the Sale of Goods Act 1930 with Amendments.	
MOOT COURT TRAINING 10FL0203	CO1	Present this argument articulately and clearly in an oral format	
	CO2	Research the law relevant to these legal issues;	
	CO3	Identify the legal issues arising from a hypothetical set of facts	
	CO4	Formulate legal argument based on this research	
	CO5	Apply the law accurately and persuasively	
	CO6	Distinguish any case law which runs contrary to the argument being made	
INTERNSHIP (NGO) 10FL0204	CO1	Understand the nuances of social reality	
	CO2	Identify the social issues facing by the people in society	



	CO3	Create an ambiance for amelioration of the issues related to society
LAW THROUGH POPULAR MEDIA 10SL0152	CO1	Understand and analyze the different courtroom situations in a critical manner
	CO2	Use legal language with reference to a particular context
	CO3	Create an argument critically in the field of Law
	<b>Course Outcomes for the Second Year Third Semester Course</b>	
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE III (PUBLIC ADMINISTRATION, LAW AND GOVERNANCE) 10BA0310	CO1	Illustrate the working of public administration
	CO2	Assess and Examine the processes of governance and relate it with public administration theories
	CO3	Make an Estimate of the contemporary bureaucratic forms
	CO4	Identify the Relationship between Law and Governance
ECONOMICS III 10BA0311	CO1	Define economic growth and development.
	CO2	Policy formulation in context of India vis-à-vis their comparison with other nations.
	CO3	Explain the issues and challenges faced by the Indian Economy.
	CO4	Demonstrate the segmentation of the Indian Economy.
	CO5	Appraise human capital formation.
	CO6	Assess the evolution of planning and flagship programmes in India & establish the interface between economy, environment and development.
SOCIOLOGY III (LAW IN A CHANGING SOCIETY: CHALLENGES & PROSPECTS) 10BA0312	CO1	State the multiple dimensions of the concept of law.
	CO2	Explain the theoretical underpinnings of the concept of law
	CO3	Demonstrate theories & trends of social change.
	CO4	Analyze the relationships between legal system and social change.
	CO5	Appraise law as social processes.
	CO6	Assess the systematic patterns and consequences of law in changing society, especially Indian society & also Establish how law affects society and vice versa.

<b>JURISPRUDENCE</b> 10FL0301	CO1	To be able to relate to the different aspects of jurisprudence as a field of study.
	CO2	Interpret and assess competing philosophical and ethical perspectives on law, and to use those perspectives to formulate arguments about law, politics and ethics.
	CO3	Identify the critically key jurisprudential issues.
	CO4	Analyse and reason the legal and moral arguments, by way of both oral and written presentation.
	CO5	Evaluate a concise and appropriately structured report addressing a key jurisprudential issue.
	CO6	Develop and formulate theses and summarize legal and ethical perspectives.
<b>FAMILY LAW I</b> 10FL0302	CO1	State origin, types, classification of families and personal laws.
	CO2	Identify the various modes of marriages under different personal laws.
	CO3	Describe the establishment, composition and powers of family Courts.
	CO4	Interpret the provisions of guardianship and minority.
	CO5	Criticize various issues and problems of adoption and maintenance.
	CO6	Develop the various legal provisions as well as judgments of Supreme Court and High Courts.
<b>CONSTITUTIONAL LAW I</b> 10FL0303	CO1	On completion of this course, students will be able define the meaning nature and salient features of the Constitution of India
	CO2	To be able to demonstrate the jurisprudence of the fundamental freedoms guaranteed to the citizens of India
	CO3	To be able to develop and solve problems relating to the Fundamental rights and duties guaranteed by the constitution
	CO4	To be able to analyze the basic knowledge of the constitutional remedies in case of violation of fundamental rights

	CO5	To be able to explain the interrelationship between fundamental rights, fundamental duties and Directive principles of state policy and their role in achieving the constitutional goals
	CO6	To be able to elaborate on the case law critically in the context of the ideal of a welfare state
LAW OF CRIMES - I (IPC) (GENERAL PRINCIPLES) 10FL0304	CO1	Understanding of the basic principles of law of crime
	CO2	Know different elements and stages of crime
	CO3	Apply legal provisions to the problem in front of them with regards to offenses
	CO4	Analyze about criminal liability and inchoate crime
	CO5	Assess and develop a higher thinking order relating to the administration criminal justice
INTERNSHIP (LOWER COURT I) 4 WEEKS 10FL0306	CO1	Understand the basic requirement of depth knowledge of the subject matter in a case.
	CO2	Analyse the most basic legal cases.
	CO3	Create an alignment of curriculum with enormous practical exposure.
LANGUAGE (BASICS OF FRENCH LANGUAGE FRENCH - I) 10SL0302	CO1	The students will get basic exposure to the French language and they will be able to use basic greetings.
	CO2	The students will get basic exposure to the French language and they will be able to introduce themselves in French language.
	CO3	The students will get basic exposure to the French language and they will be able to understand basic conversations in French language.
<b>Course Outcomes for the Second Year Fourth Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE IV (INDIAN POLITICAL THOUGHT)	CO1	Label and Outline the Indian Political thought.
	CO2	Examine and Determine historical narratives and its impact on the thought process of that particular era.

10BA0409	CO3	Create and Develop their spectrum of thoughts wider with a holistic viewpoint.
	CO4	Organize and Simplify the Contemporary Notions of Thought Processes in Indian Polity and Society.
	CO5	To make their spectrum of thoughts wider
PUBLIC INTERNATIONAL LAW 10FL0401	CO1	To know and understand the role of Public International Law in the modern day society
	CO2	To know and understand the role of Public International Law in the modern-day society
	CO3	To evaluate the importance of Public International Law in following a code of conduct by the states.
ENVIRONMENT LAW 10FL0402	CO1	Shall develop a conceptual understanding of the environmental concern, world over.
	CO2	Acquire a clear knowledge of various laws, nationally and internationally,
	CO3	Shall be able to evaluate, analyze and assess the laws and its practical application.
	CO4	Shall also endeavor to find out the changing positions of world with respect to tackling the threat posed by environmental degradation.
	CO5	To exhibit memory on Environment, Nature and Ecosystem concepts.
	CO6	To demonstrate understanding of International Environmental Conventions.
FAMILY LAW II 10FL0403	CO1	Describe various concepts and institutions under family law, i.e., JHF, HUF, wakf and religious Endowment.
	CO2	State the law and procedures of intestate succession.
	CO3	Compare right to property of women under different Religious and Statutory Law.
	CO4	Relate testamentary succession under various religious and statutory Law.
	CO5	Interpret the right of pre-emption under various personal laws.

	CO6	Develop Wakf and other Religious Endowment.
CONSTITUTIONAL LAW II 10FL0404	CO1	To be able to define the role of the Indian Legislature both the Union and the State
	CO2	To compare and contrast the different organs of the Government.
	CO3	To identify the role, power and function of President, Council of ministers and its responsibility
	CO4	To analyse the role of legislature and also the distribution of legislative powers between Union and State; Indian Judicial System, various types of emergency and effects
	CO5	To evaluate the legislative, administrative functions of the Government.
	CO6	Develop the higher thinking order in relation to the basic structure theory as restriction on amending power of the parliament.
LAW OF CRIMES - II (IPC) (SPECIFIC OFFENCES) 10FL0405	CO1	Understand the specific offences under IPC
	CO2	Know the essential ingredients of specific offences
	CO3	Analyse different offences against Human Body such as Murder and Rape, against Property such as theft, Extortion, robbery, dacoity etc.
	CO4	Assess and develop a higher thinking order relating to the criminal legal system administration and justice
INTERNSHIP (LOWER COURT 2) 4 WEEKS 10FL0406	CO1	Understand the basic requirement of depth knowledge of the subject matter in a case.
	CO2	Analyse the most basic legal cases.
	CO3	Create an alignment of curriculum with enormous practical exposure.
LANGUAGE (BASICS OF FRENCH LANGUAGE FRENCH - II) 10SL0402	CO1	The students will get basic exposure to the French language and they will be able to read basic instructions in French.
	CO2	The students will get basic exposure to the French language and they will be able to ask basic questions in French.

	CO3	The students will get basic exposure to the French language and they will be able to answer basic questions in French.
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## Course Outcomes (COs) for Batch 2021-26

<b>Course Outcomes for the First Year First Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE I 10BA0101	CO1	Thorough understanding of the key concepts of Political science
	CO2	They will be able to describe and analyse the core concepts of politics
	CO3	They would understand the discipline's terminology and methods
	CO4	They will also be able to explore instances of applied political science through real world examples
ECONOMICS I 10BA0102	CO1	Develop acquaintance with the functioning of various Micro concepts in the real world phenomenon.
	CO2	Analyse various legal and economic issues and which are often found to be strongly associated with each other and develop meaningful solutions for the same
	CO3	Comprehend the structural framework and functioning of various Laws and Acts which are built upon various Economic Theories and Principles
SOCIOLOGY I 10BA0103	CO1	understand and appreciate the social institutions and organizations.
	CO2	apply sociological concepts and will be able to relate with society.
	CO3	examine social problems and evaluate its various dimensions.
LEGAL METHODS 10FL0101	CO1	Understand the concept, sources and the functions of law and various legal systems of the world.
	CO2	Understand the hierarchy of the Indian courts and their jurisdictions
	CO3	Understand judicial reasoning and its application in the Courts
	CO4	Acquire the ability to identify legal issues and principles underlying in any given factual situation and to undertake and present research on such issues
	CO5	Equip with the basics of legal research methodology and legal writing
	CO1	Develop a conceptual understanding of the basics of law of contract.

LAW OF CONTRACT – I (GENERAL PRINCIPLES) 10BA0106	CO2	Understand the legal aspects of a valid contract and at the same time judge a void and voidable contract.
	CO3	Learn the remedies available in cases of breach of contract
	CO4	Have conceptual understanding of E-contracts, and government Contracts.
	CO5	Develop strong analytical skills
CRITICAL THINKING & ARGUMENTATIVE SKILLS 10CR0101	CO1	Identify the differences between fact and opinion.
	CO2	Identify, compose and refute propositions of fact, value and policy.
	CO3	To understand the methods of analyzing evidences in order to organize, deliver and critique effective arguments and rebuttals.
	CO4	Analyze and utilize formal and informal logic to construct arguments which advocate or defend position(s).
ENGLISH – I (LINGUISTICS AND LITERATURE) 10SL0101	CO1	The students will get the necessary training in language skills and they will be able to develop and enhance their listening skills for various purposes
	CO2	The students will get the necessary training in language skills and they will be able to understand and use written and spoken language in context.
	CO3	The students will get the necessary training in language skills and they will be able to comprehend, compare and differentiate between various written texts/documents
	CO4	The students will get the necessary training in language skills and they will be able to evolve appropriate writing competence.
<b>Course Outcomes for the First Year Second Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
POLITICAL SCIENCE II (INTERNATIONAL RELATIONS)	CO1	Define the diverse politico-legal, socio-economic and cultural aspects of globalized world that affect the global decision-making process



10BA0209	CO2	Compare and Classify critically the process of International Politics and Relations in the backdrop of Globalization
	CO3	Build over the various aspects of International and global problems and conflict situations of the contemporary world
	CO4	Demonstrate the effects of Post Cold War Order onto International Politics
	CO5	Determine the Efficacy of International and Global Organizations
ECONOMICS II (MACROECONOMICS) 10BA0210	CO1	Define the functioning of Macroeconomic concepts in the real-world phenomenon.
	CO2	Explain the functioning of Macroeconomic concepts in the real-world phenomenon
	CO3	Demonstrate various economic issues and come up with meaningful solutions to the economic problems
	CO4	Analyze and evaluate the private and public sector banking in India
	CO5	Develop the structural framework and functioning of various Laws and Acts which are built upon Macroeconomic Theories and Principles.
SOCIOLOGY II (INDIAN SOCIETY AND LAW: AN INTERFACE) 10BA0211	CO1	Define conceptual meanings on Indian society.
	CO2	Describe theoretical orientation on Indian social institutions.
	CO3	Demonstrate the unequal practices phenomena prevalent in Indian society
	CO4	Theorize the unequal practices phenomena prevalent in Indian society.
	CO5	Formulate theories on how legal institutions operate in relation to social institutions.
	CO6	Establish socio-legal issues and challenges of Indian society.
LAW OF TORTS, CONSUMER PROTECTION ACT, 1986 & MOTOR VEHICLE ACT, 1988 10FL0201	CO1	On completion of this course, students will be able to state the meaning and nature of the Law of Torts.
	CO2	On completion of this course, students will be able to describe the liability for the Wrong Committed by Other Person

	CO3	On completion of this course, students will be able to describe Negligence, Contributory Negligence and Nuisance.	
	CO4	On completion of this course, students will be able to interpret General Defenses for the Tortious Liability.	
	CO5	On completion of this course, students will be able to relate Torts Against Human Being and Property.	
	CO6	On completion of this course, students will be able to criticize the liabilities based on fault & Remedies.	
	CO7	Describe The Consumer Protection Act, 2019	
	CO8	Describe Motor Vehicle Act, 1988.	
	LAW OF CONTRACT – II 10FL0202	CO1	To recall concepts of contract to special contracts
		CO2	To demonstrate understanding on various principles relating to Contract of Indemnity & Guarantee.
CO3		To experiment with principles and provisions on Bailment & Pledge.	
CO4		To examine the principle of agency in practice	
CO5		To evaluate the difference between Partnership & Limited Liability Partnership Act and benefits.	
CO6		To formulate the modern contract technique and develop new drafting skills in the Sale of Goods Act 1930 with Amendments.	
MOOT COURT TRAINING 10FL0203	CO1	Present this argument articulately and clearly in an oral format	
	CO2	Research the law relevant to these legal issues;	
	CO3	Identify the legal issues arising from a hypothetical set of facts	
	CO4	Formulate legal argument based on this research	
	CO5	Apply the law accurately and persuasively	
	CO6	Distinguish any case law which runs contrary to the argument being made	
INTERNSHIP (NGO) 10FL0204	CO1	Understand the nuances of social reality	
	CO2	Identify the social issues facing by the people in society	

	CO3	Create an ambiance for amelioration of the issues related to society
LAW THROUGH POPULAR MEDIA 10SL0152	CO1	Understand and analyze the different courtroom situations in a critical manner
	CO2	Use legal language with reference to a particular context
	CO3	Create an argument critically in the field of Law

## B.Com.LL.B.(Hons.)

### Course Outcomes (COs) for Batch 2018-23

<b>Course Outcomes for the First Year First Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
PRINCIPLES OF BUSINESS ADMINISTRATION 10BC0101	CO1	Introduction to Management
	CO2	Planning in Management
	CO3	Awareness about Organizing and various structures
	CO4	Importance of Directing in Management
	CO5	Importance of controlling and its various methods
BUSINESS ENVIRONMENT 10BC0102	CO1	Introduction to Business Economics
	CO2	Awareness about Economic and Political Environment
	CO3	Introduction to Legal Framework
	CO4	Awareness about Legal Technological Environment
	CO5	Introduction to Social Environment
PRINCIPLES OF ACCOUNTING 10BC0103	CO1	Implement the accounting process from journal entries to trial balance
	CO2	Understand the need for uniformity in accounting
	CO3	Prepare financial statements of sole-proprietary business
LEGAL METHODS 10BC0105	CO1	Understand the concept, sources and the functions of law and various legal systems of the world.
	CO2	Understand the hierarchy of the Indian courts and their jurisdictions

	CO3	Understand judicial reasoning and its application in the Courts
	CO4	Acquire the ability to identify legal issues and principles underlying in any given factual situation and to undertake and present research on such issues
	CO5	Equip with the basics of legal research methodology and legal writing
LAW OF CONTRACT – I (GENERAL PRINCIPLES) 10BC0106	CO1	Develop a conceptual understanding of the basics of law of contract.
	CO2	Understand the legal aspects of a valid contract and at the same time judge a void and voidable contract.
	CO3	Learn the remedies available in cases of breach of contract
	CO4	Have conceptual understanding of E-contracts, and government Contracts.
	CO5	Develop strong analytical skills
CRITICAL THINKING & ARGUMENTATIVE SKILLS 10CR0101	CO1	Identify the differences between fact and opinion.
	CO2	Identify, compose and refute propositions of fact, value and policy.
	CO3	To understand the methods of analyzing evidences in order to organize, deliver and critique effective arguments and rebuttals.
	CO4	Analyze and utilize formal and informal logic to construct arguments which advocate or defend position(s).
	CO5	Utilize ethical communication when developing arguments while simultaneously taking into consideration diverse audiences.
ENGLISH – I (LINGUISTICS AND LITERATURE) 10SL0101	CO1	The students will get the necessary training in language skills and they will be able to develop and enhance their listening skills for various purposes
	CO2	The students will get the necessary training in language skills and they will be able to understand and use written and spoken language in context.
	CO3	The students will get the necessary training in language skills and they will be able to comprehend, compare and differentiate between various written texts/documents
	CO4	The students will get the necessary training in language skills and they will be able to evolve appropriate writing competence.

<b>Course Outcomes for the First Year Second Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
BUSINESS COMMUNICATION 10BC0201	CO1	Inculcate formal reading and writing skills required to communicate with colleagues in the workplace.
	CO2	Writing effective business letters, reports.
BUSINESS ECONOMICS 10BC0202	CO1	The students will have basic understanding of microeconomics
	CO2	Understand the concept of consumer behaviour
	CO3	To enable the students to understand demand and supply relationship
	CO4	The students will have basic understanding of production and cost analysis
	CO5	To simplify the equilibrium of firm and industry
ADVANCED ACCOUNTING PRINCIPLE 10BC0203	CO1	Address advanced accounting issues of partnership firm
	CO2	Understand the difference between hire purchase and installment purchase transactions
	CO3	Classify the branches and do the accounting accordingly and demonstrate knowledge of the concept of Ex-interest and Cum-interest
LAW OF TORTS, CONSUMER PROTECTION ACT, 1986 & MOTOR VEHICLE ACT, 1988 10BC0204	CO1	Understand the concept of torts, its essentials and kinds with defences.
	CO2	Differentiate between the tortuous liability, criminal liability and contractual liability.
	CO3	Safeguard the rights and interest of consumers which they can enforce under the provisions of The Consumer Protection Act, 1986.
	CO4	Understand the justice dispensation system under The Consumer Protection Act, 1986.
	CO5	Learn the basic forms of no fault liabilities and insurance policies which will enable students to help an aggrieved get the appropriate remedy provided under the existing laws.
LAW OF CONTRACT – II	CO1	To recall concepts of contract to special contracts

10BC0205	CO2	To demonstrate understanding on various principles relating to Contract of Indemnity & Guarantee.
	CO3	To experiment with principles and provisions on Bailment & Pledge.
	CO4	To examine the principle of agency in practice
	CO5	To evaluate the difference between Partnership & Limited Liability Partnership Act and benefits.
	CO6	To formulate the modern contract technique and develop new drafting skills in the Sale of Goods Act 1930 with Amendments.
MOOT COURT TRAINING 10BC0206	CO1	Identify the legal issues arising from a hypothetical set of facts
	CO2	Research the law relevant to these legal issues
	CO3	Formulate legal argument based on this research
	CO4	Apply the law accurately and persuasively
	CO5	Distinguish any case law which runs contrary to the argument being made
	CO6	Present this argument articulately and clearly in an oral format
INTERNSHIP (NGO) 10BC0207	CO1	Understand the nuances of social reality
	CO2	Identify the social issues facing by the people in society
	CO3	Create an ambiance for amelioration of the issues related to society
LAW THROUGH POPULAR MEDIA 10SL0151	CO1	Understand and analyze the different courtroom situations in a critical manner
	CO2	Use legal language with reference to a particular context
	CO3	Create an argument critically in the field of Law
<b>Course Outcomes for the Second Year Third Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
FINANCIAL ACCOUNTING 10BC0301	CO1	Able to understand basic of various techniques inventory management
	CO2	Clear understanding of various cost
	CO3	Understanding of importance of preparing subsidiary books
	CO4	Understand purpose of preparing bank reconciliation statements
	CO5	Conceptual understanding of final accounts and financial statement analysis

FUNDAMENTALS OF ENTREPRENEURSHIP 10BC0302	CO1	Awareness about various concepts of entrepreneurship
	CO2	Awareness about preparing a good business plan.
	CO3	Enhanced knowledge of students of various sources of finance in for entrepreneurship
	CO4	Visualization of the criteria of Large Scale, Small Scale and Cottage Industries.
	CO5	Learning through real life examples of entrepreneurship
HUMAN RESOURCE MANAGEMENT 10BC0303	CO1	Awareness about basics of Human Resource Management
	CO2	Exploration techniques of procurement of human resource
	CO3	Visualization various training techniques used for human resource
	CO4	Enhancement of knowledge of through various concepts of compensation and maintenance
	CO5	Insights of industrial relations
JURISPRUDENCE 10BC0304	CO1	Interpret and assess competing philosophical and ethical perspectives on law, and to use those perspectives to formulate arguments about law, politics and ethics.
	CO2	Identify and analyze critically key jurisprudential issues.
	CO3	Engage in and cultivate reasoned legal and moral arguments, by way of both oral and written presentation.
	CO4	Produce (by a specified deadline) a concise and appropriately structured report addressing a key jurisprudential issue.
	CO5	Carry out literature reviews, formulate theses and summarize legal and ethical perspectives.
	CO6	Think logically, to assess competing principles impartially and to identify and solve legal and ethical problems
FAMILY LAW I 10BC0305	CO1	Have conceptual clarity about marriage, divorce, parental custody, domestic abuse and children's rights.



	CO2	Understand the establishment, composition and powers of family Courts.
	CO3	Understand and address the various issues and problems of adoption and maintenance.
	CO4	Understand the provisions of guardianship and minority
	CO5	Have clarity about Muslim Laws covering both codified and unmodified part.
CONSTITUTIONAL LAW I 10BC0306	CO1	Understand the meaning nature and salient features of the Constitution of India.
	CO2	Understand the jurisprudence of the fundamental freedoms guaranteed to the citizens of India
	CO3	Learn the Fundamental rights and duties guaranteed by the constitution
	CO4	Acquire a basic knowledge of the constitutional remedies in case of violation of fundamental rights
	CO5	Study the interrelationship between fundamental rights, fundamental duties and Directive principles of state policy and their role in achieving the constitutional goals
	CO6	Analyse the case law critically in the context of the ideal of a welfare state
LAW OF CRIMES - I (IPC) (GENERAL PRINCIPLES) 10BC0307	CO1	Shall develop a conceptual understanding of the basics principles of law of crime
	CO2	Shall be able to understand different elements and stages of crime.
	CO3	Shall be able to analyze about criminal liability and inchoate crime
	CO4	Shall also learn about the general defenses available to a criminal.
INTERNSHIP (LOWER COURT I) 4 WEEKS 10BC0308	CO1	Understand the basic requirement of depth knowledge of the subject matter in a case.
	CO2	Analyse the most basic legal cases.
	CO3	Create an alignment of curriculum with enormous practical exposure.
	CO1	The learner will be able to use basic greetings in the French language.

LANGUAGE (BASICS OF FRENCH LANGUAGE FRENCH - I) 10SL0301	CO2	The learner will be able to use genders, numbers and articles in the French language.
	CO3	The learner will have the basic vocabulary to have communication in the French language.
<b>Course Outcomes for the Second Year Fourth Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
ORGANIZATION BEHAVIOUR 10BC0401	CO1	The students will understand concept of organization behavior.
	CO2	Application of some important concept like values, attitude, personality, personality perception and learning
	CO3	Understand impact of motivation in organization behavior
	CO4	The students will come to know importance of group decision making in behavior.
	CO5	Enable students to see use of leadership, power and conflict in behavior.
PUBLIC INTERNATIONAL LAW 10BC0402	CO1	Understanding the importance and implication of International Law and Organizations
	CO2	Understand that in absence of Municipal Law how Public International Law helps the states to follow a Code of Conduct
	CO3	Appreciate the role of Public International Law
ENVIRONMENT LAW 10BC0403	CO1	Shall develop a conceptual understanding of the environmental concern, world over.
	CO2	Acquire a clear knowledge of various laws, nationally and internationally,
	CO3	Shall be able to evaluate, analyze and assess the laws and its practical application.
	CO4	Shall also endeavor to find out the changing positions of world with respect to tackling the threat posed by environmental degradation.
FAMILY LAW II 10BC0404	CO1	The students will be able to Shall understand the various concepts and institutions of Hindu joint family system.

	CO2	Student Shall understand the law and procedures of succession with its different forms i.e. Intestate and testamentary succession.
	CO3	Student Shall understand women's property rights under different Religious system and statutory provisions.
	CO4	Student Shall understand the provisions with respect to bequest under different religious practices.
CONSTITUTIONAL LAW II 10BC0405	CO1	To understand the role of President as an executive Head of Union and various powers and functions; especially the power to grant pardon and power to issue Ordinance
	CO2	To understand the formation of Council of ministers and its responsibility in the governance of the Country;
	CO3	To analyze the role of legislature and also the distribution of legislative powers between Union and State;
	CO4	To understand the Nature and of Indian Judicial System with its distinctive feature, Power and functions of higher judiciary and role of Precedent in governance of country;
LAW OF CRIMES - II (IPC) (GENERAL PRINCIPLES) 10BC0406	CO1	Shall develop a conceptual understanding of the specific principles of Criminal Law.
	CO2	Shall be able to understand different offences against Human Body such as Murder and Rape.
	CO3	Shall be able to understand different offences against Property such as theft, Extortion, robbery, dacoity etc.
	CO4	Shall develop an understanding of different offences against peace and tranquility of State.
INTERNSHIP (LOWER COURT 2) 4 WEEKS 10BC0407	CO1	Understand the basic requirement of depth knowledge of the subject matter in a case.
	CO2	Analyse the most basic legal cases.

	CO3	Create an alignment of curriculum with enormous practical exposure.
LANGUAGE (BASICS OF FRENCH LANGUAGE FRENCH - II) 10SL0401	CO1	The learner will be able to introduce himself/herself in the French Language.
	CO2	The learner will be able to understand the basic questions in the French language.
	CO3	The learner will be able to answer the basic questions in the French Language.
<b>Course Outcomes for the Third Year Fifth Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
PRINCIPLES OF MARKETING 10BC0501	CO1	To create awareness about evolution of marketing
	CO2	The student will be familiar with product and process of new product development
	CO3	This will impart different pricing strategies in marketing
	CO4	To create awareness about various promotional marketing program.
	CO5	To conceptualized different distribution channels in the context of marketing.
HUMAN RIGHTS & INTERNATIONAL HUMANITARIAN LAW 10BB0501	CO1	To understand the concept of jus in bello and jus ad bellum to analyse the principle of proportionality, precaution and distinction To be able to identify the meaning of IHL and IHRL To apply IHL and IHRL
	CO2	To be able to identify the meaning of customary international law in International Human rights law and International Humanitarian Law.
	CO3	To be able to explain the law regarding warfare and the modern developments in it.
	CO4	To be able to able to develop a critical thinking regarding the International humanitarian law and human rights law
CRIMINAL PROCEDURE CODE 10BB0502	CO1	Identify the stages in investigation and procedure of trial in criminal cases
	CO2	Explain the powers, functions, and duties of police and criminal courts.
	CO3	Understand the provisions relating to maintenance of Wife, Children and Parents.
CORPORATE LAW I	CO1	To recall basic concepts and Characteristics of company

10BB0503	CO2	To demonstrate Incorporation procedure and its Consequences
	CO3	To apply provisions relating to various prospectus and types of share issuance.
	CO4	To classify and compare various types of debentures
	CO5	To evaluate membership and modes of acquiring membership
	CO6	To formulate high standards relating to the directors and key managerial personals.
LAW OF EVIDENCE 10BB0504	CO1	Recognize evidence that is admissible before the court of law
	CO2	Understand the difference between admissible and inadmissible evidence
	CO3	Analyze the kinds of evidence and their admissibility under different sections of IEA
	CO4	Apply legal provisions to the problem in front of them with regards to admissibility of evidence
	CO5	Recognize evidence that is admissible before the court of law
ADMINISTRATIVE LAW 10BB0505	CO1	To understand the meaning and scope of administrative law
	CO2	To be able to apply the concept of Rule of Law and Separation of Powers
	CO3	To be able to analyse the scope and objective of delegated legislation and emerging trends in administrative law
LEGAL WRITING 10BB0506	CO1	Understand the meaning and scope of legal writing as a discipline
	CO2	To identify importance of language in legal writing
	CO3	to enable students to draft various legal documents.
	CO4	To help students analyse the differences between the academic and non academic writing.
	CO5	to demonstrate the importance of ethics in legal writing and research
INTERNSHIP (HIGH COURT 1) 4 WEEKS 10BB0507	CO1	Understand the nuances of social reality
	CO2	Identify the social issues facing by the people in society
	CO3	Create an ambience for amelioration of the issues related to society
<b>Course Outcomes for the Third Year Sixth Semester Course</b>		

<b>Course Title with Code</b>		<b>Statement</b>
ESSENTIALS OF E-COMMERCE 10BC0601	CO1	Define the basics of E-Business and E-Commerce.
	CO2	Demonstrate the requirement of infrastructure for E-Business.
	CO3	Relate different business strategies for E-Business.
	CO4	Critiques the need of supply chain management and E-Marketing.
	CO5	Formulate customer relationship management and change management in E-Commerce.
LABOUR & INDUSTRIAL LAW I 10FL0601	CO1	Understand the labour legislation and various other provisions thereby
	CO2	Apply the knowledge of various labour laws and become aware of the rights and responsibilities of the management and especially workmen and trade unions, compliance and penalties under provided under the labour laws
	CO3	Analyze the scope and objectives of labour laws and enable students to understand the reforms required in the law to cope up the recent developments taking place
	CO4	Assess and develop a higher thinking order relating to the labour administration and justice
INTERPRETATION OF STATUTES 10FL0602	CO1	On completion of this course, students will be able to To know and understand the concept of Interpretation and its difference with construction.
	CO2	To be able to demonstrate the different rules of interpretation
	CO3	To apply the relevancy of various principles of interpretation
	CO4	To be able to analyse the internal aids to construction and external aids to construction.
	CO5	To evaluate the roles of judiciary along with extent in ascertaining meaning of any statute and to develop a higher thinking order through identifying the new judicial trend.
	CO6	To be able to elaborate on the interpretation of constitution and its importance.
CORPORATE LAW II	CO1	To define the basic concepts & procedure of corporate administration.

10FL0603	CO2	To compare among inspection, inquiry and investigation of a company
	CO3	To evaluate Compromises, Arrangements and Amalgamations and their procedural aspect
	CO4	To identify Prevention of Oppression and Mismanagement through case laws
	CO5	To analyse Offences, Penalties and their compounding nature.
	CO6	To elaborate the procedure & reasons for winding up & To formulate the jurisdiction and application of National Company Law Tribunal and Appellate Tribunal on the dispute on corporate affairs of company.
CIVIL PROCEDURE CODE & LIMITATION ACT 10FL0604	CO1	State the detail procedure for redressal of civil rights.
	CO2	Identify the place of suing, procedure for institution of suit, the documents in support and against, evidence taking and trial, dimensions of an interim order, the peculiar nature of the suits, the complexities of executing a decree and provisions for appeal and revision.
	CO3	Analyze the procedural requirement to initiate trail of civil civil Describe Parties of suits, Institution and Trial of suit.
	CO4	Execute Plaintiff and written statement.
	CO5	Compare Suits, Appeals, Review and Reference.
	CO6	Relate the law of limitation to civil proceedings.
PROPERTY LAW 10FL0605	CO1	On completion of this course, students will be able to define the various kinds of properties.
	CO2	Describe the principles of transfer of property applicable to both movable and immovable properties.
	CO3	Identify the principles applicable to Transfer of Immovable Property
	CO4	Relate the provisions of Sale and Mortgage.
	CO5	Relate the provisions of Charge and lease.
	CO6	Interpret provisions of Gift, Actionable Claim and Indian Easement Act
	CO1	To exhibit memory on the basic concept of IP rights.

INTELLECTUAL PROPERTY LAW 10FL0606	CO2	To Compare product/process patents and relating rules.
	CO3	To identify trademarks & geographical indications and their application.
	CO4	To examine the provisions relating to the Copyright.
	CO5	To appraise importance of industrial designs by interpreting judicial decisions.
	CO6	To imagine the consequences of non-protection of trade secrets & key business concerns in commercializing intellectual property.
INTERNSHIP HIGH COURT 2) 4 WEEKS 10FL0607	CO1	To define the basic concepts & procedure of court proceeding.
	CO2	To evaluate various legal matters present in society and its regulations
	CO3	To compare various rules and regulations.
	CO4	To identify Alternative dispute settlement.
	CO5	To analyze court objectives, power, functions and penalties.
	CO6	To elaborate the court procedure, power, functions and penalties.
<b>Course Outcomes for the Fourth Year Seventh Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
LAW ON MERGER AND ACQUISITION 10BL0701	CO1	Define and classify various types of corporate restructuring.
	CO2	Identify the acquisition techniques of takeover.
	CO3	Examine and break information relating to the planning, strategy and taxation & Stamp duty relating to the corporate restructuring.
	CO4	Evaluate and determine process and documentation -Merger and Acquisition Transactions.
	CO5	Interpret the regulatory approvals of Scheme & Appearance before NCLT/ NCLAT
	CO6	Formulate and discuss the technique of Fast Track Mergers & Cross Border Mergers.
LAW ON INFRASTRUCTURE DEVELOPMENT	CO1	To understand the basics in infrastructure laws in order to undertake advanced courses in the field



10BL0702	CO2	To analyse the comparative assessment of the regulatory laws and policies of different infrastructure sectors
	CO3	To interpret the main aspects of the legal framework that governs the development of infrastructure projects through private participation
	CO4	To evaluate the core issues in general and specific infrastructure sectors
	CO5	To apply various laws, policies, judicial pronouncement, and reforms in the field of infrastructure.
CRIMINOLOGY 10CR0701	CO1	Explain the underlying philosophies, history, concepts of Criminology.
	CO2	Understand the theories of causation of crime.
	CO3	Demonstrate the various criminal typologies
	CO4	Analyze the concept of punishment.
	CO5	Analyze the concept Female Criminality and victimity
IT OFFENCES 10CR0702	CO1	To understand the basics in the legal framework on information technology and relevant offences
	CO2	To analyse the laws relevant to information technology offences
	CO3	To interpret the cyber security laws
	CO4	To evaluate legal recognition and authentication of electronic records in relation to information technology offences
	CO5	To apply various laws and policies to the liability of intermediaries, publishers of digital news and online curated content
LABOUR & INDUSTRIAL LAW II 10FL0701	CO1	Understand the labour legislations and various other provisions thereby.
	CO2	Apply the knowledge of various labour laws and become aware of the social security and labour welfare.
	CO3	Analyze the scope and objectives of labour laws and enable students to understand the reforms required in the law to cope up the recent developments taking place.

	CO4	Assess and develop a higher thinking order relating to the labour administration and justice.
DRAFTING, PLEADING AND CONVEYANCE (CLINICAL COURSE II) 10FL0702	CO1	After completing this course, Students will be able to Analyze and apply general principles of drafting and conveyancing.
	CO2	Use effective writing techniques to draft different types of legal documents.
	CO3	Draft different types of Deeds including deed of sale of land, mortgage deeds, license deeds, lease deeds, assignment deeds, trust deeds, partnership deeds and power of attorney deeds.
	CO4	Draft different types of contracts including commercial agreements, professional services agreement, employment agreements franchise, agency, dealership and distributorship agreements, intellectual property rights agreements, arbitration agreements, foreign collaboration and joint ventures agreements and real estate and tenancy agreements.
	CO5	Analyze and apply general principles of drafting and conveyancing.
	CO6	Use effective writing techniques to draft different types of legal documents.
TAXATION LAW I 10FL0703	CO1	To define the basic concepts & procedure of Taxation Laws I i.e. Direct Tax Law & Practices.
	CO2	To compare computation of income under the head of salary/ house property/ profits and gains from business and profession.
	CO3	To identify computation of income under the head of capital gains/ from other sources/ total income and tax liability.
	CO4	To analyse clubbing provisions, set-off and / or carry forward of losses, rebate and relief & TDS/TCS, returns, refund & recovery.
	CO5	To elaborate procedure, power, functions, penalties and to formulate the jurisdiction & application of income tax law & authorities.
	CO1	On completion of this course, students will be able To be remember and understand the different facets of Alternate Dispute Resolution

ALTERNATIVE DISPUTE RESOLUTION (CLINICAL COURSE III) 10FL0704	CO2	To be able to apply the principles of negotiation, conciliation and mediation in modern day situations
	CO3	To be able to analyze the nuances of arbitration law in India
	CO4	To evaluate the role of alternate dispute resolution in reducing the burden of courts along with extent to develop a higher thinking order through identifying the emerging trends in the concerned legal framework.
INVESTMENT & SECURITY LAW 10FL0705	CO1	To define the basic concepts & procedure of investment and securities laws.
	CO2	To evaluate various financial instruments present in money market and its regulations.
	CO3	To compare investment in Mutual funds, its rules and regulations with other investment options.
	CO4	To identify Alternative Investment Fund & Collective Investment Schemes with applicable laws.
	CO5	To analyse SEBI objectives, power, functions and penalties.
	CO6	To elaborate the SCRA procedure, power, functions and penalties on Stock Exchanges in India. 7. To formulate the jurisdiction & application of SEBI, SAT and various Courts relating to the Investor protection in securities market.
INTERNSHIP (SUPREME COURT/LAW FIRM/CORPORATE HOUSE 1/COURT I) 4 WEEKS	CO1	Understand the nuances of social reality
	CO2	Identify the social issues facing by the people in society
	CO3	Create an ambience for amelioration of the issues related to society
<b>Course Outcomes for the Fourth Year Eight Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
LAW ON CORPORATE FINANCE 10BL0801	CO1	Know basic on Equity Public/ Private Funding.
	CO2	Illustrate Indian Equity- Non-Fund Based regulation.
	CO3	Solve the problems of Debt Funding – Indian Fund Based (Corporate Debt).

	CO4	Examine by identifying causes related Debt Funding – Indian Non-Fund Based.
	CO5	Establish opinion through judgments on regulation on Foreign Funding – Instruments & Institutions.
	CO6	Elaborate Company Listing on Indian/International Stock Exchanges procedures and laws & solutions in related problems.
LAW OF CORPORATE GOVERNANCE 10BL0802	CO1	To understand the concept of corporate governance and will also be able to appreciate the principles, theories and models of corporate governance.
	CO2	To explain the legislative framework of corporate governance in India.
	CO3	To describe about the role of Auditors in corporate governance.
	CO4	To interpret the role of SEBI in corporate governance.
PENOLOGY AND VICTIMOLOGY 10CR0801	CO1	Understand contemporary issues and challenges of punishment system.
	CO2	Explain the typologies and theories of victimization.
	CO3	Apply the procedure for the proper treatment to victims.
	CO4	Analyse the sentencing policies of India.
	CO5	Evaluate efficacy of capital punishment in Indian context.
ADMINISTRATION OF CRIMINAL JUSTICE I 10CR0802	CO1	Describe jurisprudential aspects of Criminal Justice Administration.
	CO2	Analyze the manner in which society responds to crime.
	CO3	Evaluate the merits of various theories of crime.
	CO4	Understand the interconnection of Crime and Society in India
	CO5	Apply and elaborate about the facets of Human Rights and Criminal Justice System in India.
BANKING & INSURANCE LAW 10FL0801	CO1	Define and demonstrate understanding of facts & ideas relating to banking and insurance laws.
	CO2	Identify new situation by applying techniques & rules in a different way in Banking System.

	CO3	Examine and Compare evidence to support generalizations in Negotiable Instruments, SARFAESI Act and Foreign Exchange Management.
	CO4	Appraise the opinions by making judgments based on a set of criteria related to concept of insurance.
	CO5	To develop new pattern of resolutions to overcome from problem related to health/ general/agriculture/ motor insurances.
PRIVATE INTERNATIONAL LAW 10FL0802	CO1	Understand and remember the principles of conflict of laws and its application in cases involving foreign element
	CO2	Apply the concept of domicile in matrimonial disputes
	CO3	Analyze the principles of conflict of laws in relation to the Indian legal mechanism and its practices
	CO4	Evaluate the issue of jurisdiction and application of foreign laws in a case where foreign element is involved
COMPETITION LAW 10FL0803	CO1	Define basic economics related to the competition, monopoly, Market power etc.
	CO2	Interpret Competition Act 2002.
	CO3	Solve the problems of Anti-competitive agreements and related issues.
	CO4	Examine by identifying causes related to prohibition on abuse of dominant position.
	CO5	Present and defend opinions through judgments on regulation of combinations.
	CO6	Formulate CCI role and Competition law jurisprudence compilation in developing a new pattern/ proposing alternative solutions.
TAXATION LAW II (INDIRECT TAX LAW & PRACTICES) 10FL0804	CO1	To understand the concept of indirect taxes, indirect tax system in India, difference between direct and indirect tax and Double Tax Avoidance Treaty.
	CO2	To interpret the various principles underlying the Indirect Taxation Statutes with reference to Goods and Services Tax Act, 2017

	CO3	To describe the provisions of IGST Act, 2017, UTGST Act, 2017 and its working and Provisions of GST (Compensation to State) Act, 2017.
	CO4	To acquire the ability to analyse and interpret the various provisions of Custom Laws.
PUBLIC INTEREST LAWYERING, LEGAL AID & PARA LEGAL SERVICES (CLINICAL COURSE IV) 10FL0805	CO1	To know and understand the structure and working of the legal services institutions under the Legal Services Authorities Act, 1987.
	CO2	To analyze and evaluate the significance of Public Interest Litigation(s) and its effects on the society
	CO3	To coordinate with the legal services institutions and other Authorities for the best interest of beneficiaries and stakeholders.
	CO4	To create and understand how to draft various documents essential to a public interest practice
INTERNSHIP (SUPREME COURT/LAW FIRM/CORPORATE HOUSE 2) 4 WEEKS 10FL0806	CO1	Identify, accurately formulate, and apply the rules or principles of law pertinent to the situation
	CO2	Draw and explain relevant factual analogies and distinctions
	CO3	Critically examine the rules, principles, and reasoning upon which legal arguments are based
	CO4	Develop, elaborate, and evaluate legal theories relevant to the situation

## Course Outcomes (COs) for Batch 2019-24

<b>Course Outcomes for the First Year First Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
PRINCIPLES OF BUSINESS ADMINISTRATION 10BC0101	CO1	Introduction to Management
	CO2	Planning in Management
	CO3	Awareness about Organizing and various structures
	CO4	Importance of Directing in Management
	CO5	Importance of controlling and its various methods
BUSINESS ENVIRONMENT 10BC0102	CO1	Introduction to Business Economics
	CO2	Awareness about Economic and Political Environment
	CO3	Introduction to Legal Framework
	CO4	Awareness about Legal Technological Environment
	CO5	Introduction to Social Environment
PRINCIPLES OF ACCOUNTING 10BC0103	CO1	Implement the accounting process from journal entries to trial balance
	CO2	Understand the need for uniformity in accounting
	CO3	Prepare financial statements of sole-proprietary business
LEGAL METHODS 10BC0105	CO1	Understand the concept, sources and the functions of law and various legal systems of the world.
	CO2	Understand the hierarchy of the Indian courts and their jurisdictions
	CO3	Understand judicial reasoning and its application in the Courts
	CO4	Acquire the ability to identify legal issues and principles underlying in any given factual situation and to undertake and present research on such issues
	CO5	Equip with the basics of legal research methodology and legal writing
LAW OF CONTRACT – I (GENERAL PRINCIPLES) 10BC0106	CO1	Develop a conceptual understanding of the basics of law of contract.
	CO2	Understand the legal aspects of a valid contract and at the same time judge a void and voidable contract.

	CO3	Learn the remedies available in cases of breach of contract
	CO4	Have conceptual understanding of E-contracts, and government Contracts.
	CO5	Develop strong analytical skills
CRITICAL THINKING & ARGUMENTATIVE SKILLS 10CR0101	CO1	Identify the differences between fact and opinion.
	CO2	Identify, compose and refute propositions of fact, value and policy.
	CO3	To understand the methods of analyzing evidences in order to organize, deliver and critique effective arguments and rebuttals.
	CO4	Analyze and utilize formal and informal logic to construct arguments which advocate or defend position(s).
	CO5	Utilize ethical communication when developing arguments while simultaneously taking into consideration diverse audiences.
ENGLISH – I (LINGUISTICS AND LITERATURE) 10SL0101	CO1	The students will get the necessary training in language skills and they will be able to develop and enhance their listening skills for various purposes
	CO2	The students will get the necessary training in language skills and they will be able to understand and use written and spoken language in context.
	CO3	The students will get the necessary training in language skills and they will be able to comprehend, compare and differentiate between various written texts/documents
	CO4	The students will get the necessary training in language skills and they will be able to evolve appropriate writing competence.
<b>Course Outcomes for the First Year Second Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
BUSINESS COMMUNICATION 10BC0201	CO1	Inculcate formal reading and writing skills required to communicate with colleagues in the workplace.
	CO2	Writing effective business letters, reports.
BUSINESS ECONOMICS 10BC0202	CO1	The students will have basic understanding of microeconomics
	CO2	Understand the concept of consumer behaviour



	CO3	To enable the students to understand demand and supply relationship
	CO4	The students will have basic understanding of production and cost analysis
	CO5	To simplify the equilibrium of firm and industry
ADVANCED ACCOUNTING PRINCIPLE 10BC0203	CO1	Address advanced accounting issues of partnership firm
	CO2	Understand the difference between hire purchase and installment purchase transactions
	CO3	Classify the branches and do the accounting accordingly and demonstrate knowledge of the concept of Ex-interest and Cum-interest
LAW OF TORTS, CONSUMER PROTECTION ACT, 1986 & MOTOR VEHICLE ACT, 1988 10BC0204	CO1	Understand the concept of torts, its essentials and kinds with defences.
	CO2	Differentiate between the tortious liability, criminal liability and contractual liability.
	CO3	Safeguard the rights and interest of consumers which they can enforce under the provisions of The Consumer Protection Act, 1986.
	CO4	Understand the justice dispensation system under The Consumer Protection Act, 1986.
	CO5	Learn the basic forms of no fault liabilities and insurance policies which will enable students to help an aggrieved get the appropriate remedy provided under the existing laws.
LAW OF CONTRACT – II 10BC0205	CO1	To recall concepts of contract to special contracts
	CO2	To demonstrate understanding on various principles relating to Contract of Indemnity & Guarantee.
	CO3	To experiment with principles and provisions on Bailment & Pledge.
	CO4	To examine the principle of agency in practice
	CO5	To evaluate the difference between Partnership & Limited Liability Partnership Act and benefits.
	CO6	To formulate the modern contract technique and develop new drafting skills in the Sale of Goods Act 1930 with Amendments.

MOOT COURT TRAINING 10BC0206	CO1	Identify the legal issues arising from a hypothetical set of facts
	CO2	Research the law relevant to these legal issues
	CO3	Formulate legal argument based on this research
	CO4	Apply the law accurately and persuasively
	CO5	Distinguish any case law which runs contrary to the argument being made
	CO6	Present this argument articulately and clearly in an oral format
INTERNSHIP (NGO) 10BC0207	CO1	Understand the nuances of social reality
	CO2	Identify the social issues facing by the people in society
	CO3	Create an ambiance for amelioration of the issues related to society
LAW THROUGH POPULAR MEDIA 10SL0151	CO1	Understand and analyze the different courtroom situations in a critical manner
	CO2	Use legal language with reference to a particular context
	CO3	Create an argument critically in the field of Law
<b>Course Outcomes for the Second Year Third Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
FINANCIAL ACCOUNTING 10BC0301	CO1	Able to understand basic of various techniques inventory management
	CO2	Clear understanding of various cost
	CO3	Understanding of importance of preparing subsidiary books
	CO4	Understand purpose of preparing bank reconciliation statements
	CO5	Conceptual understanding of final accounts and financial statement analysis
FUNDAMENTALS OF ENTREPRENEURSHIP 10BC0302	CO1	Awareness about various concepts of entrepreneurship
	CO2	Awareness about preparing a good business plan.
	CO3	Enhanced knowledge of students of various sources of finance in for entrepreneurship
	CO4	Visualization of the criteria of Large Scale, Small Scale and Cottage Industries.
	CO5	Learning through real life examples of entrepreneurship
	CO1	Awareness about basics of Human Resource Management

HUMAN RESOURCE MANAGEMENT 10BC0303	CO2	Exploration techniques of procurement of human resource
	CO3	Visualization various training techniques used for human resource
	CO4	Enhancement of knowledge of through various concepts of compensation and maintenance
	CO5	Insights of industrial relations
JURISPRUDENCE 10BC0304	CO1	Interpret and assess competing philosophical and ethical perspectives on law, and to use those perspectives to formulate arguments about law, politics and ethics.
	CO2	Identify and analyze critically key jurisprudential issues.
	CO3	Engage in and cultivate reasoned legal and moral arguments, by way of both oral and written presentation.
	CO4	Produce (by a specified deadline) a concise and appropriately structured report addressing a key jurisprudential issue.
	CO5	Carry out literature reviews, formulate theses and summarize legal and ethical perspectives.
	CO6	Think logically, to assess competing principles impartially and to identify and solve legal and ethical problems
FAMILY LAW I 10BC0305	CO1	Have conceptual clarity about marriage, divorce, parental custody, domestic abuse and children's rights.
	CO2	Understand the establishment, composition and powers of family Courts.
	CO3	Understand and address the various issues and problems of adoption and maintenance.
	CO4	Understand the provisions of guardianship and minority
	CO5	Have clarity about Muslim Laws covering both codified and unmodified part.
CONSTITUTIONAL LAW I 10BC0306	CO1	Understand the meaning nature and salient features of the Constitution of India.

	CO2	Understand the jurisprudence of the fundamental freedoms guaranteed to the citizens of India
	CO3	Learn the Fundamental rights and duties guaranteed by the constitution
	CO4	Acquire a basic knowledge of the constitutional remedies in case of violation of fundamental rights
	CO5	Study the interrelationship between fundamental rights, fundamental duties and Directive principles of state policy and their role in achieving the constitutional goals
	CO6	Analyse the case law critically in the context of the ideal of a welfare state
	LAW OF CRIMES - I (IPC) (GENERAL PRINCIPLES) 10BC0307	CO1
CO2		Shall be able to understand different elements and stages of crime.
CO3		Shall be able to analyze about criminal liability and inchoate crime
CO4		Shall also learn about the general defenses available to a criminal.
INTERNSHIP (LOWER COURT I) 4 WEEKS 10BC0308	CO1	Understand the basic requirement of depth knowledge of the subject matter in a case.
	CO2	Analyse the most basic legal cases.
	CO3	Create an alignment of curriculum with enormous practical exposure.
LANGUAGE (BASICS OF FRENCH LANGUAGE FRENCH - I) 10SL0301	CO1	The learner will be able to use basic greetings in the French language.
	CO2	The learner will be able to use genders, numbers and articles in the French language.
	CO3	The learner will have the basic vocabulary to have communication in the French language.
<b>Course Outcomes for the Second Year Fourth Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
ORGANIZATION BEHAVIOUR 10BC0409	CO1	Define the concept organization behaviour.
	CO2	Demonstrate the core elements of organization behaviour.

	CO3	Relate various important theories of motivation in organization behaviour.
	CO4	Critiques group decision making and communication.
	CO5	Construct the role of leadership in organization behaviour.
PUBLIC INTERNATIONAL LAW 10FL0401	CO1	To know and understand the role of Public International Law in the modern day society
	CO2	To know and understand the role of Public International Law in the modern-day society
	CO3	To evaluate the importance of Public International Law in following a code of conduct by the states.
ENVIRONMENT LAW 10FL0402	CO1	Shall develop a conceptual understanding of the environmental concern, world over.
	CO2	Acquire a clear knowledge of various laws, nationally and internationally,
	CO3	Shall be able to evaluate, analyze and assess the laws and its practical application.
	CO4	Shall also endeavor to find out the changing positions of world with respect to tackling the threat posed by environmental degradation.
	CO5	To exhibit memory on Environment, Nature and Ecosystem concepts.
	CO6	To demonstrate understanding of International Environmental Conventions.
FAMILY LAW II 10FL0403	CO1	Describe various concepts and institutions under family law, i.e., JHF, HUF, wakf and religious Endowment.
	CO2	State the law and procedures of intestate succession.
	CO3	Compare right to property of women under different Religious and Statutory Law.
	CO4	Relate testamentary succession under various religious and statutory Law.
	CO5	Interpret the right of pre-emption under various personal laws.
	CO6	Develop Wakf and other Religious Endowment.

CONSTITUTIONAL LAW II 10FL0404	CO1	To be able to define the role of the Indian Legislature both the Union and the State
	CO2	To compare and contrast the different organs of the Government.
	CO3	To identify the role, power and function of President, Council of ministers and its responsibility
	CO4	To analyse the role of legislature and also the distribution of legislative powers between Union and State; Indian Judicial System, various types of emergency and effects
	CO5	To evaluate the legislative, administrative functions of the Government.
	CO6	Develop the higher thinking order in relation to the basic structure theory as restriction on amending power of the parliament.
LAW OF CRIMES - II (IPC) (SPECIFIC OFFENCES) 10FL0405	CO1	Understand the specific offences under IPC
	CO2	Know the essential ingredients of specific offences
	CO3	Analyse different offences against Human Body such as Murder and Rape, against Property such as theft, Extortion, robbery, dacoity etc.
	CO4	Assess and develop a higher thinking order relating to the criminal legal system administration and justice
INTERNSHIP (LOWER COURT 2) 4 WEEKS 10FL0406	CO1	Understand the basic requirement of depth knowledge of the subject matter in a case.
	CO2	Analyse the most basic legal cases.
	CO3	Create an alignment of curriculum with enormous practical exposure.
LANGUAGE (BASICS OF FRENCH LANGUAGE FRENCH - II) 10SL0402	CO1	The students will get basic exposure to the French language and they will be able to read basic instructions in French.
	CO2	The students will get basic exposure to the French language and they will be able to ask basic questions in French.
	CO3	The students will get basic exposure to the French language and they will be able to answer basic questions in French.

**Course Outcomes for the Third Year Fifth Semester Course**

<b>Course Title with Code</b>		<b>Statement</b>
<b>PRINCIPLES OF MARKETING</b> 10BC0502	CO1	Define different marketing concepts.
	CO2	Demonstrate the process of new product mix, product line and product development.
	CO3	Relate various theories of pricing methods.
	CO4	Critiques the marketing techniques for promotion.
	CO5	Construct the basics of distribution channels.
<b>HUMAN RIGHTS &amp; INTERNATIONAL HUMANITARIAN LAW</b> 10FL0501	CO1	To be able to define the concept of jus in bello and jus ad bellum
	CO2	To be able to demonstrate the principle of proportionality, precaution and distinction
	CO3	To be able to identify the meaning of customary international law in International Human rights law and International Humanitarian Law.
	CO4	To compare the International Humanitarian Law and Human Rights Law
	CO5	To be able to explain the law regarding warfare and the modern developments in it.
	CO6	To be able to able to develop a critical thinking regarding the International humanitarian law and human rights law
<b>CRIMINAL PROCEDURE CODE</b> 10FL0502	CO1	Identify the stages in investigation and procedure of trial in criminal cases
	CO2	Explain the powers, functions, and duties of police and criminal courts.
	CO3	Understand the provisions relating to maintenance of Wife, Children and Parents.
<b>CORPORATE LAW I</b> 10FL0503	CO1	To recall basic concepts and Characteristics of company
	CO2	To demonstrate Incorporation procedure and its Consequences
	CO3	To apply provisions relating to various prospectus and types of share issuance.
	CO4	To classify and compare various types of debentures
	CO5	To evaluate membership and modes of acquiring membership

	CO6	To formulate high standards relating to the directors and key managerial personals.
LAW OF EVIDENCE 10FL0504	CO1	Understand evidence that is admissible before the court of law
	CO2	Know the difference between admissible and inadmissible evidence
	CO3	Apply legal provisions to the problem in front of them with regards to admissibility of evidence
	CO4	Analyze the kinds of evidence and their admissibility under different sections of Indian Evidence Act
	CO5	Assess and develop a higher thinking order in legal proceedings
ADMINISTRATIVE LAW 10FL0505	CO1	Define the meaning and scope of administrative law and delegated legislation
	CO2	State the principles of natural justice.
	CO3	Explain administrative adjudication.
	CO4	Discuss administrative discretion and remedies.
	CO5	Interpret the liability of administration.
	CO6	Compare administrative process and judicial review.
LEGAL WRITING (ENRICHMENT COURSE) 10FL0506	CO1	To understand the meaning and scope of legal writing and Legal English
	CO2	To be able to identify the different paradigms of legal writing
	CO3	To be able to demonstrate, scope and forms of research
	CO4	To be able to analyse the ethical standards in legal writing
INTERNSHIP (HIGH COURT 1) 4 WEEKS 10FL0507	CO1	Identify and articulate legal issues in the context
	CO2	Chose and implement an effective strategy, selecting and employing authoritative resources to locate relevant legal authority
	CO3	To compare various rules and regulations.
	CO4	To identify Alternative dispute settlement.
	CO5	To analyze court objectives, power, functions and penalties.
	CO6	To analyze court objectives, power, functions of Judicial System
<b>Course Outcomes for the Third Year Sixth Semester Course</b>		



<b>Course Title with Code</b>		<b>Statement</b>
<b>ESSENTIALS OF E-COMMERCE</b> 10BC0601	CO1	Define the basics of E-Business and E-Commerce.
	CO2	Demonstrate the requirement of infrastructure for E-Business.
	CO3	Relate different business strategies for E-Business.
	CO4	Critiques the need of supply chain management and E-Marketing.
	CO5	Formulate customer relationship management and change management in E-Commerce.
<b>LABOUR &amp; INDUSTRIAL LAW I</b> 10FL0601	CO1	Understand the labour legislation and various other provisions thereby
	CO2	Apply the knowledge of various labour laws and become aware of the rights and responsibilities of the management and especially workmen and trade unions, compliance and penalties under provided under the labour laws
	CO3	Analyze the scope and objectives of labour laws and enable students to understand the reforms required in the law to cope up the recent developments taking place
	CO4	Assess and develop a higher thinking order relating to the labour administration and justice
<b>INTERPRETATION OF STATUTES</b> 10FL0602	CO1	On completion of this course, students will be able to To know and understand the concept of Interpretation and its difference with construction.
	CO2	To be able to demonstrate the different rules of interpretation
	CO3	To apply the relevancy of various principles of interpretation
	CO4	To be able to analyse the internal aids to construction and external aids to construction.
	CO5	To evaluate the roles of judiciary along with extent in ascertaining meaning of any statute and to develop a higher thinking order through identifying the new judicial trend.
	CO6	To be able to elaborate on the interpretation of constitution and its importance.
<b>CORPORATE LAW II</b>	CO1	To define the basic concepts & procedure of corporate administration.

10FL0603	CO2	To compare among inspection, inquiry and investigation of a company
	CO3	To evaluate Compromises, Arrangements and Amalgamations and their procedural aspect
	CO4	To identify Prevention of Oppression and Mismanagement through case laws
	CO5	To analyse Offences, Penalties and their compounding nature.
	CO6	To elaborate the procedure & reasons for winding up & To formulate the jurisdiction and application of National Company Law Tribunal and Appellate Tribunal on the dispute on corporate affairs of company.
CIVIL PROCEDURE CODE & LIMITATION ACT 10FL0604	CO1	State the detail procedure for redressal of civil rights.
	CO2	Identify the place of suing, procedure for institution of suit, the documents in support and against, evidence taking and trial, dimensions of an interim order, the peculiar nature of the suits, the complexities of executing a decree and provisions for appeal and revision.
	CO3	Analyze the procedural requirement to initiate trail of civil civil Describe Parties of suits, Institution and Trial of suit.
	CO4	Execute Plaintiff and written statement.
	CO5	Compare Suits, Appeals, Review and Reference.
	CO6	Relate the law of limitation to civil proceedings.
PROPERTY LAW 10FL0605	CO1	On completion of this course, students will be able to define the various kinds of properties.
	CO2	Describe the principles of transfer of property applicable to both movable and immovable properties.
	CO3	Identify the principles applicable to Transfer of Immovable Property
	CO4	Relate the provisions of Sale and Mortgage.
	CO5	Relate the provisions of Charge and lease.
	CO6	Interpret provisions of Gift, Actionable Claim and Indian Easement Act
	CO1	To exhibit memory on the basic concept of IP rights.

INTELLECTUAL PROPERTY LAW 10FL0606	CO2	To Compare product/process patents and relating rules.
	CO3	To identify trademarks & geographical indications and their application.
	CO4	To examine the provisions relating to the Copyright.
	CO5	To appraise importance of industrial designs by interpreting judicial decisions.
	CO6	To imagine the consequences of non-protection of trade secrets & key business concerns in commercializing intellectual property.
INTERNSHIP HIGH COURT 2) 4 WEEKS 10FL0607	CO1	To define the basic concepts & procedure of court proceeding.
	CO2	To evaluate various legal matters present in society and its regulations
	CO3	To compare various rules and regulations.
	CO4	To identify Alternative dispute settlement.
	CO5	To analyze court objectives, power, functions and penalties.
	CO6	To elaborate the court procedure, power, functions and penalties.

## Course Outcomes (COs) for Batch 2020-25

<b>Course Outcomes for the First Year First Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
PRINCIPLES OF BUSINESS ADMINISTRATION 10BC0101	CO1	Introduction to Management
	CO2	Planning in Management
	CO3	Awareness about Organizing and various structures
	CO4	Importance of Directing in Management
	CO5	Importance of controlling and its various methods
BUSINESS ENVIRONMENT 10BC0102	CO1	Introduction to Business Economics
	CO2	Awareness about Economic and Political Environment
	CO3	Introduction to Legal Framework
	CO4	Awareness about Legal Technological Environment
	CO5	Introduction to Social Environment
PRINCIPLES OF ACCOUNTING 10BC0103	CO1	Implement the accounting process from journal entries to trial balance
	CO2	Understand the need for uniformity in accounting
	CO3	Prepare financial statements of sole-proprietary business
LEGAL METHODS 10BC0105	CO1	Understand the concept, sources and the functions of law and various legal systems of the world.
	CO2	Understand the hierarchy of the Indian courts and their jurisdictions
	CO3	Understand judicial reasoning and its application in the Courts
	CO4	Acquire the ability to identify legal issues and principles underlying in any given factual situation and to undertake and present research on such issues
	CO5	Equip with the basics of legal research methodology and legal writing
LAW OF CONTRACT – I (GENERAL PRINCIPLES) 10BC0106	CO1	Develop a conceptual understanding of the basics of law of contract.
	CO2	Understand the legal aspects of a valid contract and at the same time judge a void and voidable contract.

	CO3	Learn the remedies available in cases of breach of contract
	CO4	Have conceptual understanding of E-contracts, and government Contracts.
	CO5	Develop strong analytical skills
CRITICAL THINKING & ARGUMENTATIVE SKILLS 10CR0101	CO1	Identify the differences between fact and opinion.
	CO2	Identify, compose and refute propositions of fact, value and policy.
	CO3	To understand the methods of analyzing evidences in order to organize, deliver and critique effective arguments and rebuttals.
	CO4	Analyze and utilize formal and informal logic to construct arguments which advocate or defend position(s).
	CO5	Utilize ethical communication when developing arguments while simultaneously taking into consideration diverse audiences.
ENGLISH – I (LINGUISTICS AND LITERATURE) 10SL0101	CO1	The students will get the necessary training in language skills and they will be able to develop and enhance their listening skills for various purposes
	CO2	The students will get the necessary training in language skills and they will be able to understand and use written and spoken language in context.
	CO3	The students will get the necessary training in language skills and they will be able to comprehend, compare and differentiate between various written texts/documents
	CO4	The students will get the necessary training in language skills and they will be able to evolve appropriate writing competence.
<b>Course Outcomes for the First Year Second Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
BUSINESS ECONOMICS 10BC0208	CO1	Define the concept of microeconomics.
	CO2	Demonstrate different tendency of consumer behavior.
	CO3	Relate the relationship between demand and supply.
	CO4	Critique the cost and production relationships.
	CO5	Construct fundamentals of various equilibrium firm and industry.

BUSINESS COMMUNICATION 10BC0209	CO1	Inculcate formal reading and writing skills required to communicate with colleagues in the workplace.
	CO2	Writing effective business letters, reports.
FINANCIAL MANAGEMENT 10BC0210	CO1	Define concept of financial management.
	CO2	Demonstrate different basics of Indian financial system.
	CO3	Relate the fundamentals of working capital.
	CO4	Critique the decisions in capital expenditure.
	CO5	Construct basics of regulation related to financial management.
LAW OF TORTS, CONSUMER PROTECTION ACT, 1986 & MOTOR VEHICLE ACT, 1988 10FL0201	CO1	On completion of this course, students will be able to state the meaning and nature of the Law of Torts.
	CO2	On completion of this course, students will be able to describe the liability for the Wrong Committed by Other Person
	CO3	On completion of this course, students will be able to describe Negligence, Contributory Negligence and Nuisance.
	CO4	On completion of this course, students will be able to interpret General Defenses for the Tortuous Liability.
	CO5	On completion of this course, students will be able to relate Torts Against Human Being and Property.
	CO6	On completion of this course, students will be able to criticize the liabilities based on fault & Remedies.
	CO7	Describe The Consumer Protection Act, 2019
	CO8	Describe Motor Vehicle Act, 1988.
LAW OF CONTRACT – II 10FL0202	CO1	To recall concepts of contract to special contracts
	CO2	To demonstrate understanding on various principles relating to Contract of Indemnity & Guarantee.
	CO3	To experiment with principles and provisions on Bailment & Pledge.
	CO4	To examine the principle of agency in practice

	CO5	To evaluate the difference between Partnership & Limited Liability Partnership Act and benefits.
	CO6	To formulate the modern contract technique and develop new drafting skills in the Sale of Goods Act 1930 with Amendments.
MOOT COURT TRAINING 10FL0203	CO1	Present this argument articulately and clearly in an oral format
	CO2	Research the law relevant to these legal issues;
	CO3	Identify the legal issues arising from a hypothetical set of facts
	CO4	Formulate legal argument based on this research
	CO5	Apply the law accurately and persuasively
	CO6	Distinguish any case law which runs contrary to the argument being made
INTERNSHIP (NGO) 10FL0204	CO1	Understand the nuances of social reality
	CO2	Identify the social issues facing by the people in society
	CO3	Create an ambiance for amelioration of the issues related to society
LAW THROUGH POPULAR MEDIA 10SL0152	CO1	Understand and analyze the different courtroom situations in a critical manner
	CO2	Use legal language with reference to a particular context
	CO3	Create an argument critically in the field of Law
<b>Course Outcomes for the Second Year Third Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
FINANCIAL ACCOUNTING 10BC0309	CO1	State the concept of subsidiary book
	CO2	Demonstrate different classifications of various costs.
	CO3	Examine various capital budgeting techniques.
	CO4	Critiques the interpretation of financial statement.
	CO5	Develop final accounts of company.
FUNDAMENTALS OF ENTREPRENEURSHIP 10BC0310	CO1	Identify the fundamental concepts of entrepreneurship.
	CO2	Interpret business environment.
	CO3	Relate various business plans concerned with the new business.
	CO4	Critiques the different sources of finance in entrepreneurship

	CO5	Formulate the stories of success and failure of a business.
HUMAN RESOURCE MANAGEMENT 10BC0311	CO1	Define the concept human resource management.
	CO2	Demonstrate the procurement tools for human resource management
	CO3	Relate various important theories of training and development.
	CO4	Appraise the basics of compensation and maintenance.
	CO5	Construct the fundamentals of industrial relations.
JURISPRUDENCE 10FL0301	CO1	To be able to relate to the different aspects of jurisprudence as a field of study.
	CO2	Interpret and assess competing philosophical and ethical perspectives on law, and to use those perspectives to formulate arguments about law, politics and ethics.
	CO3	Identify the critically key jurisprudential issues.
	CO4	Analyse and reason the legal and moral arguments, by way of both oral and written presentation.
	CO5	Evaluate a concise and appropriately structured report addressing a key jurisprudential issue.
	CO6	Develop and formulate theses and summarize legal and ethical perspectives.
FAMILY LAW I 10FL0302	CO1	State origin, types, classification of families and personal laws.
	CO2	Identify the various modes of marriages under different personal laws.
	CO3	Describe the establishment, composition and powers of family Courts.
	CO4	Interpret the provisions of guardianship and minority.
	CO5	Criticize various issues and problems of adoption and maintenance.
	CO6	Develop the various legal provisions as well as judgments of Supreme Court and High Courts.
CONSTITUTIONAL LAW I 10FL0303	CO1	On completion of this course, students will be able define the meaning nature and salient features of the Constitution of India
	CO2	To be able to demonstrate the jurisprudence of the fundamental freedoms guaranteed to the citizens of India



	CO3	To be able to develop and solve problems relating to the Fundamental rights and duties guaranteed by the constitution
	CO4	To be able to analyze the basic knowledge of the constitutional remedies in case of violation of fundamental rights
	CO5	To be able to explain the interrelationship between fundamental rights, fundamental duties and Directive principles of state policy and their role in achieving the constitutional goals
	CO6	To be able to elaborate on the case law critically in the context of the ideal of a welfare state
LAW OF CRIMES - I (IPC) (GENERAL PRINCIPLES) 10FL0304	CO1	Understanding of the basic principles of law of crime
	CO2	Know different elements and stages of crime
	CO3	Apply legal provisions to the problem in front of them with regards to offenses
	CO4	Analyze about criminal liability and inchoate crime
	CO5	Assess and develop a higher thinking order relating to the administration criminal justice
INTERNSHIP (LOWER COURT I) 4 WEEKS 10FL0306	CO1	Understand the basic requirement of depth knowledge of the subject matter in a case.
	CO2	Analyse the most basic legal cases.
	CO3	Create an alignment of curriculum with enormous practical exposure.
LANGUAGE (BASICS OF FRENCH LANGUAGE FRENCH - I) 10SL0302	CO1	The students will get basic exposure to the French language and they will be able to use basic greetings.
	CO2	The students will get basic exposure to the French language and they will be able to introduce themselves in French language.
	CO3	The students will get basic exposure to the French language and they will be able to understand basic conversations in French language.
<b>Course Outcomes for the Second Year Fourth Semester Course</b>		

<b>Course Title with Code</b>		<b>Statement</b>
ORGANIZATION BEHAVIOUR 10BC0409	CO1	Define the concept organization behaviour.
	CO2	Demonstrate the core elements of organization behaviour.
	CO3	Relate various important theories of motivation in organization behaviour.
	CO4	Critiques group decision making and communication.
	CO5	Construct the role of leadership in organization behaviour.
PUBLIC INTERNATIONAL LAW 10FL0401	CO1	To know and understand the role of Public International Law in the modern day society
	CO2	To know and understand the role of Public International Law in the modern-day society
	CO3	To evaluate the importance of Public International Law in following a code of conduct by the states.
ENVIRONMENT LAW 10FL0402	CO1	Shall develop a conceptual understanding of the environmental concern, world over.
	CO2	Acquire a clear knowledge of various laws, nationally and internationally,
	CO3	Shall be able to evaluate, analyze and assess the laws and its practical application.
	CO4	Shall also endeavor to find out the changing positions of world with respect to tackling the threat posed by environmental degradation.
	CO5	To exhibit memory on Environment, Nature and Ecosystem concepts.
	CO6	To demonstrate understanding of International Environmental Conventions.
FAMILY LAW II 10FL0403	CO1	Describe various concepts and institutions under family law, i.e., JHF, HUF, wakf and religious Endowment.
	CO2	State the law and procedures of intestate succession.
	CO3	Compare right to property of women under different Religious and Statutory Law.
	CO4	Relate testamentary succession under various religious and statutory Law.

	CO5	Interpret the right of pre-emption under various personal laws.
	CO6	Devlop Wakf and other Religious Endowment.
CONSTITUTIONAL LAW II 10FL0404	CO1	To be able to define the role of the Indian Legislature both the Union and the State
	CO2	To compare and contrast the different organs of the Government.
	CO3	To identify the role, power and function of President, Council of ministers and its responsibility
	CO4	To analyse the role of legislature and also the distribution of legislative powers between Union and State; Indian Judicial System, various types of emergency and effects
	CO5	To evaluate the legislative, administrative functions of the Government.
	CO6	Devlop the higher thinking order in relation to the basic structure theory as restriction on amending power of the parliament.
LAW OF CRIMES - II (IPC) (SPECIFIC OFFENCES) 10FL0405	CO1	Understand the specific offences under IPC
	CO2	Know the essential ingredients of specific offences
	CO3	Analyse different offences against Human Body such as Murder and Rape, against Property such as theft, Extortion, robbery, dacoity etc.
	CO4	Assess and develop a higher thinking order relating to the criminal legal system administration and justice
INTERNSHIP (LOWER COURT 2) 4 WEEKS 10FL0406	CO1	Understand the basic requirement of depth knowledge of the subject matter in a case.
	CO2	Analyse the most basic legal cases.
	CO3	Create an alignment of curriculum with enormous practical exposure.
LANGUAGE (BASICS OF FRENCH LANGUAGE FRENCH - II) 10SL0402	CO1	The students will get basic exposure to the French language and they will be able to read basic instructions in French.
	CO2	The students will get basic exposure to the French language and they will be able to ask basic questions in French.

	CO3	The students will get basic exposure to the French language and they will be able to answer basic questions in French.
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## Course Outcomes (COs) for Batch 2021-26

<b>Course Outcomes for the First Year First Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
PRINCIPLES OF BUSINESS ADMINISTRATION 10BC0101	CO1	Introduction to Management
	CO2	Planning in Management
	CO3	Awareness about Organizing and various structures
	CO4	Importance of Directing in Management
	CO5	Importance of controlling and its various methods
BUSINESS ENVIRONMENT 10BC0102	CO1	Introduction to Business Economics
	CO2	Awareness about Economic and Political Environment
	CO3	Introduction to Legal Framework
	CO4	Awareness about Legal Technological Environment
	CO5	Introduction to Social Environment
PRINCIPLES OF ACCOUNTING 10BC0103	CO1	Implement the accounting process from journal entries to trial balance
	CO2	Understand the need for uniformity in accounting
	CO3	Prepare financial statements of sole-proprietary business
LEGAL METHODS 10FL0101	CO1	Understand the concept, sources and the functions of law and various legal systems of the world.
	CO2	Understand the hierarchy of the Indian courts and their jurisdictions
	CO3	Understand judicial reasoning and its application in the Courts
	CO4	Acquire the ability to identify legal issues and principles underlying in any given factual situation and to undertake and present research on such issues
	CO5	Equip with the basics of legal research methodology and legal writing
LAW OF CONTRACT – I (GENERAL PRINCIPLES) 10BC0106	CO1	Develop a conceptual understanding of the basics of law of contract.
	CO2	Understand the legal aspects of a valid contract and at the same time judge a void and voidable contract.

	CO3	Learn the remedies available in cases of breach of contract
	CO4	Have conceptual understanding of E-contracts, and government Contracts.
	CO5	Develop strong analytical skills
CRITICAL THINKING & ARGUMENTATIVE SKILLS 10CR0101	CO1	Identify the differences between fact and opinion.
	CO2	Identify, compose and refute propositions of fact, value and policy.
	CO3	To understand the methods of analyzing evidences in order to organize, deliver and critique effective arguments and rebuttals.
	CO4	Analyze and utilize formal and informal logic to construct arguments which advocate or defend position(s).
	CO5	Utilize ethical communication when developing arguments while simultaneously taking into consideration diverse audiences.
ENGLISH – I (LINGUISTICS AND LITERATURE) 10SL0101	CO1	The students will get the necessary training in language skills and they will be able to develop and enhance their listening skills for various purposes
	CO2	The students will get the necessary training in language skills and they will be able to understand and use written and spoken language in context.
	CO3	The students will get the necessary training in language skills and they will be able to comprehend, compare and differentiate between various written texts/documents
	CO4	The students will get the necessary training in language skills and they will be able to evolve appropriate writing competence.
<b>Course Outcomes for the First Year Second Semester Course</b>		
<b>Course Title with Code</b>		<b>Statement</b>
BUSINESS ECONOMICS 10BC0208	CO1	Define the concept of microeconomics.
	CO2	Demonstrate different tendency of consumer behavior.
	CO3	Relate the relationship between demand and supply.
	CO4	Critique the cost and production relationships.
	CO5	Construct fundamentals of various equilibrium firm and industry.

BUSINESS COMMUNICATION 10BC0209	CO1	Inculcate formal reading and writing skills required to communicate with colleagues in the workplace.
	CO2	Writing effective business letters, reports.
FINANCIAL MANAGEMENT 10BC0210	CO1	Define concept of financial management.
	CO2	Demonstrate different basics of Indian financial system.
	CO3	Relate the fundamentals of working capital.
	CO4	Critique the decisions in capital expenditure.
	CO5	Construct basics of regulation related to financial management.
LAW OF TORTS, CONSUMER PROTECTION ACT, 1986 & MOTOR VEHICLE ACT, 1988 10FL0201	CO1	On completion of this course, students will be able to state the meaning and nature of the Law of Torts.
	CO2	On completion of this course, students will be able to describe the liability for the Wrong Committed by Other Person
	CO3	On completion of this course, students will be able to describe Negligence, Contributory Negligence and Nuisance.
	CO4	On completion of this course, students will be able to interpret General Defenses for the Tortuous Liability.
	CO5	On completion of this course, students will be able to relate Torts Against Human Being and Property.
	CO6	On completion of this course, students will be able to criticize the liabilities based on fault & Remedies.
	CO7	Describe The Consumer Protection Act, 2019
	CO8	Describe Motor Vehicle Act, 1988.
LAW OF CONTRACT – II 10FL0202	CO1	To recall concepts of contract to special contracts
	CO2	To demonstrate understanding on various principles relating to Contract of Indemnity & Guarantee.
	CO3	To experiment with principles and provisions on Bailment & Pledge.
	CO4	To examine the principle of agency in practice

	CO5	To evaluate the difference between Partnership & Limited Liability Partnership Act and benefits.
	CO6	To formulate the modern contract technique and develop new drafting skills in the Sale of Goods Act 1930 with Amendments.
MOOT COURT TRAINING 10FL0203	CO1	Present this argument articulately and clearly in an oral format
	CO2	Research the law relevant to these legal issues;
	CO3	Identify the legal issues arising from a hypothetical set of facts
	CO4	Formulate legal argument based on this research
	CO5	Apply the law accurately and persuasively
	CO6	Distinguish any case law which runs contrary to the argument being made
INTERNSHIP (NGO) 10FL0204	CO1	Understand the nuances of social reality
	CO2	Identify the social issues facing by the people in society
	CO3	Create an ambiance for amelioration of the issues related to society
LAW THROUGH POPULAR MEDIA 10SL0152	CO1	Understand and analyze the different courtroom situations in a critical manner
	CO2	Use legal language with reference to a particular context
	CO3	Create an argument critically in the field of Law



# **COURSE OUTCOME**

**FACULTY OF PHYSIOTHERAPY**

**STEP 8****Semester1**

<b>Course Title</b>	<b>ANATOMY</b>
<b>Course Code</b>	<b>17PT0101</b>
<b>Course Outcomes:</b>	
CO1 : Course Acquire the knowledge of structure of human body in general.	
CO2 : Understand the regional anatomy in detail.	
CO3 : Anatomical changes right from embryonic period till old age	
CO4 : Understand histological features of various organs.	
CO5 : Understand its application in medical science.	
CO6 : To apply the concept of functional Anatomy in physiotherapy practice.	

<b>Course Title</b>	<b>PHYSIOLOGY</b>
<b>Course Code</b>	<b>17PT0102</b>
<b>Course Outcomes:</b>	
CO1 : Understand the contribution of various organs & systems in maintaining homeostasis and body functions.####	
CO2 : To involve a detailed study of the physiology of the various systems of the body including functional physiology of	
CO3 : Understand the role of hormones, enzymes, and other different types of cells in the human body.	
CO4 : Understand how these separate systems interact to yield integrated physiological responses to challenges such as	
CO5 : To relate the concept of human physiology in physiotherapy application including exercise physiology.	

<b>Course Title</b>	<b>BIOCHEMISTRY</b>
<b>Course Code</b>	<b>17PT0103</b>
<b>Course Outcomes:</b>	
CO1 : Describe the structure and function of the cell in brief.	
CO2 : Describe the normal functions of different components of food.	
CO3 : Describe basal metabolic rate and factors affecting basal metabolic rate with special reference to obesity.	
CO4 : Describe nutritional aspects of carbohydrates, lipids, proteins, vitamins, and minerals and their metabolism with	
CO5 : Understand the basics and clinical aspects of enzymes and regulation of enzymatic activity and diagnostic use of	
CO6 : Describe in detail the biochemical aspects of muscle contraction.	

<b>Course Title</b>	<b>PSYCHOLOGY</b>
<b>Course Code</b>	<b>17PT0104</b>
<b>Course Outcomes:</b>	
CO1 : Define the term psychology and its importance in the health delivery system and gain knowledge of psychological	
CO2 : Understand behavioral patterns of individuals, theories of development, normal and abnormal aspects of motor,	
CO3 : Understand the importance of the psychological status of the person in the health and diseases, environmental and	
CO4 : Acquire the knowledge as to how to deal with the patient.	

<b>Course Title</b>	<b>SOCIOLOGY</b>
<b>Course Code</b>	<b>17PT0105</b>
<b>Course Outcomes:</b>	
CO1 : Define the term sociology and its importance in the health delivery system.	
CO2 : Understand the basic sociological concepts, principles and social process, social institution in relation to the	
CO3 : Understanding the various social factors affecting health and diseases.	

**CO4 :** Understand the effects of disease on a patient's behaviour affected by social factors and how to deal with a patient.

**Course Title** ENVIRONMENTAL STUDIES

**Course Code** 17PT0106

**Course Outcomes:**

**CO1 :** Be aware of the environment around us and develop an understanding of sustainable development Acquire a basic

**Course Title** BIOMEDICAL PHYSICS

**Course Code** 17PT1107

**Course Outcomes:**

**CO1 :** Understand the physics principles & Laws of Electricity, Electromagnetic Spectrum & ultrasound.

**CO2 :** Describe effects of environmental & man-made electromagnetic fields at the cellular level & risk factors on

**CO3 :** Describe the main electrical supply, electric shock –precautions.

**CO4 :** Enumerate types & production of various therapeutic electrical currents. Describe the panel diagrams of the

**CO5 :** Describe in brief, certain common electrical components such as transistors, valves, capacitors, transformers, etc. &

**CO6 :** Describe & identify various types of electrodes used in therapeutics, describe electrical skin resistance & the

**Course Title** EXERCISE THERAPY-I & AMP; SOFT TISSUE MANIPULATION

**Course Code** 17PT1112

**Course Outcomes:**

**CO1 :** Understand the basic mechanical principles and effect of exercises in the restorations of physical function.

**CO2 :** Describe and acquire the skills of application and demonstration of the use of various tools of the therapeutic

**CO3 :** Describe and acquire the skills of application and demonstration of the use of various tools of the therapeutic

**CO4 :** Describe the physiological and therapeutic effect of various movements and demonstrate them in various anatomical

**CO5 :** Acquire the skills of application of various massage manipulations and describe the physiological effect, therapeutic

**CO6 :** Acquires the skills of application of various exercise therapeutic modalities in the restoration of physical function

## Semester2

**Course Title** PATHOLOGY

**Course Code** 17PT0201

**Course Outcomes:**

**CO1 :** Acquire the knowledge of concepts of cell injury and changes produced thereby in different tissues and organs;

**CO2 :** Recall the etio-pathogenesis, the pathological effects and the clinico-pathological correlation of common infection

**CO3 :** Acquire the knowledge of concepts of neoplasia with reference to the etiology, gross and microscopic features,

**CO4 :** Correlate normal and altered morphology of different organ systems in different diseases needed for understanding

**CO5 :** Acquire knowledge of common immunological disorders and their resultant effects on the human body

**CO6 :** Understand in brief, about the hematological diseases and investigations necessary to diagnose them and determine

**Course Title** MICROBIOLOGY

**Course Code** 17PT0202

**Course Outcomes:**

**CO2 :** At the end of the course, the student will be able to have sound knowledge of the agents responsible for causing

**Course Title** PHARMACOLOGY

*Asst. Prof.*

<b>Course Code</b>	<b>17PT0203</b>
<b>Course Outcomes:</b>	
CO1 : Understand the concepts of general pharmacology	
CO2 : Understand the pharmacological actions of different categories of drugs	
CO3 : Explain the mechanism of drug action at the organ system/subcellular/ macromolecular levels	
CO4 : Apply the basic pharmacological knowledge in the prevention and treatment of various diseases	
CO5 : Understand the adverse effects, contraindication of drugs	

<b>Course Title</b>	<b>KINESIOLOGY</b>
<b>Course Code</b>	<b>17PT0204</b>
<b>Course Outcomes:</b>	
CO1 : Analyze normal human movement from a global perspective, integrating biomechanics, force, muscle mechanics and	
CO2 : Experience quantitative methods of movement analysis using various methods.	
CO3 : Apply the analytic methods to specific examples of normal human motor performance.	
CO4 : Use these methods for evaluation and treatment of disorders of the Musculoskeletal system.	
CO5 : Apply the analytic methods of different muscles and its effects on specific joints in the human body.	
CO6 : Acquire the knowledge about locomotion and its kinetic -kinematic analysis.	

<b>Course Title</b>	<b>PSYCHIATRY</b>
<b>Course Code</b>	<b>17PT0207</b>
<b>Course Outcomes:</b>	
CO1 : Enumerate various psychiatric disorders with special emphasis to movement, pain and ADL & describe the various	
CO2 : Acquire the knowledge in brief about the pathological and etiological factors, common signs and symptoms and	
CO3 : Describe in brief the various treatment modalities commonly used.	

<b>Course Title</b>	<b>ELECTROTHERAPY</b>
<b>Course Code</b>	<b>17PT1205</b>
<b>Course Outcomes:</b>	
CO1 : 1. Know the principles, production, physiological effects, therapeutic uses, merits/ demerits, technique and effects of	
CO2 : List the indications and contraindications of various types of electrotherapy, demonstrate different techniques and	
CO3 : Apply different electrotherapeutic modality to patients.	

<b>Course Title</b>	<b>EXERCISE THERAPY 2</b>
<b>Course Code</b>	<b>17PT1206</b>
<b>Course Outcomes:</b>	
CO1 : Students will be able to Describe the biophysical properties of connective tissue and the effect of biomedical loading	
CO2 : Students will acquire the skill of assessment of isolated & group muscle strength, & Range of motion of the joints	
CO3 : Students will be able to analyze normal human posture and its associated problems, its management.	
CO4 : Students will be able to describe and demonstrate various therapeutic exercise with its technique: including chest P.	
CO5 : Students will be able to demonstrate general fitness, exercise and shall gain fitness for oneself	

### Semester3

<b>Course Title</b>	<b>BASIC PROGRAMMING WITH C</b>
<b>Course Code</b>	<b>01OE0001</b>



**Course Outcomes:**

CO1 : Able to explain programming problems logically through flow charts and algorithms.

CO2 : Identify programming principles using C Language.

CO3 : Demonstrate problem solving skills through C Language.

<b>Course Title</b>	<b>RENEWABLE ENERGY &amp; ENERGY CONSERVATION</b>
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<b>Course Code</b>	<b>01OE0003</b>
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**Course Outcomes:**

CO1 : Differentiate between various types of energy sources.

CO2 : Identify challenges and strength of various energy convention technologies

CO3 : Analyse solar and wind energy technologies from system perspective.

CO4 : Understand the various route to generate energy from biomass and other renewable resources

CO5 : Articulate various challenges associated with use of renewable energy sources.

<b>Course Title</b>	<b>DISASTER MANAGEMENT</b>
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<b>Course Code</b>	<b>01OE0007</b>
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**Course Outcomes:**

CO1 : Build knowledge about the need and importance of disaster management in the concerned field

CO2 : Understand the causes of Natural and Manmade disasters

CO3 : Discuss the mitigation measures for Natural and Manmade disasters

CO4 : Understand the importance of science and technology in disaster risk management

CO5 : Apply the concept of Disasters management for realization of the responsibilities to society

<b>Course Title</b>	<b>FUNDAMENTAL SKILLS IN SENSOR INTERFACING</b>
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<b>Course Code</b>	<b>01OE0008</b>
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**Course Outcomes:**

CO1 : Understand application-based programming concept

CO2 : To create programs for various open-source programmable boards

CO3 : To develop programs for specific requirements with interfacing of various components and modules

CO4 : To develop hardware and software interfacing for engineering applications

<b>Course Title</b>	<b>BASICS OF LAW</b>
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<b>Course Code</b>	<b>10OE0001</b>
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**Course Outcomes:**

CO1 : Students will be able to distinguish between the different types of laws.

CO2 : To understand the intricacies of Civil and Criminal Law.

CO3 : To discuss the importance of the fundamental concepts underlying Indian law.

CO4 : To comprehend the importance of Information and Consumer Laws in the Country and will be able to know the

<b>Course Title</b>	<b>BASICS CONCEPT OF FITNESS AND HEALTH PROMOTION</b>
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<b>Course Code</b>	<b>17OE0001</b>
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**Course Outcomes:**

CO0 : students should be able to perform basic fitness assessment & should understand basic cardiovascular,

<b>Course Title</b>	<b>MEDICINE (GENERAL MEDICINE &amp; SKIN)</b>
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<b>Course Code</b>	<b>17PT0301</b>
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**Course Outcomes:**

CO1 : Acquire the knowledge of Etiology, Pathophysiology, signs and symptoms and management in brief, of the

CO2 : Acquire the knowledge in medicine that is required to be practised in the community and at all levels of the health

CO3 : Understand relevant investigations which will help to know about the important medical conditions.

CO4 : Able to describe the principles of management at the medical intensive care unit including the practice of first

<b>Course Title</b>	<b>NEUROLOGY &amp; PEDIATRICS</b>
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<b>Course Code</b>	<b>17PT0302</b>
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**Course Outcomes:**

CO1 : Understand the basic neurological conditions which commonly cause disability and their management.

CO2 : Know the etiology, Classification, Pathology, Clinical Features, Relevant Investigations, Complications, Surgical &

CO3 : Understand the importance of various investigations like haematological, biochemical, electrophysiological & radio

CO4 : Describe the normal development and growth of a child

CO5 : Describe neuromuscular, Musculoskeletal and cardiopulmonary conditions in children and also acquire the skill of

<b>Course Title</b>	<b>SURGERY</b>
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<b>Course Code</b>	<b>17PT0303</b>
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**Course Outcomes:**

CO1 : Able to describe preoperative evaluation, surgical indications and various surgical approaches in various abdominal,

CO2 : To remember surgical approaches in the form of line diagram and will be able to describe the components of soft

CO3 : Describe the management of head injury, spinal surgeries, intracranial tumors, peripheral nerve injury, pain, wound,

CO4 : Describe the normal and abnormal physiological events during puberty, labour, postnatal stage and menopause.

CO5 : Discuss the various complications during pregnancy and management.

CO6 : Acquire the skill of examination of pelvic floor muscles and also a pregnant woman.

<b>Course Title</b>	<b>PHYSICAL &amp; FUNCTIONAL DIAGNOSIS</b>
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<b>Course Code</b>	<b>17PT0304</b>
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**Course Outcomes:**

CO1 : Acquire the skill of detection & objective documentation of the Neuro-Musculoskeletal dysfunction such as Pain,

CO2 : Analyse & discuss the Physiological & Biomechanical bases of movement dysfunction

CO3 : Acquire the skill of performance and interpretation of electrodiagnostic tests and Pulmonary Function Test

CO4 : Analyse Arterial Blood Gas analysis and Exercise Tolerance Test

<b>Course Title</b>	<b>ORTHOPEDICS (TRAUMATIC &amp; NON-TRAUMATIC)</b>
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<b>Course Code</b>	<b>17PT0305</b>
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**Course Outcomes:**

CO1 : Understand the pathophysiology, clinical manifestations and conservative/surgical management of various traumatic,

CO2 : Able to gain the skill of clinical examination and interpretation of the preoperative cold cases and all the post-

CO3 : Able to read and interpret pathological/biochemical studies and radio imaging of orthopaedic conditions and able to

CO4 : Understand the pathophysiology, clinical manifestations and conservative/surgical management of various traumatic,

<b>Course Title</b>	<b>PREVENTIVE HEALTHCARE AND COMMUNITY MEDICINE</b>
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<b>Course Code</b>	<b>17PT0306</b>
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**Course Outcomes:**

CO1 : Able to describe the concept of health and diseases, the natural history of diseases.

CO2 : Able to describe the health care delivery system and able to describe the health problems of vulnerable groups and

**CO3** : Able to identify occupational health hazards and their management and describe the role of various health agencies,  
**CO4** : Acquire the knowledge in preventive and curative measures that are required to be practised in the community and at

<b>Course Title</b>	<b>PROFESSIONAL PRACTICE &amp; ETHICS + EVIDENCE BASED PRACTICE &amp; ICF</b>
<b>Course Code</b>	<b>17PT0307</b>
<b>Course Outcomes:</b>	
<b>CO1</b> : At the end of the course, students should be able to critically appraise the evidence, do an economic evaluation of	
<b>CO1</b> : At the end of the course, students should be able to critically appraise the evidence, do an economic evaluation of	

<b>Course Title</b>	<b>CLINICAL HOURS</b>
<b>Course Code</b>	<b>17PT0308</b>
<b>Course Outcomes:</b>	
<b>CO1</b> : Diagnose, treat and advice the patients with various conditions.	

### Semester4

<b>Course Title</b>	<b>PHYSIOTHERAPY IN MUSCULOSKELETAL CONDITIONS</b>
<b>Course Code</b>	<b>17PT0401</b>
<b>Course Outcomes:</b>	
<b>CO1</b> : Identify, discuss and analyze the musculoskeletal dysfunction in terms of biomechanical, kinesiological and	
<b>CO2</b> : Describe as well as acquire the skill of executing short and long term physiotherapy treatment by selecting	
<b>CO3</b> : Understand the nature of sports injuries, able to evaluate and treat sports injuries, understand the role of	
<b>CO4</b> : Prescribe appropriate walking aids, orthoses and prosthesis	

<b>Course Title</b>	<b>PHYSIOTHERAPY IN NEUROLOGICAL CONDITIONS</b>
<b>Course Code</b>	<b>17PT0402</b>
<b>Course Outcomes:</b>	
<b>CO1</b> : Acquire the knowledge of normal neurodevelopment with specific reference to locomotion	
<b>CO2</b> : Assess, identify and analyze neuro motor and psychosomatic dysfunction in terms of alteration in the muscle tone,	
<b>CO3</b> : Correlate the assessment findings with provisional diagnosis and investigations such as EMG/NCS and arrive at	
<b>CO4</b> : Plan, prescribe and execute short term and long term treatment with special reference to relief of neuropathic and	
<b>CO5</b> : Prescribe appropriate outhouses/splints and fabricate temporary protective and functional splints.	

<b>Course Title</b>	<b>PHYSIOTHERAPY IN CARDIO PULMONARY AND MEDICAL SURGICAL CONDITIONS</b>
<b>Course Code</b>	<b>17PT0403</b>
<b>Course Outcomes:</b>	
<b>CO1</b> : Identify, discuss and analyze cardio vascular and pulmonary dysfunction based on pathophysiological principles and	
<b>CO2</b> : Select strategies for cure, care and prevention to adopt restorative and rehabilitative measures for maximum possible	
<b>CO3</b> : Execute the effective physiotherapeutic measures (with appropriate clinical reasoning) with special emphasis to	
<b>CO4</b> : Acquire knowledge of the overview of patients care at the intensive care area, artificial ventilation, suctioning,	
<b>CO5</b> : Acquire the skill of evaluation and interpretation of functional capacity using simple exercise tolerance tests,	
<b>CO6</b> : Acquire the skill of basic cardiopulmonary resuscitation	

<b>Course Title</b>	<b>PHYSIOTHERAPY IN COMMUNITY HEALTH AND BIO- ENGINEERING</b>
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<b>Course Code</b>	<b>17PT0404</b>
<b>Course Outcomes:</b>	
CO1 : 1. describe the general concepts about Health, Disease & Physical fitness	
CO2 : 2. describe CBR in urban & rural set up, WHO policies, concept of team work, role of multi- purpose health worker.	
CO3 : 3. describe the strategies to assess prevalence & incidence of various conditions responsible for increasing morbidity	
CO4 : 4. Acquire knowledge about biomechanical principles of application of variety of aids & appliances used for	
CO5 : 5.	

<b>Course Title</b>	<b>BIOSTATISTICS AND RESEARCH METHODOLOGY</b>
<b>Course Code</b>	<b>17PT0405</b>
<b>Course Outcomes:</b>	
CO1 : Recognize different variables as per their types and should be able to decide on how to treat them differently as per	
CO2 : Differentiate complete enumeration and various forms of sampling (random: Simple, stratified, cluster, multi stage;	
CO3 : Decide when to apply what test or a measure of central tendency according to the need of the data and	
CO4 : Interpret a given output of regression or ANOVA according to the context.	

<b>Course Title</b>	<b>PROFESSIONAL PRACTICE AND ETHICS AND ADMINISTRATIVE MANAGEMENT</b>
<b>Course Code</b>	<b>17PT0406</b>
<b>Course Outcomes:</b>	
CO1 : Understand the moral values and meaning of ethics.	
CO2 : Acquire bedside manners and communication skills in relation with patients, peers seniors and other professionals.	
CO3 : Develop psychomotor skills for physiotherapist patient relationship.	
CO4 : Develop skill to evaluate and make decision for plan of management based on socio-cultural values and referral	
CO5 : Develop behavioral skills and humanitarian approach while communicating with patients, relatives, society at large	
CO6 : Understand the importance of council, its functioning and Act.	



# **COURSE OUTCOME**

**FACULTY OF MANAGEMENT STUDIES**

**STEP 8****Design Course Outcomes based on Revised Bloom's Taxonomy****Semester1**

<b>Course Title</b>	<b>MICRO ECONOMICS</b>
<b>Course Code</b>	<b>04BC0104</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Apply the basic concepts of demand and supply to explain the price and quantity equilibrium of a market.	
<b>CO2 :</b> Compare and contrast production and cost, short run and long run, and profits and revenues	
<b>CO3 :</b> To Comprehend the concepts of demand and supply analysis in business applications	
<b>CO4 :</b> To apply the understanding that economics is about the allocation of scarce resources and how that results in trade-offs.	
<b>CO5 :</b> To understand the production and cost analysis under different stages of production. Use economic problem solving skills to discuss the opportunities and challenges of the increasing economy growth of the country.	
<b>CO6 :</b> To comprehend the pricing and output decisions under various market structure. To understand and apply the various decision tools to understand the market structure	

<b>Course Title</b>	<b>BUSINESS ORGANIZATION &amp; MANAGEMENT</b>
<b>Course Code</b>	<b>04BC0105</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the concepts of business organizations, management, leadership, motivation and HRM	
<b>CO2 :</b> Identify business problems and develop suitable plans and strategies for the organization development	
<b>CO3 :</b> Develop and evaluate alternative courses of action and select a course suitable to the organizational problems	
<b>CO4 :</b> Explain various leadership styles and their suitability in the organizations	
<b>CO5 :</b> Apply various control techniques to enhance the attainment of organizational goals	

<b>Course Title</b>	<b>BUSINESS ENVIRONMENT</b>
<b>Course Code</b>	<b>04BC0106</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Comprehend the relationship of environment and business	
<b>CO2 :</b> Analyze the impact of government policies on business.	
<b>CO3 :</b> Explain the competitive structure of an industry	
<b>CO4 :</b> Exploring the external Business and Technology influences that affect the business in its environment, including economic, legal, social and technological factors	
<b>CO5 :</b> Evaluate the effects of social and demographic trends on business outcomes and the economy	



<b>Course Title</b>	<b>CURRENCY, BANKING AND EXCHANGE</b>
<b>Course Code</b>	<b>04BC0121</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Learn the important concepts in money, banking and exchange and their significance in day to day life.	
<b>CO2 :</b> Ability to apply concepts in decision making and solve problems	
<b>CO3 :</b> To familiarize the students with basic methods of credit creation and their applications in the field	
<b>CO4 :</b> To acquaint the students with the latest concepts	

<b>Course Title</b>	<b>HUMAN RESOURCE MANAGEMENT</b>
<b>Course Code</b>	<b>04BC0122</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Explain the importance of human resources and their effective management in organizations.	
<b>CO2 :</b> Analyze the key issues related to administering the human elements such as recruitment, training, compensation, management development and employment relations.	
<b>CO3 :</b> Understand fundamentals and importance of Training and Development.	
<b>CO4 :</b> Analysis various components of Compensation	
<b>CO5 :</b> Understand the process of job analysis and appreciate its importance as a foundation for human resource management practice.	

<b>Course Title</b>	<b>FINANCIAL ACCOUNTING-I</b>
<b>Course Code</b>	<b>04BC1101</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Describe, explain, and integrate fundamental concepts underlying accounting of partnership firm.	
<b>CO2 :</b> Prepare relevant accounts on dissolution of partnership firm and apply Garner vs. Murray rule	
<b>CO3 :</b> Prepare accounts of hire purchase and installment purchase transactions.	
<b>CO4 :</b> Apply knowledge to classify the branches and do the accounting accordingly	
<b>CO5 :</b> Evaluate and compare different investments	
<b>CO6 :</b> Demonstrate knowledge of the concept of Ex-interest and Cum-interest	

<b>Course Title</b>	<b>READING &amp; WRITING FOR BUSINESS</b>
<b>Course Code</b>	<b>04SL0102</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> to read and interpret formal business writings such as reports, articles and reviews;	
<b>CO2 :</b> to know structures of formal business letters and reports;	
<b>CO3 :</b> to write formal business letters and reports;	
<b>CO4 :</b> to inculcate a taste for reading and writing habits pertaining to the world of business.	



<b>Course Title</b>	<b>SPEAKING &amp; PRESENTATION SKILLS</b>
<b>Course Code</b>	<b>04SL0103</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Develop speaking skill in the context of Business	
<b>CO2 :</b> Enhance presentation skills in the context of business	
<b>CO3 :</b> Express ideas in an organized way for different communication situations	
<b>CO4 :</b> Demonstrate adequate command over language in a spoken form	

## Semester2

<b>Course Title</b>	<b>MACROECONOMICS</b>
<b>Course Code</b>	<b>04BC0202</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Comprehend why household, business, government and global behavior determine the aggregate demand for goods and services.	
<b>CO2 :</b> Understand the basics of national income accounting.	
<b>CO3 :</b> Apply economic reasoning to understand the operation of an economy.	

<b>Course Title</b>	<b>COMPUTER ESSENTIALS &amp; APPLICATIONS OF SPREADSHEET</b>
<b>Course Code</b>	<b>04BC0203</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand Fundamental Structure of a Computer System	
<b>CO2 :</b> Understand & Use Word Processor Utilities for Business using MS Word	
<b>CO3 :</b> Understand & Use Spreadsheet Utilities for Business using MS Excel	
<b>CO4 :</b> Understand & Design Presentations using MS PowerPoint	
<b>CO5 :</b> Use Google Workspace Utilities	

<b>Course Title</b>	<b>ENVIRONMENTAL STUDIES</b>
<b>Course Code</b>	<b>04BC0206</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand and realize the multidisciplinary nature of Environment & its components.	
<b>CO2 :</b> Know the importance of natural resources for the sustainable development of life.	
<b>CO3 :</b> Understand the effect of growing population on the Environment.	
<b>CO4 :</b> Classify the different types of pollution and measure to control pollution	
<b>CO5 :</b> Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.	



<b>Course Title</b>	<b>INDIAN FINANCIAL SYSTEM</b>
<b>Course Code</b>	<b>04BC0221</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Get acquainted with the basic framework of financial components of Indian Financial System	
<b>CO2 :</b> Identify and categorize the different types of financial institutions.	
<b>CO3 :</b> Understand the importance of financial market and its mechanism.	
<b>CO4 :</b> To get in depth understanding and awareness of different financial instruments	
<b>CO5 :</b> Equipped with the knowledge of financial services available in India.	

<b>Course Title</b>	<b>BUSINESS MATHEMATICS</b>
<b>Course Code</b>	<b>04BC0222</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand dimensions of Business Mathematics.	
<b>CO2 :</b> Formulate different functions and apply them in business problems.	
<b>CO3 :</b> Integrate and Apply knowledge on Permutation and Combination.	
<b>CO4 :</b> Formulate different applications of sequence and series and apply them in business problems.	
<b>CO5 :</b> Designing the framework of Matrix and Determinants and its usefulness for solving business problems.	

<b>Course Title</b>	<b>INDIAN ECONOMY</b>
<b>Course Code</b>	<b>04BC0223</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To know about the basic concepts basic characteristics of Indian economy	
<b>CO2 :</b> To Understand the importance, causes and impact of population growth and its distribution, and relate them with economic development and Its potential on natural resources	
<b>CO3 :</b> To understanding the basic issues of Agriculture sector in Indian Economy.	
<b>CO4 :</b> To know the Industrial policy and service sector role in economic growth of India	
<b>CO5 :</b> To Understand the role of strategy for poverty alleviation in India	
<b>CO6 :</b> Relationship between population growth and economic development	

<b>Course Title</b>	<b>FINANCIAL ACCOUNTING-II</b>
<b>Course Code</b>	<b>04BC1201</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Account for the transactions related to equity shares, preference shares and debentures of a company	
<b>CO2 :</b> Understand and apply the concepts to prepare Financial Statements and analyze the same.	
<b>CO3 :</b> Apply the criteria for bifurcating pre and post incorporation profits	
<b>CO4 :</b> Understand Application and implementation of various concepts relating to Accounting for bonus issue and right issue; Redemption of Share and debentures	
<b>CO5 :</b> Prepare the accounting for redemption of preference shares.	





**CO6 :** Analyze the accounting for redemption of debentures

<b>Course Title</b>	<b>BUSINESS STATISTICS</b>
<b>Course Code</b>	<b>04BC1205</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Acquire a fair degree of proficiency in comprehending statistical data, processing and analyzing it.	
<b>CO2 :</b> Apply various measures of central tendency and measures of dispersion in data analysis	
<b>CO3 :</b> Analyze the relationship between two variables using concepts of correlation and regression and its use in prediction	
<b>CO4 :</b> Develop an understanding of the index numbers and their utility in daily life and stock market	
<b>CO5 :</b> Analyze and apply the concept of probability and distributions in managerial decision making	

<b>Course Title</b>	<b>ENGLISH FOR WORKPLACE</b>
<b>Course Code</b>	<b>04SL0152</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Develop reading skills in the context of Business	
<b>CO2 :</b> Apply writing skills for purposes related to Business	
<b>CO3 :</b> Interpret written text and formulate appropriate written response	
<b>CO4 :</b> Express their ideas in formal, academic written form in the context of Business	

<b>Course Title</b>	<b>ENGLISH THROUGH MOVIES</b>
<b>Course Code</b>	<b>04SL0153</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> The students will be able to develop Fluency and Accuracy in a contextual manner.	
<b>CO2 :</b> The students will be able to comprehend specific language usage in audio - visual context.	
<b>CO3 :</b> The students will be able to express Ideas in a comprehensive manner on a given topic.	
<b>CO4 :</b> The students will be able to learn to use film elements to enhance their language proficiency.	

### Semester3

<b>Course Title</b>	<b>BASIC PROGRAMMING WITH C</b>
<b>Course Code</b>	<b>01OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Able to explain programming problems logically through flow charts and algorithms.	
<b>CO2 :</b> Identify programming principles using C Language.	



**CO3** : Demonstrate problem solving skills through C Language.

<b>Course Title</b>	<b>PYTHON FOR BEGINNERS</b>
<b>Course Code</b>	<b>01OE0002</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Familiar with the applications of Python and write python programs. and Describe the Python programming language.	
<b>CO2</b> : Use variables to store, retrieve and calculate the information of real-world problems and Utilise core programming tools such as functions and loops for problem-solving	

<b>Course Title</b>	<b>RENEWABLE ENERGY &amp; ENERGY CONSERVATION</b>
<b>Course Code</b>	<b>01OE0003</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Differentiate between various types of energy sources.	
<b>CO2</b> : Identify challenges and strength of various energy convention technologies	
<b>CO3</b> : Analyse solar and wind energy technologies from system perspective.	
<b>CO4</b> : Understand the various route to generate energy from biomass and other renewable resources	
<b>CO5</b> : Articulate various challenges associated with use of renewable energy sources.	

<b>Course Title</b>	<b>DISASTER MANAGEMENT</b>
<b>Course Code</b>	<b>01OE0007</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Build knowledge about the need and importance of disaster management in the concerned field	
<b>CO2</b> : Understand the causes of Natural and Manmade disasters	
<b>CO3</b> : Discuss the mitigation measures for Natural and Manmade disasters	
<b>CO4</b> : Understand the importance of science and technology in disaster risk management	
<b>CO5</b> : Apply the concept of Disasters management for realization of the responsibilities to society	

<b>Course Title</b>	<b>TAXATION-I</b>
<b>Course Code</b>	<b>04BC0308</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Understand the basic provisions of Income Tax Law in India	
<b>CO2</b> : Analyse availability of exemptions to the assessee	
<b>CO3</b> : Calculate income under the head of Income from Salary	
<b>CO4</b> : Apply provisions of the Act to compute income under the head of Income from House Property	
<b>CO5</b> : Calculate income under the head of Income from Profits and Gains of Business and Profession	



<b>Course Title</b>	<b>BUSINESS CORRESPONDENCE</b>
<b>Course Code</b>	<b>04BC0309</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Students will be able to understand the importance of Business Communication in the professional life	
<b>CO2 :</b> Students will be able to analyze the situation and make the relevant phrases in accordance with that.	
<b>CO3 :</b> Students will be able to understand communication jargons used in formal communication and reciprocate to them.	
<b>CO4 :</b> Students will be able to develop various business writing skills.	
<b>CO5 :</b> Students will be able to draft meeting related documents.	

<b>Course Title</b>	<b>FUNDAMENTALS OF STOCK MARKET</b>
<b>Course Code</b>	<b>04BC0322</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To acquaint the students with the latest concepts of the stock market with reference to recent developments.	
<b>CO2 :</b> To impart in-depth knowledge and determine the concepts of regulators in the Indian stock market.	
<b>CO3 :</b> To compare and analyze regarding the different types of stock analysis and Issue Management	
<b>CO4 :</b> To develop insights regarding concepts and mechanisms on stock exchanges and trading cycles.	
<b>CO5 :</b> To evaluate and examine the scams and scandals from the different stock exchanges around the world.	

<b>Course Title</b>	<b>COST ACCOUNTING – I</b>
<b>Course Code</b>	<b>04BC1301</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Students will understand the basic concepts and classify the cost based on theory	
<b>CO2 :</b> Students will select the material cost according to the nature of Business and design a control technique for inventory	
<b>CO3 :</b> Students will analyse the labour cost suitable for business	
<b>CO4 :</b> Students will apply the suitable overhead allocation, absorption and overhead techniques	
<b>CO5 :</b> To evaluate the latest trends in Costing Accounting relevant to Business	

<b>Course Title</b>	<b>FINANCIAL MANAGEMENT –I</b>
<b>Course Code</b>	<b>04BC1303</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Acquainting the students with basic understanding and applications of various financial decisions.	
<b>CO2 :</b> Application of the concept of time value of money in making financial decisions.	
<b>CO3 :</b> Evaluating the various sources of finance based on its cost of capital and time period	
<b>CO4 :</b> Understanding of valuations of shares and bonds through different methods of valuation.	
<b>CO5 :</b> Analysis of corporate working Capital from the viewpoint of cash management and receivable management.	



<b>Course Title</b>	<b>LEGAL ASPECTS OF BUSINESS</b>
<b>Course Code</b>	<b>04BC1305</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Comprehend the legal provisions in India related to Business.	
<b>CO2 :</b> Explain the basic elements of forming an enforceable contract and agreement.	
<b>CO3 :</b> Understand provisions regarding Indemnity, Guarantee and others.	
<b>CO4 :</b> Gain in-depth knowledge about sale and agreement to sell	
<b>CO5 :</b> Examine the features of partnerships and registrations process of the partnership.	
<b>CO6 :</b> To demonstrate understanding of the Limited Liability Partnership	

<b>Course Title</b>	<b>BASICS OF ACCOUNTING</b>
<b>Course Code</b>	<b>04OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand basics of accounting and cost concepts	
<b>CO2 :</b> To have knowledge of process of accounting;	
<b>CO3 :</b> To prepare final accounts of sole proprietor	
<b>CO4 :</b> Understand and evaluate concept of depreciation and its methods	

<b>Course Title</b>	<b>FUNDAMENTALS OF PERSONAL FINANCE</b>
<b>Course Code</b>	<b>04OE0003</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the fundamentals of Investments	
<b>CO2 :</b> Evaluate various investments alternatives.	
<b>CO3 :</b> Comprehend the implication of insurance in managing the risk of life and health	
<b>CO4 :</b> Apply the understanding of financial investment Personal Financial planning.	

<b>Course Title</b>	<b>DIGITAL MARKETING</b>
<b>Course Code</b>	<b>04OE0006</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the Digital Marketing Environment for business.	
<b>CO2 :</b> Compare and analyze various tools of Digital Marketing.	
<b>CO3 :</b> Understand Digital Display Ads, blogs and social media.	
<b>CO4 :</b> Comprehend the idea SEO & and their analytics.	





<b>Course Title</b>	<b>BASICS OF LAW</b>
<b>Course Code</b>	<b>10OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Students will be able to distinguish between the different types of laws.	
<b>CO2 :</b> To understand the intricacies of Civil and Criminal Law.	
<b>CO3 :</b> To discuss the importance of the fundamental concepts underlying Indian law.	
<b>CO4 :</b> To comprehend the importance of Information and Consumer Laws in the Country and will be able to know the remedies in relation to any violation of their rights.	

<b>Course Title</b>	<b>LEGAL ASPECTS OF BUSINESS</b>
<b>Course Code</b>	<b>10OE0002</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To evaluate and remember the basic elements of forming an enforceable contract and agreement	
<b>CO2 :</b> To evaluate and analyse the types of companies and its management.	
<b>CO3 :</b> To analyse and understand the importance of Promoters and Directors in a company	
<b>CO4 :</b> To understand and remember the basics of consumer law and Tax liabilities.	

<b>Course Title</b>	<b>INTRODUCTION TO INTELLECTUAL PROPERTY RIGHTS</b>
<b>Course Code</b>	<b>10OE0003</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To understand the fundamental aspects of Intellectual property Rights to students who are going to play a major role in development and management of innovative projects in industries.	
<b>CO2 :</b> To discuss the law on patents, the patent regime in India and its registration aspects.	
<b>CO3 :</b> To analyse the law relating copyrights and its related rights and registration aspects	
<b>CO4 :</b> To explain the law relating to trademarks and registration aspects	
<b>CO5 :</b> To demonstrate the concept of designs and legal issues involved in the same.	
<b>CO3 :</b> To summarize the basic understanding of the expanding horizons of IP.	

<b>Course Title</b>	<b>BASICS CONCEPT OF FITNESS AND HEALTH PROMOTION</b>
<b>Course Code</b>	<b>17OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO0 :</b> students should be able to perform basic fitness assessment & should understand basic cardiovascular, musculoskeletal and neurological conditions	

**STEP 8****Design Course Outcomes based on Revised Bloom's Taxonomy****Semester1**

<b>Course Title</b>	<b>ACCOUNTING FOR MANAGERS</b>
<b>Course Code</b>	<b>04MB0101</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To impart the basics of Financial Accounting and process for preparing Financial Statement of an entity	
<b>CO2 :</b> To equip students with theoretical and practical aspects of financial accounting statements	
<b>CO3 :</b> To make students aware about various financial statement analysis methods	
<b>CO4 :</b> To appraise the students about recent developments in accounting from a managerial perspective	
<b>CO5 :</b> To understand and implement the fundamentals of Financial Accounting for Business	

<b>Course Title</b>	<b>ECONOMICS FOR MANAGERS</b>
<b>Course Code</b>	<b>04MB0102</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To impart knowledge, with respect to principles and applications of Managerial economics in the market conditions.	
<b>CO2 :</b> To address business problems in a globalized economic environment.	
<b>CO3 :</b> To enhance the understanding capabilities of students about micro and macro-economic principles for decision making with the help of economic aspects	
<b>CO4 :</b> To apply economic analysis for decision making process	
<b>CO5 :</b> To use economic reasoning to solve the problems of business.	

<b>Course Title</b>	<b>STATISTICS FOR MANAGEMENT</b>
<b>Course Code</b>	<b>04MB0103</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Apply various Probability Distributions in analyzing Data and solving Decision Making Problems.	
<b>CO2 :</b> Apply appropriate Sampling Technique in Choosing a Representative Sample from a Population and Examine the Population Parameters using Estimation Techniques.	
<b>CO3 :</b> Interpret about the Population under study by applying various Hypothesis Testing Tools and arrive at conclusions about the Business Problem in hand.	
<b>CO4 :</b> Analyze business data using correlation and regression analysis techniques	
<b>CO5 :</b> Apply forecasting techniques using time-series analysis.	
<b>CO6 :</b> Understanding the science of gathering, analysing and using data. Understanding various quantitative tools and techniques relevant to business analysis	



<b>Course Title</b>	<b>ORGANISATIONAL BEHAVIOUR</b>
<b>Course Code</b>	<b>04MB0104</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To demonstrate the applicability of the concept of organizational behavior in order to understand the behavior of people in the organization.	
<b>CO2 :</b> To describe how individual personality and behavior impact the typical contemporary work experience	
<b>CO3 :</b> To identify different motivational theories and evaluate motivational strategies used in the variety of organizational settings.	
<b>CO4 :</b> To explain and explore the tension between individual versus groups and group dynamics in organizational life	
<b>CO5 :</b> To assess the impact of culture on organizational behavior	
<b>CO6 :</b> To evaluate the appropriateness of various leadership styles and conflict management strategies used in organizations.	

<b>Course Title</b>	<b>BUSINESS ANALYTICS</b>
<b>Course Code</b>	<b>04MB0105</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> 1. Judging business analytics and its role to support business decisions.	
<b>CO2 :</b> 2. Integrate ethical decision-making in structured or unstructured situations.	
<b>CO3 :</b> 3. Formulate appropriate analytical methods to find solutions to business problems.	
<b>CO4 :</b> 4. Evaluate basic framework for business intelligence systems and applications of business analytics.	
<b>CO5 :</b> 5. Integrate and Apply knowledge on Multidimensional Data Modeling and Data Warehousing to find solutions to business problems.	

<b>Course Title</b>	<b>BUSINESS COMMUNICATION</b>
<b>Course Code</b>	<b>04MB0106</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To explain the importance of business communication	
<b>CO2 :</b> To develop formal communication instincts among students and help them implement the same	
<b>CO3 :</b> To understand different dimensions of business communication	
<b>CO4 :</b> To apply the concepts of communication in day-to-day life	
<b>CO5 :</b> To understand the barriers to communication and the ways to overcome those in order to make communication effective	

<b>Course Title</b>	<b>ENTREPRENEURSHIP</b>
<b>Course Code</b>	<b>04MB0107</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the concept of Entrepreneurship, family business and corporate entrepreneurship	
<b>CO2 :</b> Apply the concepts and models of Entrepreneurship and analyze different entrepreneurial situations	
<b>CO3 :</b> Explain the entrepreneurial Mindset and Personality	



**CO4 :** Evaluate different opportunities of entrepreneurship and develop an entrepreneurial venture

<b>Course Title</b>	<b>IT APPLICATIONS IN MANAGEMENT</b>
<b>Course Code</b>	<b>04MB0108</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the major components of Computer Architectures.	
<b>CO2 :</b> Learn effective ways of Memory Management.	
<b>CO3 :</b> Study of different types of Operating Systems	
<b>CO4 :</b> Realize the Networking Concepts	

<b>Course Title</b>	<b>ADVANCED EXCEL</b>
<b>Course Code</b>	<b>04MB0109</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To apply advanced formatting tools, logical functions, and visualizations in excel to analyze the datasets.	
<b>CO2 :</b> To summarize and interpret data by using pivot tables, Pivot charts by creating dynamic dashboards.	
<b>CO3 :</b> To use data analysis tools in domain specific datasets	

<b>Course Title</b>	<b>CYBER SECURITY</b>
<b>Course Code</b>	<b>04MB0110</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the major concepts of Cybersecurity	
<b>CO2 :</b> Evaluate impact of attacks	
<b>CO3 :</b> implement different tools based solution for cyber attacks	
<b>CO4 :</b> Analyze cyber law with aspect to cybercrime and security	

## Semester2

<b>Course Title</b>	<b>FINANCIAL MANAGEMENT</b>
<b>Course Code</b>	<b>04MB0201</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Ability to understand fundamental concepts of finance, time value of money and Valuations of Bonds and Stock.	
<b>CO2 :</b> Able to apply concept of cost of capital and capital budgeting in business decision making	
<b>CO3 :</b> Analyze Financial decision and application of Leverage	
<b>CO4 :</b> Analyze the significance of dividend decision on value of firm	
<b>CO5 :</b> Application of various concept of working capital management and determination of working capita	





<b>Course Title</b>	<b>HUMAN RESOURCES MANAGEMENT</b>
<b>Course Code</b>	<b>04MB0202</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO4 :</b> To elaborate the role and importance of HRM	
<b>CO1 :</b> To evaluate the job analysis process and its role in HR planning and further assess various recruitment and selection methods.	
<b>CO2 :</b> To analyse the training and performance appraisal programs in the organisations.	
<b>CO3 :</b> To understand the concept and methods of compensation management.	

<b>Course Title</b>	<b>MARKETING MANAGEMENT</b>
<b>Course Code</b>	<b>04MB0203</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand fundamental marketing concepts, theories, and principles in areas of marketing.	
<b>CO2 :</b> Analyze the market based on segmentation, targeting and positioning.	
<b>CO3 :</b> Knowledge of consumer behavior and their decision-making process	
<b>CO4 :</b> Apply the knowledge, concepts, tools necessary to overcome challenges, and issues of marketing in a changing technological landscape.	
<b>CO5 :</b> Integrate product and service decisions with those on pricing, distribution and promotion.	

<b>Course Title</b>	<b>PRODUCTION AND OPERATIONS MANAGEMENT</b>
<b>Course Code</b>	<b>04MB0204</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Identify a broad survey of the concepts and tools used in operations Management	
<b>CO2 :</b> Understand the role of the operations management (OM) function in the performance of an organization	
<b>CO3 :</b> Apply the latest concepts and techniques of materials, stores, and purchase management.	
<b>CO4 :</b> Classify and analyze various inventory control methods and their applications in the industry.	
<b>CO5 :</b> Construct appropriate strategies for sustainable development of organization by applying green practices and Waste management techniques.	

<b>Course Title</b>	<b>BUSINESS RESEARCH METHODS</b>
<b>Course Code</b>	<b>04MB0205</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Appraise various sources of ethical dimensions of conducting research.	
<b>CO2 :</b> Designing the basic framework of research process, research designs its techniques.	
<b>CO3 :</b> Integrate and Apply knowledge on measurement & scaling techniques as well as sampling designs.	
<b>CO4 :</b> Formulate different hypothesis and practice its testing methods in business decision making process.	
<b>CO5 :</b> Appraise various sources of information for literature review.	



<b>Course Title</b>	<b>QUANTITATIVE TECHNIQUES FOR DECISION MAKING</b>
<b>Course Code</b>	<b>04MB0206</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Develop the skill and ability to express a given real-life situation into a linear programming format and solve them	
<b>CO2 :</b> Formulate and Apply relationship between linear programming and its dual problem and Distinguish between linear and integer programming problems.	
<b>CO3 :</b> Understand special cases of Linear Programming Problem and Apply transportation method in appropriate situation to numerous business problems.	
<b>CO4 :</b> Apply assignment method in appropriate situation to resource allocation problems.	
<b>CO5 :</b> Analyze the problems of decision making under probabilistic situations and Evaluate decision tree to solve business problems.	

<b>Course Title</b>	<b>COSTING FOR MANAGERS</b>
<b>Course Code</b>	<b>04MB0207</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Learn the utilization of techniques of costing while imparting managerial functions	
<b>CO2 :</b> To enhance the managerial decision making by utilizing various techniques of costing	
<b>CO3 :</b> Ability to decide whether to continue or discontinue of particular product or product line	
<b>CO4 :</b> Apply Standard costing techniques in managerial decision making	
<b>CO5 :</b> Access the variance between actual and budgeted and make suitable adjustments in the future to have a control on operations of the firm	

<b>Course Title</b>	<b>DIGITAL AND SOCIAL MEDIA MARKETING</b>
<b>Course Code</b>	<b>04MB0209</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the Digital Marketing Environment for business	
<b>CO2 :</b> Compare and analyze various social media platforms used for marketing	
<b>CO3 :</b> Comprehend the idea SEO & Digital Display Ads and their analytics	

<b>Course Title</b>	<b>PROGRAMMING AND CODING</b>
<b>Course Code</b>	<b>04MB0210</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Ability to devise a solution to a problem in various dimensions	
<b>CO2 :</b> Ability to express a solution in algorithmic and graphical forms	
<b>CO3 :</b> Ability to analyze and implement solutions using programming in C and Python language.	

### Semester3



<b>Course Title</b>	<b>STRATEGIC MANAGEMENT</b>
<b>Course Code</b>	<b>04MB0301</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To understand the strategic decisions that organizations make and have an ability to engage in strategic planning	
<b>CO2 :</b> To explain the basic concepts, principles and practices associated with strategy formulation and implementation	
<b>CO3 :</b> To evaluate challenges faced by managers in implementing and evaluating strategies based on the nature of business, industry, and cultural differences	
<b>CO4 :</b> To integrate and apply knowledge gained in basic courses to the formulation and implementation of strategy from holistic and multi-functional perspectives	
<b>CO5 :</b> To analyze the competitive situation and strategic dilemma in dealing with dynamic global business environments in terms of rapidly changing market trends and technological advancement.	
<b>CO6 :</b> To analyze and evaluate critically real-life company situations and develop creative solutions, using a strategic management perspective	

<b>Course Title</b>	<b>LEGAL ASPECTS OF BUSINESS</b>
<b>Course Code</b>	<b>04MB0302</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Students would be able to analyze the importance of law and legal institutions in business	
<b>CO2 :</b> Students would be able to exercise the laws relating to Indian Contract and Special Contract.	
<b>CO3 :</b> Students would be able to design strategic norms of Consumer protection and Company Acts.	
<b>CO4 :</b> Students would be able to analyze the Sales of Goods Act, 1930 and The Negotiable Instruments Act, 1881	
<b>CO5 :</b> Students would be able to execute Knowledge of LLP and IPR.	

<b>Course Title</b>	<b>INTERNATIONAL BUSINESS</b>
<b>Course Code</b>	<b>04MB0303</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Apply knowledge theories in global marketing to learn insights of different cross-cultural markets to gain insights.	
<b>CO2 :</b> Understand and examine historical transformations that led to the present moment of global conflicts.	
<b>CO1 :</b> Understand the wide problems between the countries related to natural resources and its effects on development, peace and security of a country.	
<b>CO1 :</b> Enhances different skill sets like planning, analysis, interpreting and evaluating information received across the globe through the internet to develop decision making capacity on an individual.	
<b>CO1 :</b> To understand and interpret different geographical issues which are directly related to international markets.	

<b>Course Title</b>	<b>INVESTMENT ANALYSIS AND PORTFOLIO MANAGEMENT</b>
<b>Course Code</b>	<b>04MB0304</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the different investment alternatives and their risk return pattern	
<b>CO2 :</b> Assess the valuation Of securities by applying fundamental and technical analysis	



<b>CO3</b> : Ability to judge the portfolio selection and find out optimum portfolio
<b>CO4</b> : Awareness about various portfolio selections models and adopts their suitability in their professional life
<b>CO5</b> : Ability to assess performance of portfolios by applying portfolio performance models

<b>Course Title</b>	<b>FINANCIAL STATEMENT ANALYSIS</b>
<b>Course Code</b>	<b>04MB0305</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : To apply several basic financial statement analysis techniques.	
<b>CO2</b> : To explain cash flow statement and return on invested capital and variations in its computation.	
<b>CO3</b> : To analyze earnings persistence, its determinants, and its relevance for earnings forecasting	
<b>CO4</b> : To describe the process for equity valuation through using financial statement and provide an understanding of Risk and Sensitivity Analysis.	
<b>CO5</b> : To prepare forecasted Balance Sheet, Income Statement, Cash flow Statement.	

<b>Course Title</b>	<b>FINANCIAL MARKETS AND INSTITUTIONS</b>
<b>Course Code</b>	<b>04MB0306</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Appreciate the need for and importance of Financial Markets and Institutions in India.	
<b>CO2</b> : Understand procedures of raising capital from the primary market and various legal aspects of Public Issue Management.	
<b>CO3</b> : Know Trading Mechanism and Settlement system of Secondary market.	
<b>CO4</b> : Apprehend various Financial and Non – Financial Institutions and regulatory aspects of such Institutions in Indian Financial System.	
<b>CO5</b> : Understanding the importance of various Non-Banking Financial institutions.	

<b>Course Title</b>	<b>FINANCIAL DERIVATIVES AND RISK MANAGEMENT</b>
<b>Course Code</b>	<b>04MB0309</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Demonstrate an understanding of the risk management approaches and techniques using derivatives	
<b>CO2</b> : Analyze the effectiveness of different hedging strategies using Forward and Futures contracts	
<b>CO3</b> : Formulate and solve problems requiring pricing derivative instruments and hedge market risk based on numerical data and current market trends	
<b>CO4</b> : Evaluate the effectiveness of different trading strategies using Call and Put Options	
<b>CO5</b> : Design & execute a swap using different underlying instruments such as interest rate and currency	

<b>Course Title</b>	<b>CONSUMER BEHAVIOR</b>
<b>Course Code</b>	<b>04MB0310</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Students should be aware of basics of Consumer Behavior and Consumer Decision Making	





**CO2 :** Students should be able to understand various theories of consumer behavior and learn its applications in the marketing field.

**CO3 :** Students should be able to analyze the product or service, its market and the factors affecting its purchase and usage.

**CO4 :** Evaluate and Correlate various models of consumer behavior with market situation

**CO5 :** Develop and implement successful marketing strategies by addressing Consumer's intrinsic and extrinsic Behavioral Factors

<b>Course Title</b>	<b>MARKETING COMMUNICATIONS</b>
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<b>Course Code</b>	<b>04MB0311</b>
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**Course Outcomes:**

After Successful completion of the above course, students will be able to:

**CO1 :** Understand the basic principles of IMC

**CO2 :** Remember the concepts of campaign design

**CO3 :** Analyze the campaigning techniques for promotion

**CO4 :** Evaluate the options of Marketing communication

**CO5 :** Understand strategies and tactics to develop an overall communications campaign

<b>Course Title</b>	<b>PRODUCT AND BRAND MANAGEMENT</b>
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<b>Course Code</b>	<b>04MB0312</b>
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**Course Outcomes:**

After Successful completion of the above course, students will be able to:

**CO1 :** Understand and define the purpose, process and model of brand building and its importance to the marketer.

**CO2 :** Understand the importance and the role of Brand Positioning and Brand Resonance & the process of acquiring the value through Brand Value Chain.

**CO3 :** Apply the concepts of Brand Elements for building the Brand Identity & Brand Personality.

**CO4 :** Formulate the Designing and Implementation of Branding Strategies such as Brand Extension, Brand Architecture and Brand Portfolio

**CO5 :** Analyze the various concepts and models of Brand Equity and calculate the Brand Equity using various methods.

**CO1 :** Understand the basic principles of IMC

<b>Course Title</b>	<b>CHANGE MANAGEMENT &amp; ORGANIZATION DEVELOPMENT</b>
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<b>Course Code</b>	<b>04MB0316</b>
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**Course Outcomes:**

After Successful completion of the above course, students will be able to:

**CO1 :** To understand different approaches to manage organizational changes

**CO2 :** To recognize common symptoms and reactions to change in the workplace and recommend interventions to address the resistance

**CO3 :** To determine the role of an OD practitioner as a facilitator and understand the key competencies suitable for application of OD interventions

**CO4 :** To recognize the need of managing change and various interventions in the organization

**CO5 :** To distinguish between reactions and resistance to change

**CO6 :** To examine OD techniques by means of behavioral simulations and cases.



<b>Course Title</b>	<b>HUMAN RESOURCE INFORMATION SYSTEM</b>
<b>Course Code</b>	<b>04MB0318</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To articulate the significance of incorporating a Human Resource information system in the organization.	
<b>CO2 :</b> To analyze and diagnose key deliverables of an HRIS needs analysis of organizations.	
<b>CO3 :</b> To justify the HRIS Investment and cost benefit analysis of HRIS in relation with direct and indirect benefits.	
<b>CO4 :</b> To identify the role of HRIS in different HR Functions in both domestic and multinational organisations.	
<b>CO5 :</b> To understand the importance of information security and privacy in today's technology-intensive and information-driven economy.	

<b>Course Title</b>	<b>HR ANALYTICS</b>
<b>Course Code</b>	<b>04MB0320</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Interpret the concepts, tools and techniques of HR Analytics.	
<b>CO1 :</b> Analyze the concepts of HCM:21 model of HR Analytics.	
<b>CO2 :</b> Apply appropriate measure for data collection and data visualization in HR.	
<b>CO2 :</b> Choose predictive modelling tool for HR data analysis.	
<b>CO1 :</b> Elaborate analytics for HR decision making.	

<b>Course Title</b>	<b>MANAGING DIVERSITY</b>
<b>Course Code</b>	<b>04MB0321</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To understand various theoretical implications and relevance of diversity	
<b>CO2 :</b> To relate dimensions of diversity to the contemporary organizations	
<b>CO1 :</b> To develop the organizational Strategies to manage diversity	
<b>CO2 :</b> To assess the impact of diversity in the organization's performance	
<b>CO2 :</b> To translate the idea of diversity in global perspective	

<b>Course Title</b>	<b>GLOBAL MARKETING</b>
<b>Course Code</b>	<b>04MB0322</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the different Cultural, political, and legal environments influencing Global Marketing.	
<b>CO2 :</b> Analyze how global brand and products price and distribution takes place.	
<b>CO3 :</b> Analyze how global decisions are taken related to advertising and marketing communications.	
<b>CO4 :</b> Develop skills related to data analysis, assessing the international marketing opportunities.	
<b>CO5 :</b> Develop international marketing strategies to enter various global markets.	



<b>Course Title</b>	<b>INTERNATIONAL ADVERTISING</b>
<b>Course Code</b>	<b>04MB0324</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understanding how to create and implement the basic types of marketing communication.	
<b>CO2 :</b> Understanding of the concept and process of integrated marketing communications,	
<b>CO3 :</b> Ability to apply knowledge in the field of marketing communications in practice	
<b>CO4 :</b> Ability to analyze, synthesize and predict solutions and consequences of phenomena in the field of marketing communication,	
<b>CO5 :</b> Understand CRM tools, Manage customer strategies and Understand CRM development team	

<b>Course Title</b>	<b>INDIA AND WTO</b>
<b>Course Code</b>	<b>04MB0325</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the functions of WTO and importance of Cross-Border Trade.	
<b>CO2 :</b> Analyse how the Foreign Trade investment impacts the emerging markets.	
<b>CO3 :</b> Implement the WTO policies in day-to-day routine for import and export business.	
<b>CO4 :</b> Explore the role of Indian entrepreneurs in context to WTO negotiations.	
<b>CO5 :</b> Analysis of the role of India with reference to WTO trade and finance.	

<b>Course Title</b>	<b>PROJECT MANAGEMENT</b>
<b>Course Code</b>	<b>04MB0351</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand Project Management.	
<b>CO2 :</b> Understand Monitoring and Controlling the Project	
<b>CO3 :</b> Evaluating and Terminating the Project.	
<b>CO4 :</b> Relate the importance of Project Management.	
<b>CO5 :</b> Illustrate Strategic implications of Project Planning.	
<b>CO6 :</b> Acquaintance with basics of Project management and execution.	

<b>Course Title</b>	<b>PERSONAL FINANCIAL MANAGEMENT</b>
<b>Course Code</b>	<b>04MB0354</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Acquainting themselves about essentials of finance and financial planning.	
<b>CO2 :</b> Be aware of protecting the resources by varieties of Insurance.	
<b>CO3 :</b> Evaluate the risk and return associated with different types of investments alternatives and construct an efficient portfolio.	
<b>CO4 :</b> Meet the client's wealth creation needs through financial planning.	



**CO5** : Competent in retirement planning and estate planning.

<b>Course Title</b>	<b>CUSTOMER RELATIONSHIP MANAGEMENT</b>
<b>Course Code</b>	<b>04MB0355</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Appreciate and evaluate Customer Relationship ,loyalty and success factor of CRM	
<b>CO2</b> : Analyze customer profitabulity and value Modeling and Understand Call Centre and customer satisfaction measurement	
<b>CO3</b> : Understand the Sales Force process , importance of Enterprises Resource Planning and Supplier Relationship Management	
<b>CO4</b> : Evaluate the concepts of Analytical CRM, managing and sharing customer data Base and Data Warehousing and Data mining,	
<b>CO5</b> : Understand CRM tools, Manage customer strategies and Understand CRM development team	

<b>Course Title</b>	<b>GOODS AND SERVICE TAX</b>
<b>Course Code</b>	<b>04MB0361</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Understand basics of GST and the concept of Supply in GST	
<b>CO2</b> : Analyse provisions of Input Tax Credit in GST	
<b>CO3</b> : Evaluate provisions concerning various GST returns to be filed by GST Dealer and Modes of Payment of GST	

<b>Course Title</b>	<b>ADVANCED CORPORATE COMMUNICATION</b>
<b>Course Code</b>	<b>04MB0362</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Develop oral and written skills required in the corporate world.	
<b>CO2</b> : Learn language functions required for interactions at a workplace.	
<b>CO3</b> : Make an effective oral presentation on a topic.	

<b>Course Title</b>	<b>INTERNATIONAL FINANCE</b>
<b>Course Code</b>	<b>04MB0370</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Provide comprehensive understanding of international business, its scope and significance for the financial manager	
<b>CO2</b> : Understand international parity relationship and evaluate forces affecting exchange rate.	
<b>CO3</b> : Analyze exposures associated with currency fluctuations and strategies to manage it.	
<b>CO4</b> : Evaluate the international financial market and its structure	
<b>CO5</b> : Appraise financial management of a multinational firms	

**STEP 8****Design Course Outcomes based on Revised Bloom's Taxonomy****Semester1**

<b>Course Title</b>	<b>PRINCIPLES OF MANAGEMENT</b>
<b>Course Code</b>	<b>04BB0101</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Explain the importance of management and describe the functions, roles, and skills of manager.	
<b>CO2 :</b> Discuss the evolution of Management thought and current practices of management	
<b>CO3 :</b> Demonstrate the ability to plan, organize, direct ,lead and control effectively	
<b>CO4 :</b> Assess managerial practices and choices of an organization	
<b>CO5 :</b> Comprehend the modern management techniques and its relevance in business	

<b>Course Title</b>	<b>MICRO ECONOMICS</b>
<b>Course Code</b>	<b>04BB0102</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To make acquainted the students with the basic concept of microeconomics.	
<b>CO2 :</b> To understand that economics is about the allocation of scarce resources and how that results in trade-offs.	
<b>CO3 :</b> To make student understand the demand and supply analysis in business applications To disseminate students with the production and cost structure under different stages of production.	
<b>CO4 :</b> To comprehend the pricing and output decisions under various market structure. To help students understand and apply the various decision tools to understand the market structure.	
<b>CO5 :</b> Use economic problem solving skills to discuss the opportunities and challenges of the increasing economy growth of the country	

<b>Course Title</b>	<b>FUNDAMENTALS OF ACCOUNTING</b>
<b>Course Code</b>	<b>04BB0103</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Analyze business transactions and will be able to prepare the Financial Statements	
<b>CO2 :</b> Apply the process of accounting	
<b>CO3 :</b> Understand and apply preparation of final accounts	
<b>CO4 :</b> Evaluate methods of depreciation	
<b>CO5 :</b> Understand methods of valuation of inventory	





<b>Course Title</b>	<b>COMPUTER ESSENTIALS &amp; OFFICE APPLICATIONS</b>
<b>Course Code</b>	<b>04BB0104</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand Fundamental Structure of a Computer System	
<b>CO2 :</b> Understand & Use Word Processor Utilities for Business using MS Word	
<b>CO3 :</b> Understand & Use Spreadsheet Utilities for Business using MS Excel	
<b>CO4 :</b> Understand & Design Presentations using MS Powerpoint	
<b>CO5 :</b> Use Google Workspace Utilities	

<b>Course Title</b>	<b>BUSINESS LAWS</b>
<b>Course Code</b>	<b>04BB0105</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Comprehend the legal provisions in India related to Business.	
<b>CO2 :</b> Explain the basic elements of forming an enforceable contract and agreement.	
<b>CO3 :</b> Gain in-depth knowledge about sale and agreement to sell	
<b>CO4 :</b> Understand various provisions related classification of Negotiable Instruments and reason of its dishonor.	
<b>CO5 :</b> Enumerate the types of companies its management and its rules of corporate governance.	
<b>CO6 :</b> Apply theoretical and practical learning to problems related to legal matters in their business	

<b>Course Title</b>	<b>TALLY</b>
<b>Course Code</b>	<b>04BH2101</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Gain complete knowledge of Tally software, theoretically as well as practically.	
<b>CO2 :</b> Generate various reports and statements using Tally.	
<b>CO3 :</b> Generate all types of GSTR using Tally	
<b>CO4 :</b> Manage the accounting of a firm using Tally software	

<b>Course Title</b>	<b>READING &amp; WRITING FOR BUSINESS</b>
<b>Course Code</b>	<b>04SL0102</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> to read and interpret formal business writings such as reports, articles and reviews;	
<b>CO2 :</b> to know structures of formal business letters and reports;	
<b>CO3 :</b> to write formal business letters and reports;	
<b>CO4 :</b> to inculcate a taste for reading and writing habits pertaining to the world of business.	



<b>Course Title</b>	<b>SPEAKING &amp; PRESENTATION SKILLS</b>
<b>Course Code</b>	<b>04SL0103</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Develop speaking skill in the context of Business	
<b>CO2</b> : Enhance presentation skills in the context of business	
<b>CO3</b> : Express ideas in an organized way for different communication situations	
<b>CO4</b> : Demonstrate adequate command over language in a spoken form	

## Semester2

<b>Course Title</b>	<b>MACROECONOMICS</b>
<b>Course Code</b>	<b>04BB0201</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : To explain the concept of macroeconomics and apply the circular flow of income and expenditure.	
<b>CO2</b> : To identify with the basics of national income accounting	
<b>CO3</b> : To analyze the income determination through classical and Keynesian economics	
<b>CO4</b> : To comprehend why household, business, government and global behavior determine the aggregate demand for goods and services.	
<b>CO5</b> : Learn the important concepts in money, banking and exchange and their significance in day to day life.	
<b>CO6</b> : To relate open economic interpretation to understand the operation of an economy	

<b>Course Title</b>	<b>ORGANIZATIONAL BEHAVIOR</b>
<b>Course Code</b>	<b>04BB0202</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Analyze individual and group behavior and understand the implications of organizational behaviour on the process of management.	
<b>CO2</b> : Identify different motivational theories and evaluate motivational strategies used in a variety of organizational settings.	
<b>CO3</b> : Understand individual differences and utilize them effectively in making groups to achieve organizational objectives.	
<b>CO4</b> : Evaluate the appropriateness of various leadership styles and conflict management strategies used in organizations	
<b>CO5</b> : Describe and assess the basic design elements of organizational structure and evaluate their impact on employees.	

<b>Course Title</b>	<b>STATISTICS FOR BUSINESS</b>
<b>Course Code</b>	<b>04BB0203</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Acquire a fair degree of proficiency in comprehending statistical data, processing and analyzing it.	
<b>CO2</b> : Apply various measures of central tendency and measures of dispersion in data analysis.	



**CO3** : Analyze the relationship between two variables using concepts of correlation and regression and its use in prediction.

**CO4** : Analyze the patterns revealed by the time series data and use it to make predictions for the future.

**CO5** : Analyze and apply the concept of probability and distributions in managerial decision making.

<b>Course Title</b>	<b>HUMAN RESOURCE MANAGEMENT</b>
<b>Course Code</b>	<b>04BB0204</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Explain the importance of human resources and their effective management in organizations.	
<b>CO2</b> : · Analyze the key issues related to administering the human elements such as recruitment, training, compensation, management development and employment relations.	
<b>CO3</b> : · Understand fundamentals and importance of Training and Development.	
<b>CO4</b> : · Analysis various components of Compensation	
<b>CO5</b> : Understand the process of job analysis and appreciate its importance as a foundation for human resource management practice.	

<b>Course Title</b>	<b>BUSINESS ENVIRONMENT</b>
<b>Course Code</b>	<b>04BB0205</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Understand the meaning and relationship of environment and business	
<b>CO2</b> : Know the characteristics of modern business	
<b>CO3</b> : Explain the competitive structure of an industry	
<b>CO4</b> : To scan various social, political, legal, economic and other factors that influence business in India.	
<b>CO5</b> : To foresee the impact of socio-economic changes at the national and international level on its stability.	

<b>Course Title</b>	<b>ENGLISH FOR WORKPLACE</b>
<b>Course Code</b>	<b>04SL0152</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Develop reading skills in the context of Business	
<b>CO2</b> : Apply writing skills for purposes related to Business	
<b>CO3</b> : Interpret written text and formulate appropriate written response	
<b>CO4</b> : Express their ideas in formal, academic written form in the context of Business	

<b>Course Title</b>	<b>ENGLISH THROUGH MOVIES</b>
<b>Course Code</b>	<b>04SL0153</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : The students will be able to develop Fluency and Accuracy in a contextual manner.	
<b>CO2</b> : The students will be able to comprehend specific language usage in audio - visual context.	
<b>CO3</b> : The students will be able to express Ideas in a comprehensive manner on a given topic.	



**CO4 :** The students will be able to learn to use film elements to enhance their language proficiency.

### Semester3

<b>Course Title</b>	<b>BASIC PROGRAMMING WITH C</b>
<b>Course Code</b>	<b>01OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Able to explain programming problems logically through flow charts and algorithms.	
<b>CO2 :</b> Identify programming principles using C Language.	
<b>CO3 :</b> Demonstrate problem solving skills through C Language.	

<b>Course Title</b>	<b>PYTHON FOR BEGINNERS</b>
<b>Course Code</b>	<b>01OE0002</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Familiar with the applications of Python and write python programs. and Describe the Python programming language.	
<b>CO2 :</b> Use variables to store, retrieve and calculate the information of real-world problems and Utilise core programming tools such as functions and loops for problem-solving	

<b>Course Title</b>	<b>RENEWABLE ENERGY &amp; ENERGY CONSERVATION</b>
<b>Course Code</b>	<b>01OE0003</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Differentiate between various types of energy sources.	
<b>CO2 :</b> Identify challenges and strength of various energy convention technologies	
<b>CO3 :</b> Analyse solar and wind energy technologies from system perspective.	
<b>CO4 :</b> Understand the various route to generate energy from biomass and other renewable resources	
<b>CO5 :</b> Articulate various challenges associated with use of renewable energy sources.	

<b>Course Title</b>	<b>INDUSTRY 4.0</b>
<b>Course Code</b>	<b>01OE0004</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the consequence of technology on industry	
<b>CO2 :</b> Identify the need of industry in 21st century	
<b>CO3 :</b> Understanding the shaping technology of Industry 4.0.	
<b>CO4 :</b> Roadmap for implementation industry 4.0	





CO5 : Application of various key technologies of Industry 4.0

<b>Course Title</b>	<b>DISASTER MANAGEMENT</b>
<b>Course Code</b>	<b>01OE0007</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
CO1 : Build knowledge about the need and importance of disaster management in the concerned field	
CO2 : Understand the causes of Natural and Manmade disasters	
CO3 : Discuss the mitigation measures for Natural and Manmade disasters	
CO4 : Understand the importance of science and technology in disaster risk management	
CO5 : Apply the concept of Disasters management for realization of the responsibilities to society	

<b>Course Title</b>	<b>FUNDAMENTAL SKILLS IN SENSOR INTERFACING</b>
<b>Course Code</b>	<b>01OE0008</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
CO1 : Understand application-based programming concept	
CO2 : To create programs for various open-source programmable boards	
CO3 : To develop programs for specific requirements with interfacing of various components and modules	
CO4 : To develop hardware and software interfacing for engineering applications	

<b>Course Title</b>	<b>STATISTICS AND IT'S APPLICATIONS</b>
<b>Course Code</b>	<b>02OE0004</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
CO1 : Understand the significance of large data sets and use them to validate mathematically the empirical phenomena.	
CO2 : Apply various statistical tools to obtain the results on the basis of theoretical concepts.	
CO3 : Analyze the graphical interpretation of the data sets and make valid inference.	
CO4 : Evaluate mathematically using appropriate identities, the large data sets and make valid conclusions.	
CO5 : Study the mathematical aspects and behavior of the data, by creating new data sets, and exploring new mathematical results.	

<b>Course Title</b>	<b>MARKETING MANAGEMENT</b>
<b>Course Code</b>	<b>04BB0301</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
CO1 : Comprehend Fundamental Marketing Concepts and marketing environment	
CO2 : Apprehend the concepts of Basic 4Ps of Marketing.	
CO3 : Understand and apply the concepts of Segmenting and Targeting Customers.	
CO4 : Comprehend various channels of distribution and various means of promotion	



**CO5 :** Understand and apply concept of product development and pricing strategies

<b>Course Title</b>	<b>FINANCIAL MANAGEMENT</b>
<b>Course Code</b>	<b>04BB0305</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand how to maximize shareholders value by applying various financial decision.	
<b>CO2 :</b> Compute cost of capital, capital budgeting, dividend decision and working capital.	
<b>CO3 :</b> Learn various sources of finance.	
<b>CO4 :</b> Understand capital structure theories and its importance.	

<b>Course Title</b>	<b>INDIAN FINANCIAL SYSTEM</b>
<b>Course Code</b>	<b>04BB0308</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To understand the fundamentals of Indian financial system.	
<b>CO2 :</b> To examine impact factors of Money Market and Capital Market and financial instruments.	
<b>CO3 :</b> To appreciate the Need and Working of Financial Intermediaries.	
<b>CO4 :</b> To recognize the importance and various functions of Market Regulation	
<b>CO5 :</b> To Analyze and choose the financial service as per requirements	

<b>Course Title</b>	<b>COST ACCOUNTING</b>
<b>Course Code</b>	<b>04BB0309</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand fundamentals of cost accounting	
<b>CO2 :</b> Analyse the cost concepts associated with material and labour	
<b>CO3 :</b> Evaluate and apply overheads apportionment and distribution	
<b>CO4 :</b> Learn to apply job and process costing methods	
<b>CO5 :</b> Understand operating costing and its application	

<b>Course Title</b>	<b>RESEARCH METHODOLOGY</b>
<b>Course Code</b>	<b>04BB1304</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the basics of research, types of research, research process and its ethical dimensions.	
<b>CO2 :</b> Design the basic framework of research process, research designs, its techniques as well as sampling methods.	
<b>CO3 :</b> Integrate and Apply knowledge on measurement & scaling techniques associated with framing of questionnaire.	
<b>CO4 :</b> Formulate different hypothesis and practice its testing methods in business decision making process.	
<b>CO5 :</b> Appraise various sources of information for literature review and writing reports.	



<b>Course Title</b>	<b>FUNDAMENTALS OF DIGITAL MARKETING</b>
<b>Course Code</b>	<b>04BB1307</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the Digital Marketing Environment for business	
<b>CO2 :</b> Understand Various Digital Marketing Platforms and its applications	
<b>CO3 :</b> Compare and Analyze various tools of Digital Marketing	
<b>CO4 :</b> Comprehend the idea SEO & Digital Display Ads	
<b>CO5 :</b> Evaluate Web-Analytics reports and Developing Appropriate Strategies	

<b>Course Title</b>	<b>CAREER READINESS PROGRAM</b>
<b>Course Code</b>	<b>04CR0301</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> After successful completion of this course, student will be able to inculcate smart approach in logical problem solving	
<b>CO2 :</b> After successful completion of this course, student will be able to improve their analytical skills	
<b>CO3 :</b> After successful completion of this course, student will be able to learn importance of soft skills, personality & people skills	
<b>CO4 :</b> After successful completion of this course, student will be able to apply right mindset to solve problems	

<b>Course Title</b>	<b>BASICS OF ACCOUNTING</b>
<b>Course Code</b>	<b>04OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand basics of accounting and cost concepts	
<b>CO2 :</b> To have knowledge of process of accounting;	
<b>CO3 :</b> To prepare final accounts of sole proprietor	
<b>CO4 :</b> Understand and evaluate concept of depreciation and its methods	

<b>Course Title</b>	<b>FUNDAMENTALS OF PERSONAL FINANCE</b>
<b>Course Code</b>	<b>04OE0003</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the fundamentals of Investments	
<b>CO2 :</b> Evaluate various investments alternatives.	
<b>CO3 :</b> Comprehend the implication of insurance in managing the risk of life and health	
<b>CO4 :</b> Apply the understanding of financial investment Personal Financial planning.	



<b>Course Title</b>	<b>DIGITAL MARKETING</b>
<b>Course Code</b>	<b>04OE0006</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the Digital Marketing Environment for business.	
<b>CO2 :</b> Compare and analyze various tools of Digital Marketing.	
<b>CO3 :</b> Understand Digital Display Ads, blogs and social media.	
<b>CO4 :</b> Comprehend the idea SEO & and their analytics.	

<b>Course Title</b>	<b>CYBER SECURITY FUNDAMENTALS</b>
<b>Course Code</b>	<b>05OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand Cybercrime and terminologies of cyber security	
<b>CO2 :</b> Evaluate impact of attacks	
<b>CO3 :</b> Analyze system and network security vulnerabilities.	
<b>CO4 :</b> Implement and evaluate different tools for cybercrime attacks	
<b>CO5 :</b> Analyze cyber fraud impact in digital era	

<b>Course Title</b>	<b>BASICS OF LAW</b>
<b>Course Code</b>	<b>10OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Students will be able to distinguish between the different types of laws.	
<b>CO2 :</b> To understand the intricacies of Civil and Criminal Law.	
<b>CO3 :</b> To discuss the importance of the fundamental concepts underlying Indian law.	
<b>CO4 :</b> To comprehend the importance of Information and Consumer Laws in the Country and will be able to know the remedies in relation to any violation of their rights.	

<b>Course Title</b>	<b>LEGAL ASPECTS OF BUSINESS</b>
<b>Course Code</b>	<b>10OE0002</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To evaluate and remember the basic elements of forming an enforceable contract and agreement	
<b>CO2 :</b> To evaluate and analyse the types of companies and its management.	
<b>CO3 :</b> To analyse and understand the importance of Promoters and Directors in a company	
<b>CO4 :</b> To understand and remember the basics of consumer law and Tax liabilities.	





<b>Course Title</b>	<b>INTRODUCTION TO INTELLECTUAL PROPERTY RIGHTS</b>
<b>Course Code</b>	<b>10OE0003</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To understand the fundamental aspects of Intellectual property Rights to students who are going to play a major role in development and management of innovative projects in industries.	
<b>CO2 :</b> To discuss the law on patents, the patent regime in India and its registration aspects.	
<b>CO3 :</b> To analyse the law relating copyrights and its related rights and registration aspects	
<b>CO4 :</b> To explain the law relating to trademarks and registration aspects	
<b>CO5 :</b> To demonstrate the concept of designs and legal issues involved in the same.	
<b>CO3 :</b> To summarize the basic understanding of the expanding horizons of IP.	

<b>Course Title</b>	<b>PHARMA MARKETING MANAGEMENT</b>
<b>Course Code</b>	<b>13OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> The course aims to provide an understanding of marketing concepts and techniques related to their applications in the pharmaceutical industry.	

<b>Course Title</b>	<b>BASICS CONCEPT OF FITNESS AND HEALTH PROMOTION</b>
<b>Course Code</b>	<b>17OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO0 :</b> students should be able to perform basic fitness assessment & should understand basic cardiovascular, musculoskeletal and neurological conditions	



**STEP 8****Design Course Outcomes based on Revised Bloom's Taxonomy****Semester1**

<b>Course Title</b>	<b>PRINCIPLES OF MANAGEMENT</b>
<b>Course Code</b>	<b>04BB0101</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Explain the importance of management and describe the functions, roles, and skills of manager.	
<b>CO2 :</b> Discuss the evolution of Management thought and current practices of management	
<b>CO3 :</b> Demonstrate the ability to plan, organize, direct ,lead and control effectively	
<b>CO4 :</b> Assess managerial practices and choices of an organization	
<b>CO5 :</b> Comprehend the modern management techniques and its relevance in business	

<b>Course Title</b>	<b>MICRO ECONOMICS</b>
<b>Course Code</b>	<b>04BB0102</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To make acquainted the students with the basic concept of microeconomics.	
<b>CO2 :</b> To understand that economics is about the allocation of scarce resources and how that results in trade-offs.	
<b>CO3 :</b> To make student understand the demand and supply analysis in business applications To disseminate students with the production and cost structure under different stages of production.	
<b>CO4 :</b> To comprehend the pricing and output decisions under various market structure. To help students understand and apply the various decision tools to understand the market structure.	
<b>CO5 :</b> Use economic problem solving skills to discuss the opportunities and challenges of the increasing economy growth of the country	

<b>Course Title</b>	<b>FUNDAMENTALS OF ACCOUNTING</b>
<b>Course Code</b>	<b>04BB0103</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Analyze business transactions and will be able to prepare the Financial Statements	
<b>CO2 :</b> Apply the process of accounting	
<b>CO3 :</b> Understand and apply preparation of final accounts	
<b>CO4 :</b> Evaluate methods of depreciation	
<b>CO5 :</b> Understand methods of valuation of inventory	



<b>Course Title</b>	<b>COMPUTER ESSENTIALS &amp; OFFICE APPLICATIONS</b>
<b>Course Code</b>	<b>04BB0104</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand Fundamental Structure of a Computer System	
<b>CO2 :</b> Understand & Use Word Processor Utilities for Business using MS Word	
<b>CO3 :</b> Understand & Use Spreadsheet Utilities for Business using MS Excel	
<b>CO4 :</b> Understand & Design Presentations using MS Powerpoint	
<b>CO5 :</b> Use Google Workspace Utilities	

<b>Course Title</b>	<b>BUSINESS LAWS</b>
<b>Course Code</b>	<b>04BB0105</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Comprehend the legal provisions in India related to Business.	
<b>CO2 :</b> Explain the basic elements of forming an enforceable contract and agreement.	
<b>CO3 :</b> Gain in-depth knowledge about sale and agreement to sell	
<b>CO4 :</b> Understand various provisions related classification of Negotiable Instruments and reason of its dishonor.	
<b>CO5 :</b> Enumerate the types of companies its management and its rules of corporate governance.	
<b>CO6 :</b> Apply theoretical and practical learning to problems related to legal matters in their business	

<b>Course Title</b>	<b>READING &amp; WRITING FOR BUSINESS</b>
<b>Course Code</b>	<b>04SL0102</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> to read and interpret formal business writings such as reports, articles and reviews;	
<b>CO2 :</b> to know structures of formal business letters and reports;	
<b>CO3 :</b> to write formal business letters and reports;	
<b>CO4 :</b> to inculcate a taste for reading and writing habits pertaining to the world of business.	

<b>Course Title</b>	<b>SPEAKING &amp; PRESENTATION SKILLS</b>
<b>Course Code</b>	<b>04SL0103</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Develop speaking skill in the context of Business	
<b>CO2 :</b> Enhance presentation skills in the context of business	
<b>CO3 :</b> Express ideas in an organized way for different communication situations	
<b>CO4 :</b> Demonstrate adequate command over language in a spoken form	



<b>Course Title</b>	<b>MACROECONOMICS</b>
<b>Course Code</b>	<b>04BB0201</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To explain the concept of macroeconomics and apply the circular flow of income and expenditure.	
<b>CO2 :</b> To identify with the basics of national income accounting	
<b>CO3 :</b> To analyze the income determination through classical and Keynesian economics	
<b>CO4 :</b> To comprehend why household, business, government and global behavior determine the aggregate demand for goods and services.	
<b>CO5 :</b> Learn the important concepts in money, banking and exchange and their significance in day to day life.	
<b>CO6 :</b> To relate open economic interpretation to understand the operation of an economy	

<b>Course Title</b>	<b>ORGANIZATIONAL BEHAVIOR</b>
<b>Course Code</b>	<b>04BB0202</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Analyze individual and group behavior and understand the implications of organizational behaviour on the process of management.	
<b>CO2 :</b> Identify different motivational theories and evaluate motivational strategies used in a variety of organizational settings.	
<b>CO3 :</b> Understand individual differences and utilize them effectively in making groups to achieve organizational objectives.	
<b>CO4 :</b> Evaluate the appropriateness of various leadership styles and conflict management strategies used in organizations	
<b>CO5 :</b> Describe and assess the basic design elements of organizational structure and evaluate their impact on employees.	

<b>Course Title</b>	<b>STATISTICS FOR BUSINESS</b>
<b>Course Code</b>	<b>04BB0203</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Acquire a fair degree of proficiency in comprehending statistical data, processing and analyzing it.	
<b>CO2 :</b> Apply various measures of central tendency and measures of dispersion in data analysis.	
<b>CO3 :</b> Analyze the relationship between two variables using concepts of correlation and regression and its use in prediction.	
<b>CO4 :</b> Analyze the patterns revealed by the time series data and use it to make predictions for the future.	
<b>CO5 :</b> Analyze and apply the concept of probability and distributions in managerial decision making.	

<b>Course Title</b>	<b>HUMAN RESOURCE MANAGEMENT</b>
<b>Course Code</b>	<b>04BB0204</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Explain the importance of human resources and their effective management in organizations.	
<b>CO2 :</b> · Analyze the key issues related to administering the human elements such as recruitment, training, compensation, management development and employment relations.	





**CO3 :** · Understand fundamentals and importance of Training and Development.

**CO4 :** · Analysis various components of Compensation

**CO5 :** Understand the process of job analysis and appreciate its importance as a foundation for human resource management practice.

<b>Course Title</b>	<b>BUSINESS ENVIRONMENT</b>
<b>Course Code</b>	<b>04BB0205</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the meaning and relationship of environment and business	
<b>CO2 :</b> Know the characteristics of modern business	
<b>CO3 :</b> Explain the competitive structure of an industry	
<b>CO4 :</b> To scan various social, political, legal, economic and other factors that influence business in India.	
<b>CO5 :</b> To foresee the impact of socio-economic changes at the national and international level on its stability.	

<b>Course Title</b>	<b>ENGLISH FOR WORKPLACE</b>
<b>Course Code</b>	<b>04SL0152</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Develop reading skills in the context of Business	
<b>CO2 :</b> Apply writing skills for purposes related to Business	
<b>CO3 :</b> Interpret written text and formulate appropriate written response	
<b>CO4 :</b> Express their ideas in formal, academic written form in the context of Business	

<b>Course Title</b>	<b>ENGLISH THROUGH MOVIES</b>
<b>Course Code</b>	<b>04SL0153</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> The students will be able to develop Fluency and Accuracy in a contextual manner.	
<b>CO2 :</b> The students will be able to comprehend specific language usage in audio - visual context.	
<b>CO3 :</b> The students will be able to express Ideas in a comprehensive manner on a given topic.	
<b>CO4 :</b> The students will be able to learn to use film elements to enhance their language proficiency.	

### Semester3

<b>Course Title</b>	<b>BASIC PROGRAMMING WITH C</b>
<b>Course Code</b>	<b>01OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Able to explain programming problems logically through flow charts and algorithms.	
<b>CO2 :</b> Identify programming principles using C Language.	



**CO3** : Demonstrate problem solving skills through C Language.

<b>Course Title</b>	<b>PYTHON FOR BEGINNERS</b>
<b>Course Code</b>	<b>01OE0002</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Familiar with the applications of Python and write python programs. and Describe the Python programming language.	
<b>CO2</b> : Use variables to store, retrieve and calculate the information of real-world problems and Utilise core programming tools such as functions and loops for problem-solving	

<b>Course Title</b>	<b>RENEWABLE ENERGY &amp; ENERGY CONSERVATION</b>
<b>Course Code</b>	<b>01OE0003</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Differentiate between various types of energy sources.	
<b>CO2</b> : Identify challenges and strength of various energy convention technologies	
<b>CO3</b> : Analyse solar and wind energy technologies from system perspective.	
<b>CO4</b> : Understand the various route to generate energy from biomass and other renewable resources	
<b>CO5</b> : Articulate various challenges associated with use of renewable energy sources.	

<b>Course Title</b>	<b>INDUSTRY 4.0</b>
<b>Course Code</b>	<b>01OE0004</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Understand the consequence of technology on industry	
<b>CO2</b> : Identify the need of industry in 21st century	
<b>CO3</b> : Understanding the shaping technology of Industry 4.0.	
<b>CO4</b> : Roadmap for implementation industry 4.0	
<b>CO5</b> : Application of various key technologies of Industry 4.0	

<b>Course Title</b>	<b>DISASTER MANAGEMENT</b>
<b>Course Code</b>	<b>01OE0007</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1</b> : Build knowledge about the need and importance of disaster management in the concerned field	
<b>CO2</b> : Understand the causes of Natural and Manmade disasters	
<b>CO3</b> : Discuss the mitigation measures for Natural and Manmade disasters	
<b>CO4</b> : Understand the importance of science and technology in disaster risk management	
<b>CO5</b> : Apply the concept of Disasters management for realization of the responsibilities to society	



<b>Course Title</b>	<b>FUNDAMENTAL SKILLS IN SENSOR INTERFACING</b>
<b>Course Code</b>	<b>01OE0008</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand application-based programming concept	
<b>CO2 :</b> To create programs for various open-source programmable boards	
<b>CO3 :</b> To develop programs for specific requirements with interfacing of various components and modules	
<b>CO4 :</b> To develop hardware and software interfacing for engineering applications	

<b>Course Title</b>	<b>STATISTICS AND IT'S APPLICATIONS</b>
<b>Course Code</b>	<b>02OE0004</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the significance of large data sets and use them to validate mathematically the empirical phenomena.	
<b>CO2 :</b> Apply various statistical tools to obtain the results on the basis of theoretical concepts.	
<b>CO3 :</b> Analyze the graphical interpretation of the data sets and make valid inference.	
<b>CO4 :</b> Evaluate mathematically using appropriate identities, the large data sets and make valid conclusions.	
<b>CO5 :</b> Study the mathematical aspects and behavior of the data, by creating new data sets, and exploring new mathematical results.	

<b>Course Title</b>	<b>MARKETING MANAGEMENT</b>
<b>Course Code</b>	<b>04BB0301</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Comprehend Fundamental Marketing Concepts and marketing environment	
<b>CO2 :</b> Apprehend the concepts of Basic 4Ps of Marketing.	
<b>CO3 :</b> Understand and apply the concepts of Segmenting and Targeting Customers.	
<b>CO4 :</b> Comprehend various channels of distribution and various means of promotion	
<b>CO5 :</b> Understand and apply concept of product development and pricing strategies	

<b>Course Title</b>	<b>FINANCIAL MANAGEMENT</b>
<b>Course Code</b>	<b>04BB0305</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand how to maximize shareholders value by applying various financial decision.	
<b>CO2 :</b> Compute cost of capital, capital budgeting, dividend decision and working capital.	
<b>CO3 :</b> Learn various sources of finance.	
<b>CO4 :</b> Understand capital structure theories and its importance.	



<b>Course Title</b>	<b>INDIAN FINANCIAL SYSTEM</b>
<b>Course Code</b>	<b>04BB0308</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To understand the fundamentals of Indian financial system.	
<b>CO2 :</b> To examine impact factors of Money Market and Capital Market and financial instruments.	
<b>CO3 :</b> To appreciate the Need and Working of Financial Intermediaries.	
<b>CO4 :</b> To recognize the importance and various functions of Market Regulation	
<b>CO5 :</b> To Analyze and choose the financial service as per requirements	

<b>Course Title</b>	<b>COST ACCOUNTING</b>
<b>Course Code</b>	<b>04BB0309</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand fundamentals of cost accounting	
<b>CO2 :</b> Analyse the cost concepts associated with material and labour	
<b>CO3 :</b> Evaluate and apply overheads apportionment and distribution	
<b>CO4 :</b> Learn to apply job and process costing methods	
<b>CO5 :</b> Understand operating costing and its application	

<b>Course Title</b>	<b>RESEARCH METHODOLOGY</b>
<b>Course Code</b>	<b>04BB1304</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the basics of research, types of research, research process and its ethical dimensions.	
<b>CO2 :</b> Design the basic framework of research process, research designs, its techniques as well as sampling methods.	
<b>CO3 :</b> Integrate and Apply knowledge on measurement & scaling techniques associated with framing of questionnaire.	
<b>CO4 :</b> Formulate different hypothesis and practice its testing methods in business decision making process.	
<b>CO5 :</b> Appraise various sources of information for literature review and writing reports.	

<b>Course Title</b>	<b>FUNDAMENTALS OF DIGITAL MARKETING</b>
<b>Course Code</b>	<b>04BB1307</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the Digital Marketing Environment for business	
<b>CO2 :</b> Understand Various Digital Marketing Platforms and its applications	
<b>CO3 :</b> Compare and Analyze various tools of Digital Marketing	
<b>CO4 :</b> Comprehend the idea SEO & Digital Display Ads	
<b>CO5 :</b> Evaluate Web-Analytics reports and Developing Appropriate Strategies	





<b>Course Title</b>	<b>CAREER READINESS PROGRAM</b>
<b>Course Code</b>	<b>04CR0301</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> After successful completion of this course, student will be able to inculcate smart approach in logical problem solving	
<b>CO2 :</b> After successful completion of this course, student will be able to improve their analytical skills	
<b>CO3 :</b> After successful completion of this course, student will be able to learn importance of soft skills, personality & people skills	
<b>CO4 :</b> After successful completion of this course, student will be able to apply right mindset to solve problems	

<b>Course Title</b>	<b>BASICS OF ACCOUNTING</b>
<b>Course Code</b>	<b>04OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand basics of accounting and cost concepts	
<b>CO2 :</b> To have knowledge of process of accounting;	
<b>CO3 :</b> To prepare final accounts of sole proprietor	
<b>CO4 :</b> Understand and evaluate concept of depreciation and its methods	

<b>Course Title</b>	<b>FUNDAMENTALS OF PERSONAL FINANCE</b>
<b>Course Code</b>	<b>04OE0003</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the fundamentals of Investments	
<b>CO2 :</b> Evaluate various investments alternatives.	
<b>CO3 :</b> Comprehend the implication of insurance in managing the risk of life and health	
<b>CO4 :</b> Apply the understanding of financial investment Personal Financial planning.	

<b>Course Title</b>	<b>DIGITAL MARKETING</b>
<b>Course Code</b>	<b>04OE0006</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand the Digital Marketing Environment for business.	
<b>CO2 :</b> Compare and analyze various tools of Digital Marketing.	
<b>CO3 :</b> Understand Digital Display Ads, blogs and social media.	
<b>CO4 :</b> Comprehend the idea SEO & and their analytics.	



<b>Course Title</b>	<b>CYBER SECURITY FUNDAMENTALS</b>
<b>Course Code</b>	<b>05OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Understand Cybercrime and terminologies of cyber security	
<b>CO2 :</b> Evaluate impact of attacks	
<b>CO3 :</b> Analyze system and network security vulnerabilities.	
<b>CO4 :</b> Implement and evaluate different tools for cybercrime attacks	
<b>CO5 :</b> Analyze cyber fraud impact in digital era	

<b>Course Title</b>	<b>BASICS OF LAW</b>
<b>Course Code</b>	<b>10OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> Students will be able to distinguish between the different types of laws.	
<b>CO2 :</b> To understand the intricacies of Civil and Criminal Law.	
<b>CO3 :</b> To discuss the importance of the fundamental concepts underlying Indian law.	
<b>CO4 :</b> To comprehend the importance of Information and Consumer Laws in the Country and will be able to know the remedies in relation to any violation of their rights.	

<b>Course Title</b>	<b>LEGAL ASPECTS OF BUSINESS</b>
<b>Course Code</b>	<b>10OE0002</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To evaluate and remember the basic elements of forming an enforceable contract and agreement	
<b>CO2 :</b> To evaluate and analyse the types of companies and its management.	
<b>CO3 :</b> To analyse and understand the importance of Promoters and Directors in a company	
<b>CO4 :</b> To understand and remember the basics of consumer law and Tax liabilities.	

<b>Course Title</b>	<b>INTRODUCTION TO INTELLECTUAL PROPERTY RIGHTS</b>
<b>Course Code</b>	<b>10OE0003</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> To understand the fundamental aspects of Intellectual property Rights to students who are going to play a major role in development and management of innovative projects in industries.	
<b>CO2 :</b> To discuss the law on patents, the patent regime in India and its registration aspects.	
<b>CO3 :</b> To analyse the law relating copyrights and its related rights and registration aspects	
<b>CO4 :</b> To explain the law relating to trademarks and registration aspects	
<b>CO5 :</b> To demonstrate the concept of designs and legal issues involved in the same.	
<b>CO3 :</b> To summarize the basic understanding of the expanding horizons of IP.	



<b>Course Title</b>	<b>PHARMA MARKETING MANAGEMENT</b>
<b>Course Code</b>	<b>13OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO1 :</b> The course aims to provide an understanding of marketing concepts and techniques related to their applications in the pharmaceutical industry.	

<b>Course Title</b>	<b>BASICS CONCEPT OF FITNESS AND HEALTH PROMOTION</b>
<b>Course Code</b>	<b>17OE0001</b>
<b>Course Outcomes:</b> After Successful completion of the above course, students will be able to:	
<b>CO0 :</b> students should be able to perform basic fitness assessment & should understand basic cardiovascular, musculoskeletal and neurological conditions	



**COURSE OUTCOME**

**FACULTY OF TECHNOLOGY**



Batch	Stream	Sem	Subject Code	Sr No	Course Out Comes
1718	INFORMATION AND COMMUNICATION TECHNOLOGY	1	01CE0102	CO1 :	Understand the basic concept and structure of computer hardware and networking.
			01CE0102	CO2 :	Identify the existing configuration of the computers and peripherals.
			01CE0102	CO3 :	Upgrading the system as and when required.
			01CE0102	CO4 :	Apply their knowledge about computer peripherals to identify / rectify problems onboard.
			01CE0102	CO5 :	Integrate the PCs into local area network and re-install operating system and various application programs.
			01CE0102	CO6 :	Manage data backup and restore operations on computer and update application software.
			01CT0101	CO1 :	Understand Flowchart, Algorithms and Pseudocode that helps to develop logical base of any problem statement (Understand)
			01CT0101	CO2 :	Understand the usage of different primitive, derived and user defined datatypes (Understand)
			01CT0101	CO3 :	Analyze the use of different conditional and looping control statements in a complex problem (Analyze)
			01CT0101	CO4 :	Apply the knowledge of decisional control statements to deal with preprocessors, macros, pointers and file management to enhance the coding skills. (Apply)
			01CT0101	CO5 :	Apply overall programming knowledge that brings the solution of real world problems/ use cases. (Apply)
			01EC0101	CO1 :	Understand the Voltage current and operation of semiconductor devices, circuits and operational Amplifier.
			01EC0101	CO2 :	Apply basic fundamentals of semiconductor devices and operational amplifier to illustrate/show the operation of application.
			01EC0101	CO3 :	Apply the basic knowledge of simulation tool & Circuit level concepts to synthesize real life problems.
			01EC0101	CO4 :	Analyze the behavior of Electronics circuits containing Semiconductor device, Operational Amplifier or Verify using Modern tools.
			01EC0101	CO5 :	Design, implement and analyze of electronic circuits to solve the problem with in society.
			01EE0104	CO1 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions.
			01EE0104	CO2 :	Analyze different types of magnetic circuit.
			01EE0104	CO3 :	Describe qualitative comparison between AC and DC system.
			01EE0104	CO4 :	Analyse and solve DC Circuits and AC Circuits with network theorems.
			01EE0104	CO5 :	Obtain two port parameters of given electric network
			01EE0104	CO6 :	Analyse earth resistance to ensure safe and quality working environment.
			01MA0101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
			01MA0101	CO2 :	apply and solve first order differential equations to real life problems
			01MA0101	CO3 :	.Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
			01MA0101	CO4 :	Apply partial differentiation to evaluate equations of tangent plane and normal line for given surface.
			01MA0101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
			01MA0101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
			01SL0102	CO0 :	To enhance reading skills for academic purposes.
			01SL0102	CO1 :	To enhance reading skills for academic purposes
			01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes

<b>1718</b>	<b>INFORMATION AND COMMUNICATION TECHNOLOGY</b>	<b>1</b>	01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
			01SL0102	CO4 :	To express their ideas in formal, academic written form
			01SL0103	CO1 :	Develop speaking competence for academic purpose
			01SL0103	CO2 :	Speak on a given topic in the context of technology
			01SL0103	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements
			01SL0103	CO4 :	Enhance the ability to make a presentation on a given topic
		<b>2</b>	01CR0101	CO1 :	Understands how to use different tools of language in order to communicate effectively.
			01CR0101	CO2 :	Applies appropriate grammatical structures and a wide range of vocabulary in spoken and written discourse.
			01CR0101	CO3 :	Choose appropriate alternatives in personal and professional life.
			01CR0101	CO4 :	Displaying the best of the professional attitude and behavior.
			01CT0102	CO1 :	Differentiate linear and non-linear data structures like stacks, queues, linked list etc. (Understand)
			01CT0102	CO2 :	Choose appropriate data structure as applied to specified problem definition. (Apply)
			01CT0102	CO3 :	Demonstrate operations like searching, insertion, deletion, traversing mechanism etc. on various data structures through programming (Apply)
			01CT0102	CO4 :	Select appropriate sorting and searching algorithm based on problem definition in order to get optimum solution. (Analyze)
			01CT0102	CO5 :	Compare and contrast the benefits of dynamic and static data structures implementations. (Evaluate)
			01EC0102	CO1 :	Develop understanding of basic digital circuits like logic gates, logic families, flip flops and memory devices
			01EC0102	CO2 :	Use knowledge of various number systems and binary codes to solve conversion problems.
			01EC0102	CO3 :	Apply concepts of Boolean algebra and other minimization techniques for digital circuit design.
			01EC0102	CO4 :	Design digital circuits using different combinational and sequential logic.
			01EC0102	CO5 :	Implement various combinational and sequential circuits using appropriate hardware/simulation.
			01EE0102	CO1 :	Understand usage of different types of electrical & electronics tools, Cables, Switches, Electronics component (active & passive) and measuring instruments (Understand)
			01EE0102	CO2 :	Study and compare fuse, MCB, ELCB as protective Devices and to understand criticality of their function. (Evaluate)
			01EE0102	CO3 :	Understand circuits for Staircase wiring, Godown wiring, and induction motor starters. (understand)
			01EE0102	CO4 :	Study and compare use of different types of lamps, wiring of tube light and to measure and comment on sufficiency of Illumination level. (Evaluate)
			01EE0102	CO5 :	Carry out soldering & de-soldering electronics component on General Purpose Board. (Apply)
			01EE0102	CO6 :	Design hardware based project and trouble shoots the problems of related project. (Analysis)
			01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
			01EN0101	CO2 :	Know the importance of natural resources for the sustainable development of life.
			01EN0101	CO3 :	Understand the effect of growing population on the Environment.
			01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
			01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.

<b>1718</b>	<b>INFORMATION AND COMMUNICATION TECHNOLOGY</b>	<b>2</b>	01MA0151	CO1 :	Explain the linear dependence of vectors of different vector space.
			01MA0151	CO2 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.
			01MA0151	CO3 :	Understand the role of multiple integral in finding volume of three dimensional objects, finding area between to two curves, finding moment of inertia etc.
			01MA0151	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
			01MA0151	CO5 :	Check the convergence and divergence of various functions which are expandable in infinite terms.
			01MA0151	CO6 :	Gain the fundamental knowledge about special function like Beta and Gamma and its applications.
			01ME0105	CO1 :	Interpret engineering drawings using fundamental technical mathematics.
			01ME0105	CO2 :	Construct basic and intermediate geometry.
			01ME0105	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
			01ME0105	CO4 :	To improve their technical communication skill in the form of communicative drawings.
			01ME0105	CO5 :	To sketch engineering objects in freehand mode.
			01ME0105	CO6 :	To create 3D computer model and its realization using FDM based 3D printing.
		<b>3</b>	01CR0302	CO1 :	Express the basics of human values.
			01CR0302	CO2 :	Articulate human values and grow as responsible human beings in the society
			01CR0302	CO3 :	Develop ethical conduct and deliver their professional duties.
			01CR0302	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level
			01CT0301	CO1 :	To apply knowledge of the processor's internal registers and operations by use of a PC based microprocessor simulator.
			01CT0301	CO2 :	Understand and describe the basics of various architectural units of the Computer System.
			01CT0301	CO3 :	Apply the knowledge of combinational and sequential logical circuits to mimica simple computer architecture.
			01CT0301	CO4 :	List and specify the various features of microprocessor, memory and I/O devices including concepts of system bus.
			01CT0301	CO5 :	To write assembly language programs and download the machine code that will provide solutions to real-world control problems.
			01CT0301	CO6 :	Recognize the importance of parallelism and stall in computer architecture.
			01CT0302	CO1 :	Understand about various types of signals, classify them, analyze them, and perform various operations on them.
			01CT0302	CO2 :	Understand about various types of systems, classify them, analyze them and understand their response behavior.
			01CT0302	CO3 :	Appreciate use of transforms in analysis of signals and system.
			01CT0302	CO4 :	Carry simulation on signals and systems for observing effects of applying various properties and operations.
			01CT0302	CO5 :	Create strong foundation of signal processing to be studied in the subsequent semester
			01CT0303	CO1 :	Understand various concepts of Signals,data communication, networking, switching techniques, transmission media and communication systems.(Apply)
			01CT0303	CO2 :	Compare various analog to analog, analog to digital, digital to analog and digital to digital modulation techniques,(Analyze)
			01CT0303	CO3 :	Analyze various concepts and methods for enhancement of channel capacity. (Analyze)
			01CT0303	CO4 :	Analyze performance parameters of radio receiver(apply)
		01CT0303	CO5 :	Understand concepts of optical and satellite communication system(Understand)	

<b>1718</b>	<b>INFORMATION AND COMMUNICATION TECHNOLOGY</b>	<b>3</b>	01CT0304	CO1 :	Use Object Oriented Programming concepts for problem solving.
			01CT0304	CO2 :	Apply OOP principles to create java application programs and proper program structuring.
			01CT0304	CO3 :	Ensure design stability for various applications- by applying exception handling and inheritance
			01CT0304	CO4 :	Implement multithreading, Interfaces and class collection with the help of Utensils package and Construct GUI and I/O based window application.
			01CT0304	CO5 :	Analyze the various techniques of OOP to reduce programming complexity.
			01CT0304	CO6 :	
			01CT0305	CO1 :	Learn to create Pie charts, plots and vectors
			01CT0305	CO2 :	Performing sorting, analyze variance and the cluster
			01CT0305	CO3 :	Learn Data Science concepts of R and functioning of R-Calculator
			01CT0305	CO4 :	ODBC Tables reading, linear and logistic regression
			01CT0305	CO5 :	Understand database connectivity
			01CT0305	CO6 :	Understand the applications of machine learning and various prediction models using R
			01CT0306	CO1 :	Understand the broad scope of Design engineering(Understand)
			01CT0306	CO2 :	Apply concepts and methods of design engineering to identify real world problems.(Apply)
			01CT0306	CO3 :	Apply creativity to explore the various solution of a real-world problems.(Apply)
		01CT0306	CO4 :	Demonstrate communication skill, presentation skill and information handling ability through various structured activities of design engineering(Evaluate)	
		01MA0231	CO1 :	Understand graphs, Logic and Lattices.	
		01MA0231	CO2 :	Apply abstract concept of Predicate in design of computing machines, data structures for programming languages.	
		01MA0231	CO3 :	Apply concept of Boolean algebra in switching theory and building basic electronic circuits.	
		01MA0231	CO4 :	Apply concepts of Kruskal's algorithm to find the shortest possible distance between two objects.	
		01MA0231	CO5 :	Apply concepts of graph theory in data mining and networking.	
		<b>4</b>	01CE0401	CO1 :	Understanding the role of operating system with its function and services. (Understanding)
			01CE0401	CO2 :	Compare Various Algorithm used for CPU Scheduling, Memory management and Disk Scheduling Algorithm. (Evaluate)
			01CE0401	CO3 :	Apply Various Concepts related with Deadlock to solve Problems. (Apply)
			01CE0401	CO4 :	Analyze Protection and Security Mechanism in Operating System. (Analyze)
			01CT0401	CO1 :	Understand the needs of probability and distribution
			01CT0401	CO2 :	Apply the mathematical treatment for random variable and joint probability distribution.
			01CT0401	CO3 :	Draw various graphs for the descriptive statistical analysis for the given data set and develop basic inference sense from it.
			01CT0401	CO4 :	Apply appropriate probability distribution model, central limit for the given test cases.
			01CT0401	CO5 :	Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases also Learn non-parametric test such as the Chi-Square test for Independence as well as Goodness of Fit.
			01CT0401	CO6 :	Perform Statistical analysis study like descriptive statistics, correlation and regression using professional software.
			01CT0402	CO0 :	
			01CT0402	CO1 :	Compare various algorithm design techniques for developing algorithms by evaluating the asymptotic complexities and time-space trade-off.

1718	INFORMATION AND COMMUNICATION TECHNOLOGY	4	01CT0402	CO2 :	Develop different algorithms using various methods like dynamic and Greedy methods
			01CT0402	CO3 :	Select appropriate pattern matching algorithm to develop model for substring, subsequence, DNA matching, etc
			01CT0402	CO4 :	Evaluate various graph algorithms for sparse and dense network structures
			01CT0402	CO5 :	Distinguish between Polynomial, Non Polynomial complete and Hard problems
			01CT0403	CO1 :	Acquire basic knowledge of microcontroller and utilize real time software and hardware for embedded systems using AVR Atmega-32 microcontroller.
			01CT0403	CO2 :	Understand architecture of Atmega-32, its pin configuration, data-types, instruction set, addressing modes and advance communication protocols like SPI, I2C etc.
			01CT0403	CO3 :	Develop assembly and C language programs for ADC, EEPROM, PWM and Timer by applying various instructions like data transfer, ALU, Branch, subroutine etc.
			01CT0403	CO4 :	Analyse I/O peripherals like LCD, Keyboard, Relay, Sensor, Motor etc. by interfacing it with AVR microcontroller.
			01CT0403	CO5 :	Evaluate minor microcontroller based projects that solves real world problems.
			01CT0404	CO0 :	.
			01CT0404	CO1 :	To understand basics of analog and digital communication techniques.
			01CT0404	CO2 :	To learn working of AM-FM Transmitters and receivers.
			01CT0404	CO3 :	To facilitate the understanding of the baseband and carrier modulation.
			01CT0404	CO4 :	To understand the effect and performance of communication systems in presence of noise.
			01CT0404	CO5 :	Analyze Communication System based on different Modulation & Demodulation Techniques and analyze performance.
			01CT0405	CO1 :	Build up a basic understanding in several applied electromagnetic topic and to gain knowledge in cutting-edge research areas in electrodynamics.
			01CT0405	CO2 :	Build up a basic understanding in electromagnetics and antenna theories.
			01CT0405	CO3 :	Create basic antenna structures for various applications
		01CT0405	CO4 :	Understand the advance optical antenna concepts and its application.	
		01CT0406	CO1 :	Write the E-Mails in professional manner	
		01CT0406	CO2 :	Read and understand the research paper	
		01CT0406	CO3 :	Identify the keywords and elaborate the research done in the field of the identified keyword	
		01CT0406	CO4 :	Prepare a technical Presentation	
		01CT0406	CO5 :	Write a technical Research paper or document.	
		5	01CT0501	CO1 :	Cast engineering minima/maxima problems into optimization framework
			01CT0501	CO2 :	Learn efficient computational procedures to solve optimization problems.
			01CT0501	CO3 :	Apply optimizational concepts to deal with real world situations
			01CT0501	CO4 :	Design the simulation model for the given case study problem
			01CT0502	CO1 :	Understand the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra, normalization and SQL. (Understand Level)
			01CT0502	CO2 :	Solve the given problem using Relational Algebra, Relational Calculus, SQL and PL/SQL. (Apply Level).
			01CT0502	CO3 :	Analyse basic data storage schemes and real-life database applications. (Analyse Level).
			01CT0502	CO4 :	Apply efficient query optimization techniques to solve different problems (Apply Level).
			01CT0502	CO5 :	Perform PL/SQL programming using concept of Cursor Management, Error Handling, Package and Triggers (Evaluate Level).

<b>1718</b>	<b>INFORMATION AND COMMUNICATION TECHNOLOGY</b>	<b>5</b>	01CT0503	CO1 :	Understand the functionality of various protocols, models and networks.
			01CT0503	CO2 :	Analyze various flow and error control algorithms
			01CT0503	CO3 :	Analyze different medium access protocols and network hardware component.
			01CT0503	CO4 :	compare various static and dynamic routing protocol.
			01CT0503	CO5 :	Understand various transport services, protocol and application layer functionalities.
			01CT0503	CO6 :	Built and test various network topologies and routing protocols for various networks scenarios.
			01CT0504	CO1 :	Understand basis functioning of Internet by studying its architecture.
			01CT0504	CO2 :	Apply different types of style sheets and their properties.
			01CT0504	CO3 :	Apply client side and server side scripting techniques as per requirements.
			01CT0504	CO4 :	Analyse design pattern based approaches and frameworks of PHP.
			01CT0504	CO5 :	Create dynamic web based solution based on user requirements.
			01CT0505	CO1 :	Setup raspberry pi as standalone computer with SSH remote access. (AP)
			01CT0505	CO2 :	Use python to write and debug Raspberry pi interfaces like GPIO, Serial and I2C and interface User IO, Sensors and actuators (AP)
			01CT0505	CO3 :	Implement MQTT client and broker on raspberry pi and test publish subscribe mechanism using python (AP)
			01CT0505	CO4 :	Analyze QoS levels, last will, retain message and wild card topics in MQTT network by writing and testing python code. (AN)
			01CT0505	CO5 :	Use raspberry pi in designing stand alone application for solve real world problem. (E)
			01CT0506	CO1 :	Demonstrate knowledge of the role of specific techniques in human-centered design
			01CT0506	CO2 :	Conduct user interviews and synthesize learnings to uncover insights and identify opportunities for innovation
			01CT0506	CO3 :	Bring ideas to life using prototypes to test with real users and identify promising solutions to implement
			01CT0506	CO4 :	Practice team management, leadership and project management
			01CT0507	CO1 :	Understand ARMv7 and ARMv7 CortexM Architecture.
			01CT0507	CO2 :	Develop real-time software and hardware for embedded systems using Cortex M Microcontroller.
			01CT0507	CO3 :	Write and debug C programs for Cortex-M Microcontroller.
			01CT0507	CO4 :	Effectively utilize on chip peripherals such as timers, serial communications, analog-to-digital converters & pulse width modulation for low power applications.
			01CT0507	CO5 :	Implement advanced communication protocols like I2C and SPI on Cortex-M Microcontroller
			01CT0507	CO6 :	Effectively utilize ARMv7 and ARMv7 CortexM based microcontroller to solves real world problems.
			01CT0509	CO1 :	Understand Linux utilities to create and manage simple file processing operations and Linux boot processing. [Understand]
			01CT0509	CO2 :	Apply Command line in Linux to manage user, user groups, system management, volume management, and troubleshooting application, scheduling task, and system-level issue. [Apply]
			01CT0509	CO3 :	Illustrate client-server applications with appropriate security. [Apply]
			01CT0509	CO4 :	Configure various services of Linux such as DNS, Apache web server, virtualization. [Analyze]
			01CT0509	CO5 :	Evaluate various shell Scripting. [Evaluate]
			01CT0510	CO1 :	Implement various computer oriented numerical methods
			01CT0510	CO2 :	Implement methods of roots and curve fitting

<b>1718</b>	<b>INFORMATION AND COMMUNICATION TECHNOLOGY</b>	<b>5</b>	01CT0510	CO3 :	Apply Matrices based computational methods for various problems
			01CT0510	CO4 :	Apply numerical integration and differentiation
			01CT0510	CO5 :	Identify numerical solution of various equations
			01CT0511	CO1 :	Understand theory behind computer's thinking capacity
			01CT0511	CO2 :	Apply Turing Machine concept to solve the simple problems.
			01CT0511	CO3 :	Apply this basic knowledge of Theory of Computation in the computer field to solve computational problems and in the field of compiler also.
			01CT0511	CO4 :	Analyze design of model of decision-making power of computer
			01CT0511	CO5 :	Evaluate Automata logics for real life problem solving.
			01GS0501	CO1 :	Develop thinking skills by practicing on complex numerical computations
			01GS0501	CO2 :	Inculcate smart approach in numerical problem solving
			01GS0501	CO3 :	Apply the concepts in both competitive exams and placement drives
			01GS0501	CO4 :	Solve real-life problems requiring interpretation and comparison of complex numeric summaries
			01GS0501	CO5 :	Create and use visual displays of data
		<b>6</b>	01CR0601	CO1 :	Contrast and understand short pieces of business correspondence reports or proposals. (Understanding)
			01CR0601	CO2 :	Read and Categorize the extracts from business publications. Ask for information required. (Analyzing)
			01CR0601	CO3 :	Listen to, understand and contribute to discussions in meetings. (Remembering)
			01CR0601	CO4 :	Prepare the presentation on a familiar topic. (Applying)
			01CT0601	CO1 :	Understand Digital Signal Processing using concepts of Discrete time signals and systems.
			01CT0601	CO2 :	Analyse the signals in both time and frequency domain
			01CT0601	CO3 :	Implement various realisation structures of FIR and IIR filters.
			01CT0601	CO4 :	Interpret design method of FIR and IIR Filters.
			01CT0601	CO5 :	Apply signal processing to various areas such as speech and audio processing, image processing, biomedical signal processing.
			01CT0602	CO1 :	Illustrate the fundamentals of cellular architecture and channel capacity.
			01CT0602	CO2 :	Summarize the principles and architecture of wireless systems and standards
			01CT0602	CO3 :	Analyze the mobile radio propagation, diversity, fading and the channel modeling.
			01CT0602	CO4 :	Analyze Multiuser systems like CDMA, FDMA, TDMA, WCDMA and OFDM concepts
			01CT0602	CO5 :	create mobile app by Implementing concepts of mobile computing for IoT field using android platform.
01CT0603	CO1 :	Understand method of analysis of already existing systems			
01CT0603	CO2 :	Distribute the system in small functional units and analyse the system in detail			
01CT0603	CO3 :	Identify possible improvements and solutions to decrease development cost or timings associated with development and improved functionality or usability			
01CT0603	CO4 :	Suggest required change/es in existing system to make it more efficient with prototype, schematic plan or dirty mock-ups			
01CT0607	CO1 :	Apply the fundamentals of probability theory and algebra to perceive the gist of supervised machine learning algorithms			
01CT0607	CO2 :	Understand and apply unsupervised algorithm for clustering			

<b>1718</b>	<b>INFORMATION AND COMMUNICATION TECHNOLOGY</b>	<b>6</b>	01CT0607	CO3 :	Apply the concepts of dimensionality reduction, regularization and optimization in different real-world problems
			01CT0607	CO4 :	Evaluate various machine learning algorithms with appropriate evaluation metrics
			01CT0607	CO5 :	Demonstrate training and testing of basic neural network models like CNN, RNN, LSTM, etc.
			01CT0607	CO6 :	Implement appropriate machine learning algorithms for the given case study
			01CT0609	CO1 :	Acquire basics of VLSI design flow, its designing methodologies, its hierarchical structure and testability concepts of digital logic design.
			01CT0609	CO2 :	Develop fundamentals for CMOS fabrication methods and analyze static and switching characteristics of MOS inverter.
			01CT0609	CO3 :	Apply lambda based design rules for subsystem combinational and sequential circuit design.
			01CT0609	CO4 :	Design an application with concepts of modeling a digital system using Hardware Description Language.
			01CT0609	CO5 :	Create layout of simple MOS circuits using lambda based design rules.
			01CT0611	CO1 :	Understand the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, various management and other distinguish services of AWS.
			01CT0611	CO2 :	Apply the fundamental concepts in datacenters to understand the trade-offs in power, efficiency and cost by the Load balancing approach and instances.
			01CT0611	CO3 :	Illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems such as Amazon S3 and Database.
			01CT0611	CO4 :	Analyze various clouds Service models and apply them to solve problems on the cloud.
			01CT0611	CO5 :	Deploy applications over commercial cloud computing infrastructures such as AWS.
			01CT0612	CO1 :	Understand data warehouse concepts, architecture, business analysis and tools
			01CT0612	CO2 :	Apply data pre-processing and data visualization techniques.
			01CT0612	CO3 :	Evaluate algorithms for finding hidden and interesting patterns in data
			01CT0612	CO4 :	Apply various classification and clustering techniques using tools.
			01CT0612	CO5 :	Evaluate different scenarios where we can implement different data mining and warehousing techniques and finding hidden and interesting patterns in real dataset.
			01CT0613	CO1 :	Understand the use of C# basics, Objects and Types, Inheritance and .NET framework developed by Microsoft.
			01CT0613	CO2 :	Develop and implement applications with C#.
			01CT0613	CO3 :	Analyze the Component Services, Threading, Remoting, Windows services, web services.
			01CT0613	CO4 :	Apply the concepts of Object oriented programming and C# to make console and windows applications.
			01CT0613	CO5 :	Design the functional web application using the concepts of ADO .NET, various server controls, State management and MVC Architecture.
			01GS0601	CO1 :	Inculcate smart approach in logical problem solving.
			01GS0601	CO2 :	Comprehend text of varying difficulty levels and types.
			01GS0601	CO3 :	Analyze logical and verbal problems to arrive at a solution/conclusion.
			01GS0601	CO4 :	Use logical deductions to make effective decisions.
			01GS0601	CO5 :	Apply the concepts in both competitive exams and placement drives.
			01IT0601	CO1 :	Understand various software engineering principles and their application (Understand)
			01IT0601	CO2 :	Demonstrate use of various Agile methodologies for software development (Apply)
			01IT0601	CO3 :	Apply various modelling techniques for designing system requirement (Apply)



1718	INFORMATION AND COMMUNICATION TECHNOLOGY	6	01IT0601	CO4 :	Identify different types of risk and evaluate its impact on software system (Evaluate)
			01IT0601	CO5 :	Distinguish different testing strategies and Create test cases. (Create)
			01IT0601	CO6 :	Able to understand and apply the basic project management practices in real life projects (Apply)
		7	01CT0701	CO1 :	Compare Various Cryptanalysis Techniques. (Understand)
			01CT0701	CO2 :	Apply the knowledge in the applications ranging from small scale to larger-scale security systems. (Apply)
			01CT0701	CO3 :	Apply knowledge in interpreting the secured systems for real-world problems. (Apply)
			01CT0701	CO4 :	Analyze the encryption standards and the security strengths of the applied cryptographic algorithm (Analyse)
			01CT0701	CO5 :	Evaluate the performance of the given case study application and solve the fault to improve the security standards (Evaluate)
			01CT0702	CO1 :	Understand information channels and explain the working of various source and channel coding algorithms. [Understand]
			01CT0702	CO2 :	Calculate information measures for various discrete channels and coding schemes. [Apply]
			01CT0702	CO3 :	Design codewords for given probability distributions using various source and channel coding algorithms. [Apply]
			01CT0702	CO4 :	Distinguish the relationship between information parameters and analyze statistics for various coding algorithms. [Analyse]
			01CT0702	CO5 :	Construct coding algorithms, related matrices, polynomials, encoding, and decoding diagrams. [Create]
			01CT0703	CO1 :	Understand the appropriate technique and algorithm for reasoning and developing the solution within an AI problem domain [Understand]
			01CT0703	CO2 :	Identify the appropriate representation of the AI problem or domain model [Understand]
			01CT0703	CO3 :	Compare the performance of the AI system or component [Evaluate]
			01CT0703	CO4 :	Analyze the gaps and improve the research quality for an existing AI problem [Analyse]
			01CT0703	CO5 :	Develop the solution for an existing AI problem using the concepts of Neural Nets, NLP, Game Theory, Recommendation System, and Reinforcement Learnings. [Apply]
			01CT0704	CO1 :	Understand the role of management information systems in achieving competitive business advantage through informed decision making. [Understand]
			01CT0704	CO2 :	Analyze how information technology affects a firm in terms of value creation and brings strategic benefits to a firm. [Analyse]
			01CT0704	CO3 :	Interpret how to use information technology to solve business problems. [Understand]
			01CT0704	CO4 :	Develop meaningful decision-making capacity for the purpose of acquisition, development, deployment, and management of information systems. [Apply]
			01CT0705	CO1 :	Understand the Verilog Hardware Description Language
			01CT0705	CO2 :	Model the combinational and sequential circuits using Verilog
			01CT0705	CO3 :	Verify the digital design with simulation
			01CT0705	CO4 :	Analyze the different Verilog modeling style
			01CT0705	CO5 :	Interpret the data sheets of CPLD and FPGA
			01CT0706	CO1 :	Understand the foundations of image formation and the working of vision algorithms. [Understand]
			01CT0706	CO2 :	Implement low, mid, and high-level vision algorithms. [Apply]
			01CT0706	CO3 :	Apply computer vision techniques on images and videos to get the desired output. [Apply]
		01CT0706	CO4 :	Analyze the strengths and weaknesses of different vision methods and techniques for vision problems. [Analyse]	

<b>1718</b>	<b>INFORMATION AND COMMUNICATION TECHNOLOGY</b>	<b>7</b>	01CT0706	CO5 :	Develop an application using computer vision concepts. [Create]
			01CT0708	CO1 :	Gain an Understanding of Big Data Technology and its Tools. (Understand)
			01CT0708	CO2 :	Understand and apply to extract useful patterns from large datasets. (Apply)
			01CT0708	CO3 :	Implementation of Big data mining techniques using different software. (Create)
			01CT0708	CO4 :	Understand how data analytics and data science maps to current industry. (Analyze)
			01CT0708	CO5 :	Understanding and implementing Algorithms in an optimized way using various Big Data Tools. (Apply)
			01CT0709	CO1 :	Describe the components of J2EE Architecture, MVC Framework and Multi-tier Application and Various Network Protocol. (Understand)
			01CT0709	CO2 :	To make use of Servlet and JSP API in the process of enterprise application deployment. (Apply)
			01CT0709	CO3 :	Implement components such as Session, Filters, JSTL, Beans. (Apply)
			01CT0709	CO4 :	Distinguish Application Server, Web Container, JDBC and ORM tools.(Analyze)
			01CT0709	CO5 :	Design and Development of web application having collaboration of Servlets, JSPs, JSF, Spring and Hibernate base upon the requirement. (Create)
			01CT0713	CO1 :	Illustrate and explain basic concepts of Kotlin programming. (Understand)
			01CT0713	CO2 :	Understand the architecture and user interface of android. (Understand)
			01CT0713	CO3 :	Select appropriate controls and layouts based on problem definition. (Analyze)
			01CT0713	CO4 :	Understand the real-life situation and solve it using advanced features, APIs and sensors available in android with SQLite database. (Apply)
		01CT0713	CO5 :	Build, publish and monetize the Android apps using Kotlin programming. (Create)	
		<b>8</b>	01CT0801	CO1 :	Investigate the chosen topic in depth
			01CT0801	CO2 :	Apply the concepts and theories learnt in previous subjects
			01CT0801	CO3 :	Apply the various methodologies to design project for specific application
			01CT0801	CO4 :	Explore the new ideas & the possible areas to work ahead
			01CT0801	CO5 :	Sharpen the skills in specific direction
			01CT0802	CO1 :	Learn Flutter and Dart from the ground up, step-by-step
			01CT0802	CO2 :	Build engaging native mobile apps for both Android and iOS
			01CT0802	CO3 :	Use features like Google Maps, the device camera, authentication and much more
			01CT0802	CO4 :	Learn how to upload images and how to send manual and automated push notifications
			01CT0802	CO5 :	Learn all the basics without stopping after them: Dive deeply into Flutter & Dart and become an advanced developer
			01CT0803	CO1 :	Grow a Business Online from Scratch
			01CT0803	CO2 :	Make Money as an Affiliate Marketer
			01CT0803	CO3 :	Land a High-Paying Job in Digital Marketing
			01CT0803	CO4 :	Work from Home as a Freelance Marketer
			01CT0804	CO1 :	Learn the basic design flow in VLSI physical design domain
			01CT0804	CO2 :	Learn the static timing analysis
			01CT0804	CO3 :	Learn floor planning and partitioning
01CT0804	CO4 :		Learn clock routing		
01CT0804	CO5 :		Learn concepts of DFT and BIST		
01CT0804	CO6 :		Learn low power design techniques		
01CT0805	CO1 :	Examine and improve an ineffective visualization			

1718	INFORMATION AND COMMUNICATION TECHNOLOGY	8	01CT0805	CO2 :	Effectively present data visually to enhance audience comprehension of findings and insights.
			01CT0805	CO3 :	Apply best practices of data visualization .
			01CT0805	CO4 :	Create and design visualizations that work best for the target audience.
			01CT0805	CO5 :	Find and select appropriate data that can be used in order to create a visualization that answers a particular research question.
			01CT0806	CO1 :	Use Advance database tool like MongoDB to its full potential in future projects.
			01CT0806	CO2 :	Write efficient and well-performing queries to fetch data in the format you need it.
			01CT0806	CO3 :	Use all features advance database offers you to work with data efficiently.
			01CT0806	CO4 :	Ability to apply acquired knowledge for developing holistic solutions based on advance database systems/database techniques.
			01CT0806	CO5 :	Analyse and use emerging technologies such as various frameworks of BigData and Advance Tools of BigData.
			01CT0807	CO1 :	Describes the function of network layer and types of networks
			01CT0807	CO2 :	Interpret different types of IP Address and sub-netting for different scenarios
			01CT0807	CO3 :	Classify types of routing and characteristics of routing protocols
			01CT0807	CO4 :	Demonstrate the use of line commands for different operation and configuration of router and switch
			01CT0807	CO5 :	Built, modify and test various network topology, access control mechanism with different routing protocols
			01CT0808	CO1 :	Learn the basic FPGA Architecture
			01CT0808	CO2 :	Learn configuration of FPGA
			01CT0808	CO3 :	Learn the concepts of reconfigurable FPGA
			01CT0808	CO4 :	Learn complex FPGA based systems
			01CT0808	CO5 :	Learn design flow of FPGA based systems
			01CT0809	CO0 :	Discover how to design and write robust and maintainable object-oriented code by applying SOLID principles.
			01CT0810	CO1 :	Discuss the concepts of Game design and development.
			01CT0810	CO2 :	Design the processes, and use mechanics for game development.
			01CT0810	CO3 :	Explain the Core architectures of Game Programming.
			01CT0810	CO4 :	Use Game programming platforms, frame works and engines.
			01CT0810	CO5 :	Create interactive Games.
			01CT0811	CO1 :	Diagnose a team’s delivery pipeline and bring forward prioritized recommendations to improve it.
			01CT0811	CO2 :	Explain the skill sets and roles involved in DevOps and how they contribute toward a continuous delivery capability.
			01CT0811	CO3 :	Review and deliver automation tests across the development stack.
			01CT0811	CO4 :	Explain the key jobs of system operations and how today’s leading techniques and tools apply to them.
			01CT0811	CO5 :	Explain how high-functioning teams use DevOps and related methods to reach a continuous delivery capability.
			01CT0811	CO6 :	Facilitate prioritized, iterative team progress on improving a delivery pipeline.
			01CT0812	CO1 :	Understand how to build a convolutional neural network, including recent variations such as residual networks.
			01CT0812	CO2 :	Apply convolutional networks to visual detection and recognition tasks.
			01CT0812	CO3 :	Apply transfer learning to object localization and detection.
			01CT0812	CO4 :	Apply object detection models such as regional-CNN and ResNet-50, customize existing models, and build your own models to detect, localize, and label your own rubber duck images.

<b>1718</b>	<b>INFORMATION AND COMMUNICATION TECHNOLOGY</b>	<b>8</b>	01CT0812	CO5 :	Implement image segmentation using variations of the fully convolutional network (FCN) including U-Net and Mask-RCNN to identify and detect numbers, pets, zombies, and more.
			01CT0813	CO1 :	Understanding of Linux architecture and acquire the skills needed for building an OS for Embedded systems
			01CT0813	CO2 :	Ability to do Linux programming
			01CT0813	CO3 :	Analyse the complete setup of BeagleBone board used especially for Linux based embedded system and to do the programming for the same
			01CT0813	CO4 :	Write the programs for interfacing various components with BeagleBone board
			01CT0813	CO5 :	Ability to install, configure and booting Angstrom Linux on BeagleBone board
			01CT0815	CO1 :	Apply framework environment for user input, forms and validation.
			01CT0815	CO2 :	Analyse different authentication techniques using encryption / decryption.
			01CT0815	CO3 :	Deploy third party services into the application.
			01CT0815	CO4 :	Create dynamic web application with the use of advance concepts of web technology to achieve optimization in coding.
			01CT0815	CO5 :	Demonstrate the use of different emerging frameworks as a front end (angular, node and react JS) as well as backend (Laravel / springboot / hibernate).



**Marwadi**  
University

Bachelor of Technology  
Department of Mechanical Engineering

**Course Outcome**

**Batch**

**(2018-19)**

**M.Tech. in Mechanical Engineering**



Sem	Subject Code	Sr No	Course Out Comes
<b>1</b>	01CA0101	CO1 :	An overview of the modeling of constrained decision making
	01CA0101	CO2 :	Develop a mathematical model for a given problem
	01CA0101	CO3 :	Solve practical problems using suitable computational technique.
	01CA0101	CO4 :	Analyze the sensitivity of a solution to different variables.
	01CA0101	CO5 :	Use and develop computational simulation software for a variety of industrial problems.
	01CA0102	CO1 :	Students will be able to apply laws and theories to design mechanical components subjected to static loading.
	01CA0102	CO2 :	Students will be able to design and analyze mechanical components subjected to dynamic loading.
	01CA0102	CO3 :	For the design and analysis of components, students will be able to incorporate the effect of crack and creep.
	01CA0103	CO2 :	To Understand the Basics of CAD
	01CA0103	CO3 :	To Apply the Knowledge of CAD
	01CA0104	CO1 :	learn various non-conventional machining processes
	01CA0104	CO2 :	To select their respective parameters for machining process
	01CA0104	CO3 :	Students will learn fine finishing processes
	01CA0104	CO4 :	micro-machining and fabrication of micro-devices
	01RM0101	CO0 :	Conduct a quality literature review and find research gap.
	<b>3</b>	01CA0305	CO1 :
01CA0305		CO2 :	To make the students to understands about basic concept of rpt
<b>4</b>	01CA0403	CO1 :	Understanding the basic concept of industry 4.0
	01CA0403	CO2 :	Application of various technology in industry 4.0



	01CA0403	CO3 :	Implementation of various production philosophy in industry 4.0
	01CA0403	CO4 :	Analysis of various processes to implement the industry 4.0



**Marwadi**  
University

Bachelor of Technology  
Department of Mechanical Engineering

**Course Outcome**

**Batch**

**(2019-20)**

**M.Tech. in Mechanical Engineering**





Sem	Subject Code	Sr No	Course Out Comes
<b>1</b>	01CA0101	CO1 :	An overview of the modeling of constrained decision making
	01CA0101	CO2 :	Develop a mathematical model for a given problem
	01CA0101	CO3 :	Solve practical problems using suitable computational technique.
	01CA0101	CO4 :	Analyze the sensitivity of a solution to different variables.
	01CA0101	CO5 :	Use and develop computational simulation software for a variety of industrial problems.
	01CA0102	CO1 :	Students will be able to apply laws and theories to design mechanical components subjected to static loading.
	01CA0102	CO2 :	Students will be able to design and analyze mechanical components subjected to dynamic loading.
	01CA0102	CO3 :	For the design and analysis of components, students will be able to incorporate the effect of crack and creep.
	01CA0103	CO2 :	To Understand the Basics of CAD
	01CA0103	CO3 :	To Apply the Knowledge of CAD
	01CA0104	CO1 :	learn various non-conventional machining processes
	01CA0104	CO2 :	To select their respective parameters for machining process
	01CA0104	CO3 :	Students will learn fine finishing processes
	01CA0104	CO4 :	micro-machining and fabrication of micro-devices
	01RM0101	CO0 :	Conduct a quality literature review and find research gap.
	<b>3</b>	01CA0305	CO1 :
01CA0305		CO2 :	To make the students to understands about basic concept of rpt
<b>4</b>	01CA0403	CO1 :	Understanding the basic concept of industry 4.0
	01CA0403	CO2 :	Application of various technology in industry 4.0



	01CA0403	CO3 :	Implementation of various production philosophy in industry 4.0
	01CA0403	CO4 :	Analysis of various processes to implement the industry 4.0



**Marwadi**  
University

Bachelor of Technology  
Department of Mechanical Engineering

**Course Outcome**

**Batch**

**(2020-21)**

**M.Tech. in Mechanical Engineering**



Sem	Subject Code	Sr No	Course Out Comes
<b>1</b>	01CA0101	CO1 :	An overview of the modeling of constrained decision making
	01CA0101	CO2 :	Develop a mathematical model for a given problem
	01CA0101	CO3 :	Solve practical problems using suitable computational technique.
	01CA0101	CO4 :	Analyze the sensitivity of a solution to different variables.
	01CA0101	CO5 :	Use and develop computational simulation software for a variety of industrial problems.
	01CA0102	CO1 :	Students will be able to apply laws and theories to design mechanical components subjected to static loading.
	01CA0102	CO2 :	Students will be able to design and analyze mechanical components subjected to dynamic loading.
	01CA0102	CO3 :	For the design and analysis of components, students will be able to incorporate the effect of crack and creep.
	01CA0103	CO2 :	To Understand the Basics of CAD
	01CA0103	CO3 :	To Apply the Knowledge of CAD
	01CA0104	CO1 :	learn various non-conventional machining processes
	01CA0104	CO2 :	To select their respective parameters for machining process
	01CA0104	CO3 :	Students will learn fine finishing processes
	01CA0104	CO4 :	micro-machining and fabrication of micro-devices
	01RM0101	CO0 :	Conduct a quality literature review and find research gap.
<b>2</b>	01CA0201	CO1 :	Understand Computer Aided Manufacturing technology, through programming, setup, and operations of various Computer Numerical Control (CNC) machine tools
	01CA0201	CO2 :	Prepare programmes of various CNC machine tools.
	01CA0201	CO3 :	To use feature based modelling for design for manufacture and manufacturing as well
	01CA0202	CO1 :	Understand relevance and importance of the Different Production and operations management techniques and their applications.



	01CA0202	CO2 :	Capable to design, analyse and assess production planning and control systems, including those operating within distributed manufacturing environment.
	01CA0202	CO3 :	Be able to develop simulation of machine shop.
	01CA0202	CO4 :	Gain an overall understanding of computer aided production management.
	01CA0203	CO0 :	-----
	01CA0203	CO1 :	Understand the basics of finite element method for solving various Mechanical Engineering problems.
	01CA0203	CO2 :	Students will be able to apply the knowledge of FEM for 1D stress analysis, modal analysis, heat transfer analysis and flow analysis.
	01CA0203	CO3 :	Students will be able to formulate and solve problems of trusses, beams and frames, students will also be able to use commercial packages for complex problems.
	01CA0203	CO4 :	Students will be able to develop 2-D FE formulations involving triangular, quadrilateral elements and higher order elements.
	01CA0204	CO1 :	Students will be able to understand basic theoretical principles for formulation of optimization models and its solution.
	01CA0204	CO2 :	Students will be able to learn the unified and exact mathematical basis as well as the general principles of various soft computing techniques.
	01CA0204	CO3 :	Students should be able to apply detailed theoretical and practical aspects of intelligent modelling, optimization and control of linear and non-linear systems.
	01CA0205	CO2 :	visualize how the hydraulic/pneumatic circuit will work to accomplish the function
	01CA0205	CO3 :	identify and analyze the functional requirement of a power transmission system for a given application.
<b>3</b>	01CA0305	CO1 :	To remember the basic s of rpt
	01CA0305	CO2 :	To make the students to understands about basic concept of rpt
<b>4</b>	01CA0403	CO1 :	Understanding the basic concept of industry 4.0
	01CA0403	CO2 :	Application of various technology in industry 4.0
	01CA0403	CO3 :	Implementation of various production philosophy in industry 4.0
	01CA0403	CO4 :	Analysis of various processes to implement the industry 4.0



**Marwadi**  
University

Bachelor of Technology  
Department of Mechanical Engineering

**Course Outcome**

**Batch**

**(2021-22)**

**M.Tech. in Mechanical Engineering**



Sem	Subject Code	Sr No	Course Out Comes
<b>1</b>	01CA1101	CO1 :	Students will understand fundamentals of computer graphics and geometrical modelling.
	01CA1101	CO2 :	Students will learn various techniques for surface and solid modeling.
	01CA1101	CO3 :	Students will learn estimation of mass properties of model along with feature-based modeling
	01CA1101	CO4 :	Students will learn assembly modelling and CAD data exchange.
	01CA1102	CO1 :	Design mechanical components subjected to static loading.
	01CA1102	CO2 :	Design and analyze mechanical components subjected to dynamic loading.
	01CA1102	CO3 :	Design and analyze mechanical components subjected to effect of crack and creep.
	01CA1102	CO4 :	Design and analyze mechanical components subjected to effect of fracture.
	01CA1102	CO5 :	Describe the influence of surface failure.
	01CA1103	CO1 :	Students will understand fundamentals of computer graphics and geometrical modeling.
	01CA1103	CO2 :	Students will learn various techniques for surface and solid modeling.
	01CA1103	CO3 :	Students will learn estimation of mass properties of model along with feature-based modeling.
	01CA1103	CO4 :	Students will learn assembly modeling and CAD data exchange.
	01CA1104	CO1 :	Design mechanical components subjected to static loading.
	01CA1104	CO2 :	Design and analyze mechanical components subjected to dynamic loading.
	01CA1104	CO3 :	Design and analyze mechanical components subjected to effect of crack and creep.
	01CA1104	CO4 :	Design and analyze mechanical components subjected to effect of fracture.
	01CA1104	CO5 :	Describe the influence of surface failure.
	01CA1111	CO1 :	An overview of the modeling of constrained decision making



	01CA1111	CO2 :	Develop a mathematical model for a given problem
	01CA1111	CO3 :	Solve practical problems using suitable computational technique.
	01CA1111	CO4 :	Analyze the sensitivity of a solution to different variables
	01CA1111	CO5 :	Use and develop computational simulation software for a variety of industrial problems.
	01CA1121	CO1 :	Students will learn various non-conventional machining processes and will be able to select their respective parameters.
	01CA1121	CO2 :	Students will learn fine finishing processes, micro-machining and fabrication of micro-devices.
	01CA1121	CO3 :	Students will also learn materials processing using lesser.
<b>2</b>	01AU9002	CO1 :	Understand importance values in achieving self-development.
	01AU9002	CO2 :	Inculcate right values, ethics, attitudes, manners and behaviors for life.
	01AU9002	CO3 :	Overall develop a sound personality.
	01AU9002	CO4 :	Imbibe values that translate in character building
	01CA1201	CO1 :	Understand Computer Aided Manufacturing technology, through programming, Setup, and operations of various Computer Numerical Control (CNC) machine tools.
	01CA1201	CO2 :	Prepare programmes of various CNC machine tools.
	01CA1201	CO3 :	To use feature-based modelling for design for manufacture and manufacturing as well.
	01CA1201	CO4 :	Generate CNC program using softwares.
	01CA1202	CO1 :	To understand the concept of finite element method and develop algorithms for analysis of mechanical systems
	01CA1202	CO2 :	Students will be able to apply the knowledge of FEM for 1D stress analysis, modal analysis, heat transfer analysis and flow analysis.
	01CA1202	CO3 :	Students will be able to formulate and solve problems of trusses, beams and frames,
	01CA1202	CO4 :	Students will be able to develop 2-D FE formulations involving triangular, quadrilateral elements and higher order elements
	01CA1202	CO5 :	Students will be able to use FEA packages to solve simple and complex FE problems.





01CA1203	CO1 :	Select and use appropriate cutting tools and tool materials for a given component.
01CA1203	CO2 :	Calculate cutting parameters for various cutting conditions and materials.
01CA1203	CO3 :	Use appropriate G and M codes to manually write programs for CNC lathes and mills.
01CA1203	CO4 :	Set up and operate a variety of CNC lathes and milling machines to produce parts to specifications.
01CA1203	CO5 :	Use CAD/CAM software to generate part geometry and tool paths.
01CA1203	CO6 :	Utilize CNC simulator for trouble shooting in program.
01CA1204	CO1 :	Students will be able to understand the concept of finite element method and develop algorithms for analysis of mechanical systems
01CA1204	CO2 :	Students will be able to apply the knowledge of FEM for 1D stress analysis, modal analysis, heat transfer analysis and flow analysis.
01CA1204	CO3 :	Students will be able to formulate and solve problems of trusses, beams and frames, students will also be able to use commercial packages for complex problems.
01CA1204	CO4 :	Students will be able to develop 2-D FE formulations involving triangular, quadrilateral elements and higher order elements.
01CA1204	CO5 :	Students will be able to use commercial packages to solve simple and complex FE problem
01CA1211	CO1 :	Understand relevance and importance of the Different Production and operations management techniques and their applications
01CA1211	CO2 :	Capable to design, analyze and assess production planning and control systems, including those operating within distributed manufacturing environment.
01CA1211	CO3 :	Be able to develop simulation of machine shop.
01CA1211	CO4 :	Gain an overall understanding of computer aided production management
01CA1221	CO1 :	Understand the basic concept of Optimization Techniques.
01CA1221	CO2 :	Application of optimization techniques in mechanical engineering
01CA1221	CO4 :	Analysis of evolutionary optimization techniques.
01SL1210	CO1 :	To understand the research and its types
01SL1210	CO2 :	To differentiate between journal/proceeding and books and its authenticity



	01SL1210	CO3 :	To identify the quality indices for Journal & Authors
	01SL1210	CO4 :	To differentiate the forms of IPR and its application to the mechanical engineering.
<b>3</b>	01AU9001	CO1 :	Understand the relevance of English in technical paper writing
	01AU9001	CO2 :	Develop wide writing patterns to increase the readability and understanding of papers
	01AU9001	CO3 :	Give inputs in sectional writing and enhancing the quality of reported work
	01AU9001	CO4 :	Understand the relevance of developing a catchy title



**Marwadi**  
University

Bachelor of Technology  
Department of Mechanical Engineering

**Course Outcome**

**Batch**

**(216-17)**

**B.Tech. in Mechanical Engineering**



Sem	Subject Code	Sr No	Course Out Comes
<b>1</b>	01CE0101	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
	01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
	01CE0101	CO3 :	Express and Distinguish various loops in C language (Analyze).
	01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures(Apply)
	01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
	01CE0101	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
	01CI0101	CO1 :	Recognize importance of Civil engineering and its day to day applications.
	01CI0101	CO2 :	Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
	01CI0101	CO3 :	Describe qualitative comparison between different materials and its selection.
	01CI0101	CO4 :	Analyse the water resources, its harvesting and its consumptive use.
	01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
	01CI0101	CO6 :	Acquaint with the various modes of transportation.
	01CR0101	CO1 :	Understands how to use different tools of language in order to communicate effectively.
	01CR0101	CO2 :	Applies appropriate grammatical structures and a wide range of vocabulary in spoken and written discourse.
	01CR0101	CO3 :	Choose appropriate alternatives in personal and professional life.
	01CR0101	CO4 :	Displaying the best of the professional attitude and behavior.
	01GS0101	CO1 :	To Interpret the mechanics of various types of sound waves - what they look like, how they are produced, interact with other sound waves and materials.
	01GS0101	CO2 :	To Describe the basic physical principles and applications of ultrasonic sound.



	01GS0101	CO3 :	To Discuss construction, principle of optical fiber communication. Analyze the structure and properties of lasers to their performance and intended applications .
	01GS0101	CO4 :	To Utilize the concept of superconductivity, magnetic and advanced engineering materials and their behaviors under various system conditions.
	01GS0101	CO5 :	To Explain the need of NDT and its methodologies. Illustrate the properties and mechanisms of nano physics.
	01GS0101	CO6 :	To demonstrate in the laboratory the ability to collect, analyze data and to prepare coherent reports of his or her findings
	01MA0101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
	01MA0101	CO2 :	apply and solve first order differential equations to real life problems
	01MA0101	CO3 :	.Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
	01MA0101	CO4 :	Apply partial differentiation to evaluate equations of tangent plane and normal line for given surface.
	01MA0101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
	01MA0101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
	01ME0101	CO1 :	Understand basic terminologies and fundamentals of mechanical system by correlating science concept.
	01ME0101	CO2 :	Apply the governing laws of mechanical engineering to find solution of different systems.
	01ME0101	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.
	01ME0101	CO4 :	Identify functional characteristics of various mechanisms.
	01ME0101	CO5 :	Analyze the various energy conversion cycles and systems.
<b>2</b>	01EE0103	CO1 :	Recognize importance of electrical energy and its day to day applications. (Understand)
	01EE0103	CO2 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions. (Apply)
	01EE0103	CO3 :	Analyse and solve DC Circuits, AC Single phase and magnetic circuits. (Analyse)
	01EE0103	CO4 :	Explain the need of batteries, its characteristics and charging methods. (Remember/Knowledge)
	01EE0103	CO5 :	Perceive the detail understanding of construction, operation and applications of various components like Diode, BJT and Op-Amp. (Understand)



01EE0103	CO6 :	Recognize basic electronic devices used in various circuits. (Understand)
01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
01EN0101	CO2 :	Know the importance of natural resources for the sustainable development of life.
01EN0101	CO3 :	Understand the effect of growing population on the Environment.
01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
01MA0151	CO1 :	Explain the linear dependence of vectors of different vector space.
01MA0151	CO2 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.
01MA0151	CO3 :	Understand the role of multiple integral in finding volume of three dimensional objects, finding area between two curves, finding moment of inertia etc.
01MA0151	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
01MA0151	CO5 :	Check the convergence and divergence of various functions which are expandable in infinite terms.
01MA0151	CO6 :	Gain the fundamental knowledge about special function like Beta and Gamma and its applications.
01ME0102	CO1 :	Interpret engineering drawings using fundamental technical mathematics.
01ME0102	CO2 :	Comprehend the theory of projection.
01ME0102	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
01ME0102	CO4 :	To improve their technical communication skill in the form of communicative drawings
01ME0102	CO5 :	Construct basic and intermediate geometry.
01ME0102	CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.
01ME0104	CO1 :	Learn about Application of hand tools and power tools.
01ME0104	CO2 :	Learn about various operations of machine tools.



	01ME0104	CO3 :	Selection of processes and steps for specific operation
	01ME0104	CO4 :	Knowledge and awareness about various safety related operation
	01SL0101	CO1 :	After completion of this course, student will be able to comprehend texts based on science and technology.
	01SL0101	CO2 :	After completion of this course, student will be able to develop the ability to interpret informative and analytical texts.
	01SL0101	CO3 :	After completion of this course, student will be able to evolve an understanding of components of academic writing.
	01SL0101	CO4 :	After completion of this course, student will be able to explain technical concepts in written form.
	01SL0101	CO5 :	After completion of this course, student will be able to compose written texts for the purposes of academic writing.
<b>3</b>	01CI0301	CO1 :	To apply fundamental principles of mechanics and equilibrium to get responses of rigid and deformable bodies
	01CI0301	CO2 :	To identify centroid, Center of Gravity, Center of Mass and moment of inertia of a simple and complex geometrical Shapes.
	01CI0301	CO3 :	To determine different types of stresses and strains developed in the Member subjected to axial, bending, shear, torsion & thermal loads.
	01CI0301	CO4 :	To analyze the determinate beam and draw its shear force and bending moment diagram.
	01CR0301	CO1 :	Understands how to use different tools of language in order to communicate effectively.
	01CR0301	CO2 :	Applies appropriate grammatical structures and wide range of vocabulary in spoken and written discourse in formal context.
	01CR0301	CO3 :	Choose appropriate alternatives in order to cope with personal and professional life.
	01CR0301	CO4 :	Displaying the best of the professional attitude and behavior.
	01MA0201	CO1 :	Expand Various functions in terms of sine and cosine functions
	01MA0201	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations
	01MA0201	CO3 :	Apply Laplace transform & series solution to solve differential equations.
	01MA0201	CO4 :	Apply the knowledge of differential equations and its solutions to evaluate engineering problems
	01ME0301	CO1 :	To identify the fundamentals of Fluid mechanics and define the terminology



	01ME0301	CO2 :	To distinguish between the types of fluid flow
	01ME0301	CO3 :	Apply the basic equation of fluid statics on the plane, curved surfaces, manometers
	01ME0301	CO4 :	Application of continuity and momentum equation, Bernoulli equation
	01ME0301	CO5 :	Apply principles of dimensional analysis and similitude to simple problems and use of dimensionless parameters
	01ME0301	CO6 :	Ability to analyze fluid flow problems with the application of momentum and energy equation and analyze pipe flow problems
	01ME0302	CO1 :	Identify the functional characteristics of various machine elements
	01ME0302	CO2 :	Construct specified motion profiles for cam and follower.
	01ME0302	CO3 :	Analyze and synthesize planar mechanisms for the motion parameters.
	01ME0302	CO4 :	Evaluate gear tooth geometry and analyze the motion of gear trains.
	01ME0303	CO1 :	Select the machine(tool) according to requirements.
	01ME0303	CO2 :	Able to Compare among the different machine tools.
	01ME0303	CO3 :	Develop the sequence of machining operation to produce the end product.
	01ME0303	CO4 :	Analyze any conventional machining operations.
<b>4</b>	01MA0271	CO1 :	Recognize the error in the number generated by the solution
	01MA0271	CO2 :	Compute solution of algebraic and transcendental equation by numerical methods like Bisection method and Newton Rapshon method
	01MA0271	CO3 :	Apply method of interpolation and extrapolation for prediction
	01MA0271	CO4 :	Use numerical methods and tools in the engineering problem solving process.
	01MA0271	CO5 :	Student able to apply numerical integration in engineering problems
	01MA0271	CO6 :	Student able to apply ordinary differential equation in engineering problems
	01ME0401	CO1 :	Understand terminologies used in machine design.





01ME0401	CO2 :	Use different theories to design members as beam and column.
01ME0401	CO3 :	Apply different theories of failures to design components subjected to combined loading.
01ME0401	CO4 :	Select and design various types of temporary and permanent joints such as riveted joint, welded joint, screw joint and power screw.
01ME0401	CO5 :	Students will be able to scrutinize different static loading conditions such as simple and combined loading for a given machine element.
01ME0401	CO6 :	Construct Part and assembly drawings by using design standards and symbols in 2D drafting software.
01ME0402	CO1 :	Application of manufacturing process for making metallic and nonmetallic components
01ME0402	CO2 :	Identify and optimize parameters for manufacturing process.
01ME0402	CO3 :	Design gating system for casting components.
01ME0402	CO4 :	Application of simulation software for manufacturing processes.
01ME0402	CO5 :	Develop the sequence of operations to produce the end product.
01ME0402	CO6 :	Judge the limitations and scope of process to perform variety of functions.
01ME0403	CO1 :	Enhance the technical knowledge on Engineering materials & its applications.
01ME0403	CO2 :	Establish important relationships between internal structure, properties and performance of materials during processing and use.
01ME0403	CO3 :	Design the alloy system based on their knowledge of phase diagrams and metal characteristics.
01ME0403	CO4 :	Understand different non-destructive testing methods
01ME0403	CO5 :	Know the various heat treatment processes for steels.
01ME0403	CO6 :	Apply the knowledge of Heat treatment process for emphasizing relation between micro-structure and mechanical properties.
01ME0404	CO1 :	To elucidate the basic concepts of thermodynamics
01ME0404	CO2 :	To simplify properties of Ideal and Real Gases
01ME0404	CO3 :	To express and utilize first law of thermodynamics for closed and open systems



	01ME0404	CO4 :	To determine the feasibility of thermodynamic cycles and processes using second law of thermodynamics
	01ME0404	CO5 :	To make the use of concept of entropy and exergy to different thermodynamic processes and cycles
	01ME0404	CO6 :	To analyze different gas power, vapor power and refrigeration cycles
<b>5</b>	01CR0501	CO1 :	Contrast and understand short pieces of business correspondence reports or proposals. (Understanding)
	01CR0501	CO2 :	Read and Categorize the extracts from business publications. Ask for the information required. (Analyzing)
	01CR0501	CO3 :	Listen to, understand and contribute to discussions in meetings. (Remembering)
	01CR0501	CO4 :	Prepare the presentation on a familiar topic. (Applying)
	01ME0501	CO1 :	Identify effect of gyroscopic couples
	01ME0501	CO2 :	Design governor and flywheel for engines and machines
	01ME0501	CO3 :	Calculate the friction and inertia for different components.
	01ME0501	CO4 :	Analyse the effect due to the static and dynamic forces on machines
	01ME0502	CO1 :	Understand the operation and use of different hydraulic machines like hydraulic turbine, pumps, compressors, etc...
	01ME0502	CO2 :	Apply their knowledge to calculate various performance parameters related to fluid machines.
	01ME0502	CO3 :	Use characteristic curves to forecast the performance of fluid machines for the different operating conditions.
	01ME0502	CO4 :	Analyse the selection of fluid machines.
	01ME0502	CO5 :	Implement laws of fluid to determine basic dimensions of hydraulic machines depending on various field applications.
	01ME0503	CO1 :	Apply the factors to be considered while designing a machine component.
	01ME0503	CO2 :	Apply mathematical knowledge to design mechanical spring.
	01ME0503	CO3 :	Compute the forces and torques involved in Belt drive, Rope drive and Chain drive.
	01ME0503	CO4 :	Analyze components subjected to fluctuating loads.



01ME0503	CO5 :	Analyze various stresses induced in pressure vessel.
01ME0504	CO1 :	Understand the basic concept of Metrology & to select instrument for particular measurement. Describing the calibration of instrument
01ME0504	CO2 :	Demonstration of various instrument for hands on experience.
01ME0504	CO3 :	Application of various measuring instrument in industry & day to day life
01ME0504	CO4 :	Analysing the error in measurement & measuring instruments
01ME0504	CO5 :	Discriminate the various methods of measurement
01ME0504	CO6 :	Describe the use of advanced measuring instrument
01ME0505	CO1 :	Understand basics of power plant including thermodynamic cycles, site selection criteria and modern power plant concept.
01ME0505	CO2 :	Understand working of different types of steam generators and different material handling system for power plant.
01ME0505	CO3 :	Analyze functioning of condensers and cooling systems.
01ME0505	CO4 :	Analyze working and performance parameters of different draught systems.
01ME0505	CO5 :	Understand various types of feed water treatment.
01ME0505	CO6 :	Understand nuclear power plants with basic physics and new concepts.
01ME0507	CO1 :	Choose proper manufacturing system.
01ME0507	CO2 :	Use different parameters of design
01ME0507	CO3 :	Analyze different process of material selection
01ME0507	CO4 :	Design for different parameters in Manufacturing and assembling.
01ME0508	CO1 :	Understand the problem in the existing process.
01ME0508	CO2 :	Collect the large number of data/ information for the product
01ME0508	CO3 :	Depth analyze of the products and extraction of real time data



	01ME0508	CO4 :	Understand the principles behind the design of the product, ways to redesign and improve the performance of the system.
<b>6</b>	01ME0601	CO1 :	Apply fundamental of Balancing to various rotating and reciprocating Mechanical system
	01ME0601	CO2 :	Apply fundamental of vibration to various mechanical system to find frequency and measure vibration
	01ME0601	CO3 :	Analysis the effect of unbalance force on rotating and reciprocating mechanical system.
	01ME0601	CO4 :	Analysis the vibration occurring in various mechanical system and effect of force and damping on vibration system
	01ME0602	CO1 :	Distinguish the modes and phenomenological origin of laws for the different modes of heat and mass transfer
	01ME0602	CO2 :	Compute heat conduction in a steady and transient state for various geometrics
	01ME0602	CO3 :	Predict empirical correlation for analyzing free and forced convection problem
	01ME0602	CO4 :	Appraise the performance of heat exchangers by using various design method
	01ME0602	CO5 :	Derive radiation heat exchange between black surface, diffuse and gray enclosure
	01ME0603	CO1 :	Interpreting the Design procedure of different types of Machine elements.
	01ME0603	CO2 :	Identification of the appropriate bearing for the given application.
	01ME0603	CO3 :	Examine the dimensions of various I.C.Engine components based on the design equations.
	01ME0603	CO4 :	Estimate the gear parameters for various loading conditions.
	01ME0604	CO1 :	Describe Characteristics & applications of Operation Research and understand basic terms of scientific method of OR.
	01ME0604	CO2 :	Formulate real world problems as a mathematical programming model and solve Linear Programming problems.
	01ME0604	CO3 :	Formulate and solve transportation and work/job assignments problems.
	01ME0604	CO4 :	Understand policies for the replacement of machines/components in the industry.
	01ME0604	CO5 :	Solve problems related to CPM and PERT for project management techniques.
	01ME0604	CO6 :	Solve Queuing and Inventory problems related to practical applications.



	01ME0605	CO1 :	Identify different types of internal combustion engines, its components and their applications.
	01ME0605	CO2 :	Evaluate the performance parameters of the engine and its significance.
	01ME0605	CO3 :	Analyze fuel supply systems, ignition and governing systems of IC engines.
	01ME0605	CO4 :	Apply various methods of power enhancement such as supercharger and turbocharger.
	01ME0605	CO5 :	Analyze economic and environmental effects related to emissions from different engines.
	01ME0605	CO6 :	To evaluate the performance of IC engines based on the different test on SI and CI engines.
	01ME0607	CO1 :	Application of advanced manufacturing processes
	01ME0607	CO2 :	Identify the best manufacturing processes for product requirements
	01ME0607	CO3 :	Analyzing the process parameter for a quality product
	01ME0607	CO4 :	Use of advanced technology for development of manufacturing processes
	01ME0607	CO5 :	Understanding the basic concept of advanced machining processes
	01ME0610	CO1 :	Understand the importance of Design Engineering.
	01ME0610	CO2 :	Identify various Design Engineering approaches.
	01ME0610	CO3 :	Apply various methodologies to design the product and in testing the product.
	01ME0610	CO4 :	Understand various Project Management Processes.
	01ME0610	CO5 :	Demonstrate effective project execution and control techniques that result in successful projects.
<b>7</b>	01ME0701	CO2 :	Apply the knowledge of FEM for 1D stress analysis, heat transfer analysis and fluid flow analysis
	01ME0701	CO3 :	Formulate and solve problems of trusses, beams and frames.
	01ME0701	CO4 :	Solve two dimensional FE formulations involving triangular, quadrilateral elements and higher order elements.
	01ME0701	CO5 :	Prepare algorithms and write Finite Element code for solving simple design problems and understand the use of commercial packages for complex problems.



01ME0702	CO1 :	Identify a topic which are related to need of industry or society.
01ME0702	CO2 :	Review literature to identify gaps and define objectives & scope of the work.
01ME0702	CO3 :	Reorganize the procedures with a concern for society, environment and ethics.
01ME0702	CO4 :	Develop conceptual and engineering design of any mechanical components and also to fabricate them using different manufacturing tools.
01ME0703	CO1 :	To calculation of pattern allowances applicable for different material.
01ME0703	CO2 :	To choose pattern making using different methods.
01ME0703	CO3 :	To Analyze moulding process for metal casting.
01ME0703	CO4 :	To Analyze filling and feeding system for metal casting
01ME0721	CO1 :	Develop understanding of various types of production systems
01ME0721	CO2 :	Identify the factors affecting the selection of plant location and plant layout to construct the optimum layout within the plant with the use of computerized relationship of facilities/resources.
01ME0721	CO3 :	Solve MRP-I and MRP-II problems to maintain the lot size according to the demand of products.
01ME0721	CO4 :	Organize production facilities/resources using scheduling techniques and line of balance.
01ME0721	CO5 :	Make use of CAPP to manage shop floor data considering database structure and network across the shop floor.
01ME0721	CO6 :	Examine modern approaches in manufacturing for better shop floor productivity and to optimize it using simulation packages.
01ME0722	CO1 :	Understanding the basic concept of Data Mining
01ME0722	CO2 :	Apply the data mining in production system
01ME0722	CO3 :	Identify the best tool of data mining for production system
01ME0722	CO4 :	Solve the issue of production system using the various data mining tools
01ME0722	CO5 :	Use of Modern data mining tool in production
01ME0731	CO1 :	Gathering basic concepts and knowledge of Refrigeration and Air-Conditioning system.



	01ME0731	CO2 :	Analyze performance parameters of Air-refrigeration system, Vapour Compression & Vapour Absorption Refrigeration by using various refrigerants.
	01ME0731	CO3 :	Examine different terminology of psychrometry and psychrometric processes for human comfort with load calculation sheet
	01ME0731	CO4 :	Predict the duct design method and air distribution system for analyzing duct and piping system
	01ME0731	CO5 :	Categorize refrigeration and air-conditioning system components based on application
	01ME0732	CO1 :	Illustrate the principle of energy conversion from alternate sources like solar, wind, ocean, geothermal, ocean, biomass
	01ME0732	CO2 :	Design & Analyse various renewable energy system.
	01ME0732	CO3 :	Economic analysis RE system and acquire knowledge about modern technologies
	01ME0732	CO4 :	Examine the need of renewable energy sources, future scope, advantages, disadvantages and comparison of various renewable sources
<b>8</b>	01ME0801	CO1 :	Understand the basic concept of Production Technology.
	01ME0801	CO2 :	Design of Jig and fixture for metal cutting.
	01ME0801	CO3 :	Apply the knowledge of sheet metal operations in manufacturing industries.
	01ME0801	CO4 :	Analyze the machining processes.
	01ME0802	CO1 :	Identify a topic which are related to need of industry or society.
	01ME0802	CO2 :	Review literature to identify gaps and define objectives & scope of the work.
	01ME0802	CO3 :	Reorganize the procedures with a concern for society, environment and ethics.
	01ME0802	CO4 :	Develop conceptual and engineering design of any mechanical components and also to fabricate them using different manufacturing tools.
	01ME0803	CO1 :	Understanding the basic concept of various destructive, non destructive and metallurgical testing in casting
	01ME0803	CO2 :	Application of various testing method in casting
	01ME0803	CO3 :	Analysis of various testing method used in casting
	01ME0803	CO4 :	Simulation of different components using AutoCAST.



01ME0803	CO5 :	Design of circuits using Arduino and Data Taker.
01ME0821	CO1 :	Apply modeling, manufacturing concepts and management principles.
01ME0821	CO2 :	Classify and compare different manufacturing processes and systems.
01ME0821	CO3 :	Develop solid models and part program for manufacturing of different machine components.
01ME0821	CO4 :	Analyze the behavior of manufacturing system using simulation.
01ME0822	CO1 :	Understanding the basic concept of industry 4.0
01ME0822	CO2 :	Application of various technology in industry 4.0
01ME0822	CO3 :	Implementation of various production philosophy in industry 4.0
01ME0822	CO4 :	Analysis of various processes to implement the industry 4.0
01ME0831	CO1 :	Distinguish type of nozzle based on mach number
01ME0831	CO2 :	Analyze the performance of steam nozzle
01ME0831	CO3 :	Evaluate the performance of steam turbine
01ME0831	CO4 :	Analyze thermodynamic cycles of gas turbine power plant
01ME0831	CO5 :	Analyze the working of jet propulsion technology
01ME0832	CO1 :	To develop perception of major theories, approaches and methodologies used in CFD.
01ME0832	CO2 :	To apply differential equations to Fluid Dynamic problems.
01ME0832	CO3 :	To gain the elementary knowledge of finite elements method for flow and heat transfer problems.
01ME0832	CO4 :	To analyse the numerical simulation to solve major engineering design problems involving fluid flow and heat transfer.
01ME0832	CO5 :	To build up the skills in the implementation of CFD methods (e.g. boundary conditions.) in actual engineering using commercial CFD codes.





**Marwadi**  
University

Bachelor of Technology  
Department of Mechanical Engineering

**Course Outcome**

**Batch**

**(217-18)**

**B.Tech. in Mechanical Engineering**



Sem	Subject Code	Sr No	Course Out Comes
1	01CE0101	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
	01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
	01CE0101	CO3 :	Express and Distinguish various loops in C language (Analyze).
	01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures(Apply)
	01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
	01CE0101	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
	01CI0101	CO1 :	Recognize importance of Civil engineering and its day to day applications.
	01CI0101	CO2 :	Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
	01CI0101	CO3 :	Describe qualitative comparison between different materials and its selection.
	01CI0101	CO4 :	Analyse the water resources, its harvesting and its consumptive use.
	01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
	01CI0101	CO6 :	Acquaint with the various modes of transportation.
	01CR0101	CO1 :	Understands how to use different tools of language in order to communicate effectively.
	01CR0101	CO2 :	Applies appropriate grammatical structures and a wide range of vocabulary in spoken and written discourse.
	01CR0101	CO3 :	Choose appropriate alternatives in personal and professional life.
	01CR0101	CO4 :	Displaying the best of the professional attitude and behavior.
	01GS0101	CO1 :	To Interpret the mechanics of various types of sound waves -what they look like, how they are produced, interact with other sound waves and materials.
	01GS0101	CO2 :	To Describe the basic physical principles and applications of ultrasonic sound.
	01GS0101	CO3 :	To Discuss construction, principle of optical fiber communication. Analyze the structure and properties of lasers to their performance and intended applications .



	01GS0101	CO4 :	To Utilize the concept of superconductivity, magnetic and advanced engineering materials and their behaviors under various system conditions.
	01GS0101	CO5 :	To Explain the need of NDT and its methodologies. Illustrate the properties and mechanisms of nano physics.
	01GS0101	CO6 :	To demonstrate in the laboratory the ability to collect, analyze data and to prepare coherent reports of his or her findings
	01MA0101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
	01MA0101	CO2 :	apply and solve first order differential equations to real life problems
	01MA0101	CO3 :	.Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
	01MA0101	CO4 :	Apply partial differentiation to evaluate equations of tangent plane and normal line for given surface.
	01MA0101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
	01MA0101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
	01ME0101	CO1 :	Understand basic terminologies and fundamentals of mechanical system by correlating science concept.
	01ME0101	CO2 :	Apply the governing laws of mechanical engineering to find solution of different systems.
	01ME0101	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.
	01ME0101	CO4 :	Identify functional characteristics of various mechanisms.
	01ME0101	CO5 :	Analyze the various energy conversion cycles and systems.
<b>2</b>	01EE0103	CO1 :	Recognize importance of electrical energy and its day to day applications. (Understand)
	01EE0103	CO2 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions. (Apply)
	01EE0103	CO3 :	Analyse and solve DC Circuits, AC Single phase and magnetic circuits. (Analyse)
	01EE0103	CO4 :	Explain the need of batteries, its characteristics and charging methods. (Remember/Knowledge)
	01EE0103	CO5 :	Perceive the detail understanding of construction, operation and applications of various components like Diode, BJT and Op-Amp. (Understand)
	01EE0103	CO6 :	Recognize basic electronic devices used in various circuits. (Understand)



	01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
	01EN0101	CO2 :	Know the importance of natural resources for the sustainable development of life.
	01EN0101	CO3 :	Understand the effect of growing population on the Environment.
	01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
	01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
	01MA0151	CO1 :	Explain the linear dependence of vectors of different vector space.
	01MA0151	CO2 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.
	01MA0151	CO3 :	Understand the role of multiple integral in finding volume of three dimensional objects, finding area between to two curves, finding moment of inertia etc.
	01MA0151	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
	01MA0151	CO5 :	Check the convergence and divergence of various functions which are expandable in infinite terms.
	01MA0151	CO6 :	Gain the fundamental knowledge about special function like Beta and Gamma and its applications.
	01ME0102	CO1 :	Interpret engineering drawings using fundamental technical mathematics.
	01ME0102	CO2 :	Comprehend the theory of projection.
	01ME0102	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
	01ME0102	CO4 :	To improve their technical communication skill in the form of communicative drawings
	01ME0102	CO5 :	Construct basic and intermediate geometry.
	01ME0102	CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.
	01ME0104	CO1 :	Learn about Application of hand tools and power tools.
	01ME0104	CO2 :	Learn about various operations of machine tools.
	01ME0104	CO3 :	Selection of processes and steps for specific operation



	01ME0104	CO4 :	Knowledge and awareness about various safety related operation
	01SL0102	CO1 :	To enhance reading skills for academic purposes
	01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes
	01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
	01SL0102	CO4 :	To express their ideas in formal, academic written form
	01SL0103	CO1 :	Develop speaking competence for academic purpose
	01SL0103	CO2 :	Speak on a given topic in the context of technology
	01SL0103	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements
	01SL0103	CO4 :	Enhance the ability to make a presentation on a given topic
<b>3</b>	01CI0301	CO1 :	To apply fundamental principles of mechanics and equilibrium to get responses of rigid and deformable bodies
	01CI0301	CO2 :	To identify centroid, Center of Gravity, Center of Mass and moment of inertia of a simple and complex geometrical Shapes.
	01CI0301	CO3 :	To determine different types of stresses and strains developed in the Member subjected to axial, bending, shear, torsion & thermal loads.
	01CI0301	CO4 :	To analyze the determinate beam and draw its shear force and bending moment diagram.
	01CR0302	CO1 :	Express the basics of human values.
	01CR0302	CO2 :	Articulate human values and grow as responsible human beings in the society
	01CR0302	CO3 :	Develop ethical conduct and deliver their professional duties.
	01CR0302	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level
	01MA0301	CO1 :	Expand Various functions in terms of sine and cosine functions
	01MA0301	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations
	01MA0301	CO3 :	Apply Laplace transform & series solution to solve differential equations.



	01MA0301	CO4 :	Apply the knowledge of differential equations and its solutions to evaluate engineering problems
	01ME0302	CO1 :	Identify the functional characteristics of various machine elements
	01ME0302	CO2 :	Construct specified motion profiles for cam and follower.
	01ME0302	CO3 :	Analyze and synthesize planar mechanisms for the motion parameters.
	01ME0302	CO4 :	Evaluate gear tooth geometry and analyze the motion of gear trains.
	01ME0304	CO1 :	Understand the importance of Design Thinking.
	01ME0304	CO2 :	Evaluate the quality of your information and your emotions; keep thinking straight.
	01ME0304	CO3 :	Identify skills and personality traits of successful problem solving.
	01ME0304	CO4 :	Apply standard problem-solving heuristics to aid in problem solving.
	01ME0304	CO5 :	Apply problem-solving techniques to programming activities.
	01ME0304	CO6 :	Formulate and successfully communicate the solutions to problems.
	01ME1301	CO1 :	To identify the fundamentals of Fluid mechanics and define the terminology.
	01ME1301	CO2 :	To distinguish between the types of fluid flow.
	01ME1301	CO3 :	Apply the basic equation of fluid statics on the plane, curved surfaces, manometers,
	01ME1301	CO4 :	Application of continuity and momentum equation, Bernoulli equation .
	01ME1301	CO5 :	Apply principles of dimensional analysis and similitude to simple problems and use of dimensionless parameters.
	01ME1301	CO6 :	Ability to analyze fluid flow problems with the application of momentum and energy equation and analyze pipe flow problems.
	01ME1303	CO1 :	Select the machine(tool) according to requirements.
	01ME1303	CO2 :	Able to Compare among the different machine tools.
	01ME1303	CO3 :	Develop the sequence of machining operation to produce the end product.



	01ME1303	CO4 :	Analyze any conventional machining operations.
4	01MA0271	CO1 :	Recognize the error in the number generated by the solution
	01MA0271	CO2 :	Compute solution of algebraic and transcendental equation by numerical methods like Bisection method and Newton Rapshon method
	01MA0271	CO3 :	Apply method of interpolation and extrapolation for prediction
	01MA0271	CO4 :	Use numerical methods and tools in the engineering problem solving process.
	01MA0271	CO5 :	Student able to apply numerical integration in engineering problems
	01MA0271	CO6 :	Student able to apply ordinary differential equation in engineering problems
	01ME0401	CO1 :	Understand terminologies used in machine design.
	01ME0401	CO2 :	Use different theories to design members as beam and column.
	01ME0401	CO3 :	Apply different theories of failures to design components subjected to combined loading.
	01ME0401	CO4 :	Select and design various types of temporary and permanent joints such as riveted joint, welded joint, screw joint and power screw.
	01ME0401	CO5 :	Students will be able to scrutinize different static loading conditions such as simple and combined loading for a given machine element.
	01ME0401	CO6 :	Construct Part and assembly drawings by using design standards and symbols in 2D drafting software.
	01ME0404	CO1 :	To elucidate the basic concepts of thermodynamics
	01ME0404	CO2 :	To simplify properties of Ideal and Real Gases
	01ME0404	CO3 :	To express and utilize first law of thermodynamics for closed and open systems
	01ME0404	CO4 :	To determine the feasibility of thermodynamic cycles and processes using second law of thermodynamics
	01ME0404	CO5 :	To make the use of concept of entropy and exergy to different thermodynamic processes and cycles
	01ME0404	CO6 :	To analyze different gas power, vapor power and refrigeration cycles
	01ME0405	CO1 :	Understand the Human Centric approach for design.



	01ME0405	CO2 :	Understand significance of the empathy and solution based on empathy
	01ME0405	CO3 :	Importance of design thinking when addressing social change
	01ME0405	CO4 :	Generate the innovative ideas and will convert in new solutions.
	01ME0405	CO5 :	Build a possible prototype solutions
	01ME1402	CO1 :	Application of manufacturing process for making metallic and nonmetallic components.
	01ME1402	CO2 :	Identify and optimize parameters for manufacturing process.
	01ME1402	CO3 :	Design gating system for casting components.
	01ME1402	CO4 :	Application of simulation software for manufacturing processes.
	01ME1403	CO1 :	Enhance the technical knowledge on Engineering materials & its applications.
	01ME1403	CO2 :	Establish important relationships between internal structure, properties and performance of materials during processing and use.
	01ME1403	CO3 :	Design the alloy system based on their knowledge of phase diagrams and metal characteristics.
	01ME1403	CO4 :	Understand different non-destructive testing methods.
	01ME1403	CO5 :	Know the various heat treatment processes for steels.
	01ME1403	CO6 :	Apply the knowledge of Heat treatment process for emphasizing relation between microstructure and mechanical properties.
	<b>5</b>	01CR0501	CO1 :
01CR0501		CO2 :	Read and Categorize the extracts from business publications. Ask for the information required. (Analyzing)
01CR0501		CO3 :	Listen to, understand and contribute to discussions in meetings. (Remembering)
01CR0501		CO4 :	Prepare the presentation on a familiar topic. (Applying)
01ME0501		CO1 :	Identify effect of gyroscopic couples
01ME0501		CO2 :	Design governor and flywheel for engines and machines





01ME0501	CO3 :	Calculate the friction and inertia for different components.
01ME0501	CO4 :	Analyse the effect due to the static and dynamic forces on machines
01ME0502	CO1 :	Understand the operation and use of different hydraulic machines like hydraulic turbine, pumps, compressors, etc...
01ME0502	CO2 :	Apply their knowledge to calculate various performance parameters related to fluid machines.
01ME0502	CO3 :	Use characteristic curves to forecast the performance of fluid machines for the different operating conditions.
01ME0502	CO4 :	Analyse the selection of fluid machines.
01ME0502	CO5 :	Implement laws of fluid to determine basic dimensions of hydraulic machines depending on various field applications.
01ME0503	CO1 :	Apply the factors to be considered while designing a machine component.
01ME0503	CO2 :	Apply mathematical knowledge to design mechanical spring.
01ME0503	CO3 :	Compute the forces and torques involved in Belt drive, Rope drive and Chain drive.
01ME0503	CO4 :	Analyze components subjected to fluctuating loads.
01ME0503	CO5 :	Analyze various stresses induced in pressure vessel.
01ME0504	CO1 :	Understand the basic concept of Metrology & to select instrument for particular measurement. Describing the calibration of instrument
01ME0504	CO2 :	Demonstration of various instrument for hands on experience.
01ME0504	CO3 :	Application of various measuring instrument in industry & day to day life
01ME0504	CO4 :	Analysing the error in measurement & measuring instruments
01ME0504	CO5 :	Discriminate the various methods of measurement
01ME0504	CO6 :	Describe the use of advanced measuring instrument
01ME0506	CO1 :	Make use of fundamentals of computer graphics to generate basic entities using algorithms.
01ME0506	CO2 :	Apply the knowledge of parametric equations to generate curves and surfaces.



	01ME0506	CO3 :	Organize the basic geometric transformations to perform the desired operation.
	01ME0506	CO4 :	Select the concept of clipping for various geometries.
	01ME0507	CO1 :	Choose proper manufacturing system.
	01ME0507	CO2 :	Use different parameters of design
	01ME0507	CO3 :	Analyze different process of material selection
	01ME0507	CO4 :	Design for different parameters in Manufacturing and assembling.
	01ME0508	CO1 :	Understand the problem in the existing process.
	01ME0508	CO2 :	Collect the large number of data/ information for the product
	01ME0508	CO3 :	Depth analyze of the products and extraction of real time data
	01ME0508	CO4 :	Understand the principles behind the design of the product, ways to redesign and improve the performance of the system.
<b>6</b>	01ME0601	CO1 :	Apply fundamental of Balancing to various rotating and reciprocating Mechanical system
	01ME0601	CO2 :	Apply fundamental of vibration to various mechanical system to find frequency and measure vibration
	01ME0601	CO3 :	Analysis the effect of unbalance force on rotating and reciprocating mechanical system.
	01ME0601	CO4 :	Analysis the vibration occurring in various mechanical system and effect of force and damping on vibration system
	01ME0602	CO1 :	Distinguish the modes and phenomenological origin of laws for the different modes of heat and mass transfer
	01ME0602	CO2 :	Compute heat conduction in a steady and transient state for various geometrics
	01ME0602	CO3 :	Predict empirical correlation for analyzing free and forced convection problem
	01ME0602	CO4 :	Appraise the performance of heat exchangers by using various design method
	01ME0602	CO5 :	Derive radiation heat exchange between black surface, diffuse and gray enclosure
	01ME0603	CO1 :	Interpreting the Design procedure of different types of Machine elements.



	01ME0603	CO2 :	Identification of the appropriate bearing for the given application.
	01ME0603	CO3 :	Examine the dimensions of various I.C.Engine components based on the design equations.
	01ME0603	CO4 :	Estimate the gear parameters for various loading conditions.
	01ME0604	CO1 :	Describe Characteristics & applications of Operation Research and understand basic terms of scientific method of OR.
	01ME0604	CO2 :	Formulate real world problems as a mathematical programming model and solve Linear Programming problems.
	01ME0604	CO3 :	Formulate and solve transportation and work/job assignments problems.
	01ME0604	CO4 :	Understand policies for the replacement of machines/components in the industry.
	01ME0604	CO5 :	Solve problems related to CPM and PERT for project management techniques.
	01ME0604	CO6 :	Solve Queuing and Inventory problems related to practical applications.
	01ME0606	CO1 :	Understand the basic Fundamentals of Material Handling Equipment.
	01ME0606	CO2 :	Design various hoisting elements like, chains, Hemp and wire ropes, Pulley systems, Sprockets & drums, forged hooks and eye hooks and Girders.
	01ME0606	CO3 :	Design a Conveyors and Selection based on the Application.
	01ME0606	CO4 :	Design of Bucket and Cage Elevator.
	01ME0607	CO1 :	Application of advanced manufacturing processes
	01ME0607	CO2 :	Identify the best manufacturing processes for product requirements
	01ME0607	CO3 :	Analyzing the process parameter for a quality product
	01ME0607	CO4 :	Use of advanced technology for development of manufacturing processes
	01ME0607	CO5 :	Understanding the basic concept of advanced machining processes
	01ME0610	CO1 :	Understand the importance of Design Engineering.
	01ME0610	CO2 :	Identify various Design Engineering approaches.



	01ME0610	CO3 :	Apply various methodologies to design the product and in testing the product.
	01ME0610	CO4 :	Understand various Project Management Processes.
	01ME0610	CO5 :	Demonstrate effective project execution and control techniques that result in successful projects.
<b>7</b>	01ME0701	CO2 :	Apply the knowledge of FEM for 1D stress analysis, heat transfer analysis and fluid flow analysis
	01ME0701	CO3 :	Formulate and solve problems of trusses, beams and frames.
	01ME0701	CO4 :	Solve two dimensional FE formulations involving triangular, quadrilateral elements and higher order elements.
	01ME0701	CO5 :	Prepare algorithms and write Finite Element code for solving simple design problems and understand the use of commercial packages for complex problems.
	01ME0702	CO1 :	Identify a topic which are related to need of industry or society.
	01ME0702	CO2 :	Review literature to identify gaps and define objectives & scope of the work.
	01ME0702	CO3 :	Reorganize the procedures with a concern for society, environment and ethics.
	01ME0702	CO4 :	Develop conceptual and engineering design of any mechanical components and also to fabricate them using different manufacturing tools.
	01ME0703	CO1 :	To calculation of pattern allowances applicable for different material.
	01ME0703	CO2 :	To choose pattern making using different methods.
	01ME0703	CO3 :	To Analyze moulding process for metal casting.
	01ME0703	CO4 :	To Analyze filling and feeding system for metal casting
	01ME0711	CO1 :	Apply different theories of failures to design mechanical components subjected to Static loading.
	01ME0711	CO2 :	To design and analyze mechanical components subjected to dynamic loading.
	01ME0711	CO3 :	To apply Fracture mechanics & Creep theories for the design of mechanical components
	01ME0711	CO4 :	To design a Mechanical component subjected to surface stresses and analyze their failure
	01ME0721	CO1 :	Develop understanding of various types of production systems



	01ME0721	CO2 :	Identify the factors affecting the selection of plant location and plant layout to construct the optimum layout within the plant with the use of computerized relationship of facilities/resources.
	01ME0721	CO3 :	Solve MRP-I and MRP-II problems to maintain the lot size according to the demand of products.
	01ME0721	CO4 :	Organize production facilities/resources using scheduling techniques and line of balance.
	01ME0721	CO5 :	Make use of CAPP to manage shop floor data considering database structure and network across the shop floor.
	01ME0721	CO6 :	Examine modern approaches in manufacturing for better shop floor productivity and to optimize it using simulation packages.
	01ME0741	CO2 :	Perform the hydraulic/pneumatic circuit operation to accomplish specific function.
	01ME0741	CO3 :	To analyze the functional requirements of a power transmission system for a given application.
	01ME1722	CO1 :	Able to know data & its structure
	01ME1722	CO2 :	Able to know importance of data analytics in manufacturing
	01ME1722	CO3 :	Able to demonstrate data collection & processing techniques
	01ME1722	CO4 :	Able to select appropriate prediction technique for data analysis
	01ME1722	CO5 :	Able to suggest appropriate diagnosis approach
	<b>8</b>	01ME0801	CO1 :
01ME0801		CO2 :	Design of Jig and fixture for metal cutting.
01ME0801		CO3 :	Apply the knowledge of sheet metal operations in manufacturing industries.
01ME0801		CO4 :	Analyze the machining processes.
01ME0802		CO1 :	Identify a topic which are related to need of industry or society.
01ME0802		CO2 :	Review literature to identify gaps and define objectives & scope of the work.
01ME0802		CO3 :	Reorganize the procedures with a concern for society, environment and ethics.
01ME0802		CO4 :	Develop conceptual and engineering design of any mechanical components and also to fabricate them using different manufacturing tools.



	01ME0803	CO1 :	Understanding the basic concept of various destructive, non destructive and metallurgical testing in casting
	01ME0803	CO2 :	Application of various testing method in casting
	01ME0803	CO3 :	Analysis of various testing method used in casting
	01ME0803	CO4 :	Simulation of different components using AutoCAST.
	01ME0803	CO5 :	Design of circuits using Arduino and Data Taker.
	01ME0811	CO1 :	Students will be able to understand stresses acting in pressure vessel
	01ME0811	CO2 :	Students will be able to design pressure vessel parts as per ASME standards
	01ME0811	CO3 :	Students will be able to design the support of pressure vessel
	01ME0811	CO4 :	Students will be able to understand design consideration of pressure vessel
	01ME0811	CO5 :	Student will be able to design piping system for pressure vessel
	01ME0812	CO1 :	.Student are able to understand the design consideration of Machine tool elements
	01ME0812	CO2 :	.Student are able to design the gearbox for machine tool
	01ME0812	CO3 :	Student are able to design structural element of Machine tool
	01ME0812	CO4 :	Student are able to design the guide-way for Machine tool
	01ME0821	CO1 :	Apply modeling, manufacturing concepts and management principles.
	01ME0821	CO2 :	Classify and compare different manufacturing processes and systems.
	01ME0821	CO3 :	Develop solid models and part program for manufacturing of different machine components.
	01ME0821	CO4 :	Analyze the behavior of manufacturing system using simulation.
	01ME0822	CO1 :	Understanding the basic concept of industry 4.0
	01ME0822	CO2 :	Application of various technology in industry 4.0



	01ME0822	CO3 :	Implementation of various production philosophy in industry 4.0
	01ME0822	CO4 :	Analysis of various processes to implement the industry 4.0



**Marwadi**  
University

Bachelor of Technology  
Department of Mechanical Engineering

**Course Outcome**

**Batch**

**(2018-19)**

**B.Tech. in Mechanical Engineering**





Sem	Subject Code	Sr No	Course Out Comes
1	01CI0101	CO1 :	Recognize importance of Civil engineering and its day to day applications.
	01CI0101	CO2 :	Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
	01CI0101	CO3 :	Describe qualitative comparison between different materials and its selection.
	01CI0101	CO4 :	Analyse the water resources, its harvesting and its consumptive use.
	01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
	01CI0101	CO6 :	Acquaint with the various modes of transportation.
	01CR0103	CO1 :	Understand importance of role of Values in developing self
	01CR0103	CO2 :	Inculcate right values, ethics, attitudes, manners and behaviours for life
	01CR0103	CO3 :	Respond and relate with expectations, competitions and power of networking
	01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
	01EN0101	CO2 :	Know the importance of natural resources for the sustainable development of life.
	01EN0101	CO3 :	Understand the effect of growing population on the Environment.
	01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
	01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
	01GS0101	CO1 :	To Interpret the mechanics of various types of sound waves -what they look like, how they are produced, interact with other sound waves and materials.
	01GS0101	CO2 :	To Describe the basic physical principles and applications of ultrasonic sound.
	01GS0101	CO3 :	To Discuss construction, principle of optical fiber communication. Analyze the structure and properties of lasers to their performance and intended applications .
	01GS0101	CO4 :	To Utilize the concept of superconductivity, magnetic and advanced engineering materials and their behaviors under various system conditions.



	01GS0101	CO5 :	To Explain the need of NDT and its methodologies. Illustrate the properties and mechanisms of nano physics.
	01GS0101	CO6 :	To demonstrate in the laboratory the ability to collect, analyze data and to prepare coherent reports of his or her findings
	01MA1101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
	01MA1101	CO2 :	Apply and solve first order differential equations to real life problems
	01MA1101	CO3 :	Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
	01MA1101	CO4 :	Apply Multiple Integral to evaluate the Surface Area and Volume of any 3D objects.
	01MA1101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
	01MA1101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
	01ME0101	CO1 :	Understand basic terminologies and fundamentals of mechanical system by correlating science concept.
	01ME0101	CO2 :	Apply the governing laws of mechanical engineering to find solution of different systems.
	01ME0101	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.
	01ME0101	CO4 :	Identify functional characteristics of various mechanisms.
	01ME0101	CO5 :	Analyze the various energy conversion cycles and systems.
	01SL0102	CO1 :	To enhance reading skills for academic purposes
	01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes
	01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
	01SL0102	CO4 :	To express their ideas in formal, academic written form
	01SL0103	CO1 :	Develop speaking competence for academic purpose
	01SL0103	CO2 :	Speak on a given topic in the context of technology
2	01SL0103	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements



01SL0103	CO4 :	Enhance the ability to make a presentation on a given topic
01CE0101	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
01CE0101	CO3 :	Express and Distinguish various loops in C language (Analyze).
01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures(Apply)
01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
01CE0101	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
01EE0103	CO1 :	Recognize importance of electrical energy and its day to day applications. (Understand)
01EE0103	CO2 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions. (Apply)
01EE0103	CO3 :	Analyse and solve DC Circuits, AC Single phase and magnetic circuits. (Analyse)
01EE0103	CO4 :	Explain the need of batteries, its characteristics and charging methods. (Remember/Knowledge)
01EE0103	CO5 :	Perceive the detail understanding of construction, operation and applications of various components like Diode, BJT and Op-Amp. (Understand)
01EE0103	CO6 :	Recognize basic electronic devices used in various circuits. (Understand)
01MA1151	CO1 :	Explain the linear dependence of vectors of different vector space.
01MA1151	CO2 :	Apply the concept of Eigen values and vectors in various field of engineering like control theory, vibration analysis, quantum mechanics etc
01MA1151	CO3 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.
01MA1151	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
01MA1151	CO5 :	Determine convergence of improper integrals and explain special functions like Beta, Gama and error functions.
01MA1151	CO6 :	Apply Gauss elimination to solve linear system of equations



	01ME0102	CO1 :	Interpret engineering drawings using fundamental technical mathematics.
	01ME0102	CO2 :	Comprehend the theory of projection.
	01ME0102	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
	01ME0102	CO4 :	To improve their technical communication skill in the form of communicative drawings
	01ME0102	CO5 :	Construct basic and intermediate geometry.
	01ME0102	CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.
	01ME0104	CO1 :	Learn about Application of hand tools and power tools.
	01ME0104	CO2 :	Learn about various operations of machine tools.
	01ME0104	CO3 :	Selection of processes and steps for specific operation
	01ME0104	CO4 :	Knowledge and awareness about various safety related operation
3	01CR0302	CO1 :	Express the basics of human values.
	01CR0302	CO2 :	Articulate human values and grow as responsible human beings in the society
	01CR0302	CO3 :	Develop ethical conduct and deliver their professional duties.
	01CR0302	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level
	01MA0301	CO1 :	Expand Various functions in terms of sine and cosine functions
	01MA0301	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations
	01MA0301	CO3 :	Apply Laplace transform & series solution to solve differential equations.
	01MA0301	CO4 :	Apply the knowledge of differential equations and its solutions to evaluate engineering problems
	01ME0302	CO1 :	Identify the functional characteristics of various machine elements
	01ME0302	CO2 :	Construct specified motion profiles for cam and follower.



01ME0302	CO3 :	Analyze and synthesize planar mechanisms for the motion parameters.
01ME0302	CO4 :	Evaluate gear tooth geometry and analyze the motion of gear trains.
01ME0304	CO1 :	Understand the importance of Design Thinking.
01ME0304	CO2 :	Evaluate the quality of your information and your emotions; keep thinking straight.
01ME0304	CO3 :	Identify skills and personality traits of successful problem solving.
01ME0304	CO4 :	Apply standard problem-solving heuristics to aid in problem solving.
01ME0304	CO5 :	Apply problem-solving techniques to programming activities.
01ME0304	CO6 :	Formulate and successfully communicate the solutions to problems.
01ME0305	CO1 :	To understand the laws of mechanics and their application to an engineering problem.
01ME0305	CO2 :	Apply resultant force to move or equilibrant force to keep the body in equilibrium.
01ME0305	CO3 :	To Apply the fundamentals of stress/strain analysis with confidence to the simple structure.
01ME0305	CO4 :	Apply shear force and bending moment diagrams to analyze the resistance offered by the beam and find the stresses induced in a beam.
01ME0305	CO5 :	To Analyze the Deflection of Beams, Torsion of Circular Shafts.
01ME1301	CO1 :	To identify the fundamentals of Fluid mechanics and define the terminology.
01ME1301	CO2 :	To distinguish between the types of fluid flow.
01ME1301	CO3 :	Apply the basic equation of fluid statics on the plane, curved surfaces, manometers,
01ME1301	CO4 :	Application of continuity and momentum equation, Bernoulli equation .
01ME1301	CO5 :	Apply principles of dimensional analysis and simplitude to simple problems and use of dimensionless parameters.
01ME1301	CO6 :	Ability to analyze fluid flow problems with the application of momentum and energy equation and analyze pipe flow problems.
01ME1303	CO1 :	Select the machine(tool) according to requirements.



	01ME1303	CO2 :	Able to Compare among the different machine tools.
	01ME1303	CO3 :	Develop the sequence of machining operation to produce the end product.
	01ME1303	CO4 :	Analyze any conventional machining operations.
4	01MA0271	CO1 :	Recognize the error in the number generated by the solution
	01MA0271	CO2 :	Compute solution of algebraic and transcendental equation by numerical methods like Bisection method and Newton Rapshon method
	01MA0271	CO3 :	Apply method of interpolation and extrapolation for prediction
	01MA0271	CO4 :	Use numerical methods and tools in the engineering problem solving process.
	01MA0271	CO5 :	Student able to apply numerical integration in engineering problems
	01MA0271	CO6 :	Student able to apply ordinary differential equation in engineering problems
	01ME0404	CO1 :	To elucidate the basic concepts of thermodynamics
	01ME0404	CO2 :	To simplify properties of Ideal and Real Gases
	01ME0404	CO3 :	To express and utilize first law of thermodynamics for closed and open systems
	01ME0404	CO4 :	To determine the feasibility of thermodynamic cycles and processes using second law of thermodynamics
	01ME0404	CO5 :	To make the use of concept of entropy and exergy to different thermodynamic processes and cycles
	01ME0404	CO6 :	To analyze different gas power, vapor power and refrigeration cycles
	01ME0405	CO1 :	Understand the Human Centric approach for design.
	01ME0405	CO2 :	Understand significance of the empathy and solution based on empathy
	01ME0405	CO3 :	Importance of design thinking when addressing social change
	01ME0405	CO4 :	Generate the innovative ideas and will convert in new solutions.
	01ME0405	CO5 :	Build a possible prototype solutions



	01ME1401	CO1 :	Understand terminologies used in machine design.
	01ME1401	CO2 :	Use different theories to design a member as a column or strut.
	01ME1401	CO3 :	Apply different theories of failures to design components subjected to combined loading.
	01ME1401	CO4 :	Select and design various types of temporary and permanent joints such as riveted joint, welded joint, screw joint and power screw.
	01ME1401	CO5 :	Students will be able to scrutinize different static loading conditions such as simple and combined loading for a given machine element.
	01ME1401	CO6 :	Construct Part and assembly drawings by using design standards and symbols in 2D drafting software.
	01ME1402	CO1 :	Application of manufacturing process for making metallic and nonmetallic components.
	01ME1402	CO2 :	Identify and optimize parameters for manufacturing process.
	01ME1402	CO3 :	Design gating system for casting components.
	01ME1402	CO4 :	Application of simulation software for manufacturing processes.
	01ME1403	CO1 :	Enhance the technical knowledge on Engineering materials & its applications.
	01ME1403	CO2 :	Establish important relationships between internal structure, properties and performance of materials during processing and use.
	01ME1403	CO3 :	Design the alloy system based on their knowledge of phase diagrams and metal characteristics.
	01ME1403	CO4 :	Understand different non-destructive testing methods.
	01ME1403	CO5 :	Know the various heat treatment processes for steels.
	01ME1403	CO6 :	Apply the knowledge of Heat treatment process for emphasizing relation between microstructure and mechanical properties.
5	01CR0501	CO1 :	Contrast and understand short pieces of business correspondence reports or proposals. (Understanding)
	01CR0501	CO2 :	Read and Categorize the extracts from business publications. Ask for the information required. (Analyzing)
	01CR0501	CO3 :	Listen to, understand and contribute to discussions in meetings. (Remembering)



	01CR0501	CO4 :	Prepare the presentation on a familiar topic. (Applying)
	01ME0501	CO1 :	Identify effect of gyroscopic couples
	01ME0501	CO2 :	Design governor and flywheel for engines and machines
	01ME0501	CO3 :	Calculate the friction and inertia for different components.
	01ME0501	CO4 :	Analyse the effect due to the static and dynamic forces on machines
	01ME0502	CO1 :	Understand the operation and use of different hydraulic machines like hydraulic turbine, pumps, compressors, etc...
	01ME0502	CO2 :	Apply their knowledge to calculate various performance parameters related to fluid machines.
	01ME0502	CO3 :	Use characteristic curves to forecast the performance of fluid machines for the different operating conditions.
	01ME0502	CO4 :	Analyse the selection of fluid machines.
	01ME0502	CO5 :	Implement laws of fluid to determine basic dimensions of hydraulic machines depending on various field applications.
	01ME0503	CO1 :	Apply the factors to be considered while designing a machine component.
	01ME0503	CO2 :	Apply mathematical knowledge to design mechanical spring.
	01ME0503	CO3 :	Compute the forces and torques involved in Belt drive, Rope drive and Chain drive.
	01ME0503	CO4 :	Analyze components subjected to fluctuating loads.
	01ME0503	CO5 :	Analyze various stresses induced in pressure vessel.
	01ME0504	CO1 :	Understand the basic concept of Metrology & to select instrument for particular measurement. Describing the calibration of instrument
	01ME0504	CO2 :	Demonstration of various instrument for hands on experience.
	01ME0504	CO3 :	Application of various measuring instrument in industry & day to day life
	01ME0504	CO4 :	Analysing the error in measurement & measuring instruments
	01ME0504	CO5 :	Discriminate the various methods of measurement





	01ME0504	CO6 :	Describe the use of advanced measuring instrument
	01ME0505	CO1 :	Understand basics of power plant including thermodynamic cycles, site selection criteria and modern power plant concept.
	01ME0505	CO2 :	Understand working of different types of steam generators and different material handling system for power plant.
	01ME0505	CO3 :	Analyze functioning of condensers and cooling systems.
	01ME0505	CO4 :	Analyze working and performance parameters of different draught systems.
	01ME0505	CO5 :	Understand various types of feed water treatment.
	01ME0505	CO6 :	Understand nuclear power plants with basic physics and new concepts.
	01ME0506	CO1 :	Make use of fundamentals of computer graphics to generate basic entities using algorithms.
	01ME0506	CO2 :	Apply the knowledge of parametric equations to generate curves and surfaces.
	01ME0506	CO3 :	Organize the basic geometric transformations to perform the desired operation.
	01ME0506	CO4 :	Select the concept of clipping for various geometries.
	01ME0507	CO1 :	Choose proper manufacturing system.
	01ME0507	CO2 :	Use different parameters of design
	01ME0507	CO3 :	Analyze different process of material selection
	01ME0507	CO4 :	Design for different parameters in Manufacturing and assembling.
	01ME0508	CO1 :	Understand the problem in the existing process.
	01ME0508	CO2 :	Collect the large number of data/ information for the product
	01ME0508	CO3 :	Depth analyze of the products and extraction of real time data
	01ME0508	CO4 :	Understand the principles behind the design of the product, ways to redesign and improve the performance of the system.
6	01ME0601	CO1 :	Apply fundamental of Balancing to various rotating and reciprocating Mechanical system



01ME0601	CO2 :	Apply fundamental of vibration to various mechanical system to find frequency and measure vibration
01ME0601	CO3 :	Analysis the effect of unbalance force on rotating and reciprocating mechanical system.
01ME0601	CO4 :	Analysis the vibration occurring in various mechanical system and effect of force and damping on vibration system
01ME0602	CO1 :	Distinguish the modes and phenomenological origin of laws for the different modes of heat and mass transfer
01ME0602	CO2 :	Compute heat conduction in a steady and transient state for various geometrics
01ME0602	CO3 :	Predict empirical correlation for analyzing free and forced convection problem
01ME0602	CO4 :	Appraise the performance of heat exchangers by using various design method
01ME0602	CO5 :	Derive radiation heat exchange between black surface, diffuse and gray enclosure
01ME0603	CO1 :	Interpreting the Design procedure of different types of Machine elements.
01ME0603	CO2 :	Identification of the appropriate bearing for the given application.
01ME0603	CO3 :	Examine the dimensions of various I.C.Engine components based on the design equations.
01ME0603	CO4 :	Estimate the gear parameters for various loading conditions.
01ME0604	CO1 :	Describe Characteristics & applications of Operation Research and understand basic terms of scientific method of OR.
01ME0604	CO2 :	Formulate real world problems as a mathematical programming model and solve Linear Programming problems.
01ME0604	CO3 :	Formulate and solve transportation and work/job assignments problems.
01ME0604	CO4 :	Understand policies for the replacement of machines/components in the industry.
01ME0604	CO5 :	Solve problems related to CPM and PERT for project management techniques.
01ME0604	CO6 :	Solve Queuing and Inventory problems related to practical applications.
01ME0605	CO1 :	Identify different types of internal combustion engines, its components and their applications.
01ME0605	CO2 :	Evaluate the performance parameters of the engine and its significance.



	01ME0605	CO3 :	Analyze fuel supply systems, ignition and governing systems of IC engines.	
	01ME0605	CO4 :	Apply various methods of power enhancement such as supercharger and turbocharger.	
	01ME0605	CO5 :	Analyze economic and environmental effects related to emissions from different engines.	
	01ME0605	CO6 :	To evaluate the performance of IC engines based on the different test on SI and CI engines.	
	01ME0606	CO1 :	Understand the basic Fundamentals of Material Handling Equipment.	
	01ME0606	CO2 :	Design various hoisting elements like, chains, Hemp and wire ropes, Pulley systems, Sprockets & drums, forged hooks and eye hooks and Girders.	
	01ME0606	CO3 :	Design a Conveyors and Selection based on the Application.	
	01ME0606	CO4 :	Design of Bucket and Cage Elevator.	
	01ME0607	CO1 :	Application of advanced manufacturing processes	
	01ME0607	CO2 :	Identify the best manufacturing processes for product requirements	
	01ME0607	CO3 :	Analyzing the process parameter for a quality product	
	01ME0607	CO4 :	Use of advanced technology for development of manufacturing processes	
	01ME0607	CO5 :	Understanding the basic concept of advanced machining processes	
	01ME0610	CO1 :	Understand the importance of Design Engineering.	
	01ME0610	CO2 :	Identify various Design Engineering approaches.	
	01ME0610	CO3 :	Apply various methodologies to design the product and in testing the product.	
	01ME0610	CO4 :	Understand various Project Management Processes.	
	01ME0610	CO5 :	Demonstrate effective project execution and control techniques that result in successful projects.	
	7	01ME0701	CO2 :	Apply the knowledge of FEM for 1D stress analysis, heat transfer analysis and fluid flow analysis
		01ME0701	CO3 :	Formulate and solve problems of trusses, beams and frames.



01ME0701	CO4 :	Solve two dimensional FE formulations involving triangular, quadrilateral elements and higher order elements.
01ME0701	CO5 :	Prepare algorithms and write Finite Element code for solving simple design problems and understand the use of commercial packages for complex problems.
01ME0702	CO1 :	Identify a topic which are related to need of industry or society.
01ME0702	CO2 :	Review literature to identify gaps and define objectives & scope of the work.
01ME0702	CO3 :	Reorganize the procedures with a concern for society, environment and ethics.
01ME0702	CO4 :	Develop conceptual and engineering design of any mechanical components and also to fabricate them using different manufacturing tools.
01ME0703	CO1 :	To calculation of pattern allowances applicable for different material.
01ME0703	CO2 :	To choose pattern making using different methods.
01ME0703	CO3 :	To Analyze moulding process for metal casting.
01ME0703	CO4 :	To Analyze filling and feeding system for metal casting
01ME0711	CO1 :	Apply different theories of failures to design mechanical components subjected to Static loading.
01ME0711	CO2 :	To design and analyze mechanical components subjected to dynamic loading.
01ME0711	CO3 :	To apply Fracture mechanics & Creep theories for the design of mechanical components
01ME0711	CO4 :	To design a Mechanical component subjected to surface stresses and analyze their failure
01ME0721	CO1 :	Develop understanding of various types of production systems
01ME0721	CO2 :	Identify the factors affecting the selection of plant location and plant layout to construct the optimum layout within the plant with the use of computerized relationship of facilities/resources.
01ME0721	CO3 :	Solve MRP-I and MRP-II problems to maintain the lot size according to the demand of products.
01ME0721	CO4 :	Organize production facilities/resources using scheduling techniques and line of balance.
01ME0721	CO5 :	Make use of CAPP to manage shop floor data considering database structure and network across the shop floor.



	01ME0721	CO6 :	Examine modern approaches in manufacturing for better shop floor productivity and to optimize it using simulation packages.
	01ME0731	CO1 :	Gathering basic concepts and knowledge of Refrigeration and Air-Conditioning system.
	01ME0731	CO2 :	Analyze performance parameters of Air-refrigeration system, Vapour Compression & Vapour Absorption Refrigeration by using various refrigerants.
	01ME0731	CO3 :	Examine different terminology of psychrometry and psychrometric processes for human comfort with load calculation sheet
	01ME0731	CO4 :	Predict the duct design method and air distribution system for analyzing duct and piping system
	01ME0731	CO5 :	Categorize refrigeration and air-conditioning system components based on application
	01ME0732	CO1 :	Illustrate the principle of energy conversion from alternate sources like solar, wind, ocean, geothermal, ocean, biomass
	01ME0732	CO2 :	Design & Analyse various renewable energy system.
	01ME0732	CO3 :	Economic analysis RE system and acquire knowledge about modern technologies
	01ME0732	CO4 :	Examine the need of renewable energy sources, future scope, advantages, disadvantages and comparison of various renewable sources
	01ME0741	CO2 :	Perform the hydraulic/pneumatic circuit operation to accomplish specific function.
	01ME0741	CO3 :	To analyze the functional requirements of a power transmission system for a given application.
	01ME1722	CO1 :	Able to know data & its structure
	01ME1722	CO2 :	Able to know importance of data analytics in manufacturing
	01ME1722	CO3 :	Able to demonstrate data collection & processing techniques
	01ME1722	CO4 :	Able to select appropriate prediction technique for data analysis
	01ME1722	CO5 :	Able to suggest appropriate diagnosis approach
8	01ME0801	CO1 :	Understand the basic concept of Production Technology.
	01ME0801	CO2 :	Design of Jig and fixture for metal cutting.
	01ME0801	CO3 :	Apply the knowledge of sheet metal operations in manufacturing industries.



01ME0801	CO4 :	Analyze the machining processes.
01ME0803	CO1 :	Understanding the basic concept of various destructive, non destructive and metallurgical testing in casting
01ME0803	CO2 :	Application of various testing method in casting
01ME0803	CO3 :	Analysis of various testing method used in casting
01ME0803	CO4 :	Simulation of different components using AutoCAST.
01ME0803	CO5 :	Design of circuits using Arduino and Data Taker.
01ME0811	CO1 :	Students will be able to understand stresses acting in pressure vessel
01ME0811	CO2 :	Students will be able to design pressure vessel parts as per ASME standards
01ME0811	CO3 :	Students will be able to design the support of pressure vessel
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01ME0812	CO3 :	Student are able to design structural element of Machine tool
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01ME0821	CO1 :	Apply modeling, manufacturing concepts and management principles.
01ME0821	CO2 :	Classify and compare different manufacturing processes and systems.
01ME0821	CO3 :	Develop solid models and part program for manufacturing of different machine components.
01ME0821	CO4 :	Analyze the behavior of manufacturing system using simulation.
01ME0822	CO1 :	Understanding the basic concept of industry 4.0



	01ME0822	CO2 :	Application of various technology in industry 4.0
	01ME0822	CO3 :	Implementation of various production philosophy in industry 4.0
	01ME0822	CO4 :	Analysis of various processes to implement the industry 4.0
	01ME0831	CO1 :	Distinguish type of nozzle based on mach number
	01ME0831	CO2 :	Analyze the performance of steam nozzle
	01ME0831	CO3 :	Evaluate the performance of steam turbine
	01ME0831	CO4 :	Analyze thermodynamic cycles of gas turbine power plant
	01ME0831	CO5 :	Analyze the working of jet propulsion technology
	01ME0832	CO1 :	To develop perception of major theories, approaches and methodologies used in CFD.
	01ME0832	CO2 :	To apply differential equations to Fluid Dynamic problems.
	01ME0832	CO3 :	To gain the elementary knowledge of finite elements method for flow and heat transfer problems.
	01ME0832	CO4 :	To analyse the numerical simulation to solve major engineering design problems involving fluid flow and heat transfer.
	01ME0832	CO5 :	To build up the skills in the implementation of CFD methods (e.g. boundary conditions.) in actual engineering using commercial CFD codes.
	01ME1802	CO1 :	To Design and Analyze Mechanical System.
	01ME1802	CO2 :	To perform Product design and development tasks.
	01ME1802	CO3 :	To perform Industry need based project.
	01ME1802	CO4 :	To Conducting preliminary analysis/ Modeling/ Simulation/ Experiment/ Design/ Feasibility



**Marwadi**  
University

Bachelor of Technology  
Department of Mechanical Engineering

**Course Outcome**

**Batch**

**(2019-20)**

**B.Tech. in Mechanical Engineering**





Sem	Subject Code	Sr No	Course Out Comes
1	01CI0101	CO1 :	Recognize importance of Civil engineering and its day to day applications.
	01CI0101	CO2 :	Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
	01CI0101	CO3 :	Describe qualitative comparison between different materials and its selection.
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	01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
	01CI0101	CO6 :	Acquaint with the various modes of transportation.
	01CR0103	CO1 :	Understand importance of role of Values in developing self
	01CR0103	CO2 :	Inculcate right values, ethics, attitudes, manners and behaviours for life
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	01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
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	01EN0101	CO3 :	Understand the effect of growing population on the Environment.
	01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
	01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
	01MA1101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
	01MA1101	CO2 :	Apply and solve first order differential equations to real life problems
	01MA1101	CO3 :	Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
	01MA1101	CO4 :	Apply Multiple Integral to evaluate the Surface Area and Volume of any 3D objects.



	01MA1101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
	01MA1101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
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01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
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01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures(Apply)
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01ME0304	CO4 :	Apply standard problem-solving heuristics to aid in problem solving.
01ME0304	CO5 :	Apply problem-solving techniques to programming activities.
01ME0304	CO6 :	Formulate and successfully communicate the solutions to problems.
01ME0305	CO1 :	To understand the laws of mechanics and their application to an engineering problem.
01ME0305	CO2 :	Apply resultant force to move or equilibrant force to keep the body in equilibrium.
01ME0305	CO3 :	To Apply the fundamentals of stress/strain analysis with confidence to the simple structure.
01ME0305	CO4 :	Apply shear force and bending moment diagrams to analyze the resistance offered by the beam and find the stresses induced in a beam.
01ME0305	CO5 :	To Analyze the Deflection of Beams, Torsion of Circular Shafts.
01ME1301	CO1 :	To identify the fundamentals of Fluid mechanics and define the terminology.
01ME1301	CO2 :	To distinguish between the types of fluid flow.
01ME1301	CO3 :	Apply the basic equation of fluid statics on the plane, curved surfaces, manometers,
01ME1301	CO4 :	Application of continuity and momentum equation, Bernoulli equation .
01ME1301	CO5 :	Apply principles of dimensional analysis and similitude to simple problems and use of dimensionless parameters.
01ME1301	CO6 :	Ability to analyze fluid flow problems with the application of momentum and energy equation and analyze pipe flow problems.



	01ME1303	CO1 :	Select the machine(tool) according to requirements.
	01ME1303	CO2 :	Able to Compare among the different machine tools.
	01ME1303	CO3 :	Develop the sequence of machining operation to produce the end product.
	01ME1303	CO4 :	Analyze any conventional machining operations.
4	01MA0271	CO1 :	Recognize the error in the number generated by the solution
	01MA0271	CO2 :	Compute solution of algebraic and transcendental equation by numerical methods like Bisection method and Newton Rapshon method
	01MA0271	CO3 :	Apply method of interpolation and extrapolation for prediction
	01MA0271	CO4 :	Use numerical methods and tools in the engineering problem solving process.
	01MA0271	CO5 :	Student able to apply numerical integration in engineering problems
	01MA0271	CO6 :	Student able to apply ordinary differential equation in engineering problems
	01ME0404	CO1 :	To elucidate the basic concepts of thermodynamics
	01ME0404	CO2 :	To simplify properties of Ideal and Real Gases
	01ME0404	CO3 :	To express and utilize first law of thermodynamics for closed and open systems
	01ME0404	CO4 :	To determine the feasibility of thermodynamic cycles and processes using second law of thermodynamics
	01ME0404	CO5 :	To make the use of concept of entropy and exergy to different thermodynamic processes and cycles
	01ME0404	CO6 :	To analyze different gas power, vapor power and refrigeration cycles
	01ME0405	CO1 :	Understand the Human Centric approach for design.
	01ME0405	CO2 :	Understand significance of the empathy and solution based on empathy
	01ME0405	CO3 :	Importance of design thinking when addressing social change
	01ME0405	CO4 :	Generate the innovative ideas and will convert in new solutions.



	01ME0405	CO5 :	Build a possible prototype solutions
	01ME1401	CO1 :	Understand terminologies used in machine design.
	01ME1401	CO2 :	Use different theories to design a member as a column or strut.
	01ME1401	CO3 :	Apply different theories of failures to design components subjected to combined loading.
	01ME1401	CO4 :	Select and design various types of temporary and permanent joints such as riveted joint, welded joint, screw joint and power screw.
	01ME1401	CO5 :	Students will be able to scrutinize different static loading conditions such as simple and combined loading for a given machine element.
	01ME1401	CO6 :	Construct Part and assembly drawings by using design standards and symbols in 2D drafting software.
	01ME1402	CO1 :	Application of manufacturing process for making metallic and nonmetallic components.
	01ME1402	CO2 :	Identify and optimize parameters for manufacturing process.
	01ME1402	CO3 :	Design gating system for casting components.
	01ME1402	CO4 :	Application of simulation software for manufacturing processes.
	01ME1403	CO1 :	Enhance the technical knowledge on Engineering materials & its applications.
	01ME1403	CO2 :	Establish important relationships between internal structure, properties and performance of materials during processing and use.
	01ME1403	CO3 :	Design the alloy system based on their knowledge of phase diagrams and metal characteristics.
	01ME1403	CO4 :	Understand different non-destructive testing methods.
	01ME1403	CO5 :	Know the various heat treatment processes for steels.
	01ME1403	CO6 :	Apply the knowledge of Heat treatment process for emphasizing relation between microstructure and mechanical properties.
	5	01CR0501	CO1 :
01CR0501		CO2 :	Read and Categorize the extracts from business publications. Ask for the information required. (Analyzing)
01CR0501		CO3 :	Listen to, understand and contribute to discussions in meetings. (Remembering)



01CR0501	CO4 :	Prepare the presentation on a familiar topic. (Applying)
01ME0501	CO1 :	Identify effect of gyroscopic couples
01ME0501	CO2 :	Design governor and flywheel for engines and machines
01ME0501	CO3 :	Calculate the friction and inertia for different components.
01ME0501	CO4 :	Analyse the effect due to the static and dynamic forces on machines
01ME0502	CO1 :	Understand the operation and use of different hydraulic machines like hydraulic turbine, pumps, compressors, etc...
01ME0502	CO2 :	Apply their knowledge to calculate various performance parameters related to fluid machines.
01ME0502	CO3 :	Use characteristic curves to forecast the performance of fluid machines for the different operating conditions.
01ME0502	CO4 :	Analyse the selection of fluid machines.
01ME0502	CO5 :	Implement laws of fluid to determine basic dimensions of hydraulic machines depending on various field applications.
01ME0503	CO1 :	Apply the factors to be considered while designing a machine component.
01ME0503	CO2 :	Apply mathematical knowledge to design mechanical spring.
01ME0503	CO3 :	Compute the forces and torques involved in Belt drive, Rope drive and Chain drive.
01ME0503	CO4 :	Analyze components subjected to fluctuating loads.
01ME0503	CO5 :	Analyze various stresses induced in pressure vessel.
01ME0504	CO1 :	Understand the basic concept of Metrology & to select instrument for particular measurement. Describing the calibration of instrument
01ME0504	CO2 :	Demonstration of various instrument for hands on experience.
01ME0504	CO3 :	Application of various measuring instrument in industry & day to day life
01ME0504	CO4 :	Analysing the error in measurement & measuring instruments
01ME0504	CO5 :	Discriminate the various methods of measurement





	01ME0504	CO6 :	Describe the use of advanced measuring instrument
	01ME0505	CO1 :	Understand basics of power plant including thermodynamic cycles, site selection criteria and modern power plant concept.
	01ME0505	CO2 :	Understand working of different types of steam generators and different material handling system for power plant.
	01ME0505	CO3 :	Analyze functioning of condensers and cooling systems.
	01ME0505	CO4 :	Analyze working and performance parameters of different draught systems.
	01ME0505	CO5 :	Understand various types of feed water treatment.
	01ME0505	CO6 :	Understand nuclear power plants with basic physics and new concepts.
	01ME0506	CO1 :	Make use of fundamentals of computer graphics to generate basic entities using algorithms.
	01ME0506	CO2 :	Apply the knowledge of parametric equations to generate curves and surfaces.
	01ME0506	CO3 :	Organize the basic geometric transformations to perform the desired operation.
	01ME0506	CO4 :	Select the concept of clipping for various geometries.
	01ME0507	CO1 :	Choose proper manufacturing system.
	01ME0507	CO2 :	Use different parameters of design
	01ME0507	CO3 :	Analyze different process of material selection
	01ME0507	CO4 :	Design for different parameters in Manufacturing and assembling.
	01ME0508	CO1 :	Understand the problem in the existing process.
	01ME0508	CO2 :	Collect the large number of data/ information for the product
	01ME0508	CO3 :	Depth analyze of the products and extraction of real time data
	01ME0508	CO4 :	Understand the principles behind the design of the product, ways to redesign and improve the performance of the system.
6	01ME0601	CO1 :	Apply fundamental of Balancing to various rotating and reciprocating Mechanical system



01ME0601	CO2 :	Apply fundamental of vibration to various mechanical system to find frequency and measure vibration
01ME0601	CO3 :	Analysis the effect of unbalance force on rotating and reciprocating mechanical system.
01ME0601	CO4 :	Analysis the vibration occurring in various mechanical system and effect of force and damping on vibration system
01ME0602	CO1 :	Distinguish the modes and phenomenological origin of laws for the different modes of heat and mass transfer
01ME0602	CO2 :	Compute heat conduction in a steady and transient state for various geometrics
01ME0602	CO3 :	Predict empirical correlation for analyzing free and forced convection problem
01ME0602	CO4 :	Appraise the performance of heat exchangers by using various design method
01ME0602	CO5 :	Derive radiation heat exchange between black surface, diffuse and gray enclosure
01ME0603	CO1 :	Interpreting the Design procedure of different types of Machine elements.
01ME0603	CO2 :	Identification of the appropriate bearing for the given application.
01ME0603	CO3 :	Examine the dimensions of various I.C.Engine components based on the design equations.
01ME0603	CO4 :	Estimate the gear parameters for various loading conditions.
01ME0604	CO1 :	Describe Characteristics & applications of Operation Research and understand basic terms of scientific method of OR.
01ME0604	CO2 :	Formulate real world problems as a mathematical programming model and solve Linear Programming problems.
01ME0604	CO3 :	Formulate and solve transportation and work/job assignments problems.
01ME0604	CO4 :	Understand policies for the replacement of machines/components in the industry.
01ME0604	CO5 :	Solve problems related to CPM and PERT for project management techniques.
01ME0604	CO6 :	Solve Queuing and Inventory problems related to practical applications.
01ME0605	CO1 :	Identify different types of internal combustion engines, its components and their applications.
01ME0605	CO2 :	Evaluate the performance parameters of the engine and its significance.



	01ME0605	CO3 :	Analyze fuel supply systems, ignition and governing systems of IC engines.
	01ME0605	CO4 :	Apply various methods of power enhancement such as supercharger and turbocharger.
	01ME0605	CO5 :	Analyze economic and environmental effects related to emissions from different engines.
	01ME0605	CO6 :	To evaluate the performance of IC engines based on the different test on SI and CI engines.
	01ME0606	CO1 :	Understand the basic Fundamentals of Material Handling Equipment.
	01ME0606	CO2 :	Design various hoisting elements like, chains, Hemp and wire ropes, Pulley systems, Sprockets & drums, forged hooks and eye hooks and Girders.
	01ME0606	CO3 :	Design a Conveyors and Selection based on the Application.
	01ME0606	CO4 :	Design of Bucket and Cage Elevator.
	01ME0607	CO1 :	Application of advanced manufacturing processes
	01ME0607	CO2 :	Identify the best manufacturing processes for product requirements
	01ME0607	CO3 :	Analyzing the process parameter for a quality product
	01ME0607	CO4 :	Use of advanced technology for development of manufacturing processes
	01ME0607	CO5 :	Understanding the basic concept of advanced machining processes
	01ME0610	CO1 :	Understand the importance of Design Engineering.
	01ME0610	CO2 :	Identify various Design Engineering approaches.
	01ME0610	CO3 :	Apply various methodologies to design the product and in testing the product.
	01ME0610	CO4 :	Understand various Project Management Processes.
	01ME0610	CO5 :	Demonstrate effective project execution and control techniques that result in successful projects.
7	01ME0701	CO2 :	Apply the knowledge of FEM for 1D stress analysis, heat transfer analysis and fluid flow analysis
	01ME0701	CO3 :	Formulate and solve problems of trusses, beams and frames.



01ME0701	CO4 :	Solve two dimensional FE formulations involving triangular, quadrilateral elements and higher order elements.
01ME0701	CO5 :	Prepare algorithms and write Finite Element code for solving simple design problems and understand the use of commercial packages for complex problems.
01ME0702	CO1 :	Identify a topic which are related to need of industry or society.
01ME0702	CO2 :	Review literature to identify gaps and define objectives & scope of the work.
01ME0702	CO3 :	Reorganize the procedures with a concern for society, environment and ethics.
01ME0702	CO4 :	Develop conceptual and engineering design of any mechanical components and also to fabricate them using different manufacturing tools.
01ME0703	CO1 :	To calculation of pattern allowances applicable for different material.
01ME0703	CO2 :	To choose pattern making using different methods.
01ME0703	CO3 :	To Analyze moulding process for metal casting.
01ME0703	CO4 :	To Analyze filling and feeding system for metal casting
01ME0721	CO1 :	Develop understanding of various types of production systems
01ME0721	CO2 :	Identify the factors affecting the selection of plant location and plant layout to construct the optimum layout within the plant with the use of computerized relationship of facilities/resources.
01ME0721	CO3 :	Solve MRP-I and MRP-II problems to maintain the lot size according to the demand of products.
01ME0721	CO4 :	Organize production facilities/resources using scheduling techniques and line of balance.
01ME0721	CO5 :	Make use of CAPP to manage shop floor data considering database structure and network across the shop floor.
01ME0721	CO6 :	Examine modern approaches in manufacturing for better shop floor productivity and to optimize it using simulation packages.
01ME0722	CO1 :	Understanding the basic concept of Data Mining
01ME0722	CO2 :	Apply the data mining in production system
01ME0722	CO3 :	Identify the best tool of data mining for production system



	01ME0722	CO4 :	Solve the issue of production system using the various data mining tools
	01ME0722	CO5 :	Use of Modern data mining tool in production
	01ME0731	CO1 :	Gathering basic concepts and knowledge of Refrigeration and Air-Conditioning system.
	01ME0731	CO2 :	Analyze performance parameters of Air-refrigeration system, Vapour Compression & Vapour Absorption Refrigeration by using various refrigerants.
	01ME0731	CO3 :	Examine different terminology of psychrometry and psychrometric processes for human comfort with load calculation sheet
	01ME0731	CO4 :	Predict the duct design method and air distribution system for analyzing duct and piping system
	01ME0731	CO5 :	Categorize refrigeration and air-conditioning system components based on application
	01ME0732	CO1 :	Illustrate the principle of energy conversion from alternate sources like solar, wind, ocean, geothermal, ocean, biomass
	01ME0732	CO2 :	Design & Analyse various renewable energy system.
	01ME0732	CO3 :	Economic analysis RE system and acquire knowledge about modern technologies
	01ME0732	CO4 :	Examine the need of renewable energy sources, future scope, advantages, disadvantages and comparison of various renewable sources
	01ME0741	CO2 :	Perform the hydraulic/pneumatic circuit operation to accomplish specific function.
	01ME0741	CO3 :	To analyze the functional requirements of a power transmission system for a given application.



**Marwadi**  
University

Bachelor of Technology  
Department of Mechanical Engineering

**Course Outcome**

**Batch**

**(2020-21)**

**B.Tech. in Mechanical Engineering**



Sem	Subject Code	Sr No	Course Out Comes
<b>1</b>	01CI0101	CO1 :	Recognize importance of Civil engineering and its day to day applications.
	01CI0101	CO2 :	Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
	01CI0101	CO3 :	Describe qualitative comparison between different materials and its selection.
	01CI0101	CO4 :	Analyse the water resources, its harvesting and its consumptive use.
	01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
	01CI0101	CO6 :	Acquaint with the various modes of transportation.
	01CR0103	CO1 :	Understand importance of role of Values in developing self
	01CR0103	CO2 :	Inculcate right values, ethics, attitudes, manners and behaviours for life
	01CR0103	CO3 :	Respond and relate with expectations, competitions and power of networking
	01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
	01EN0101	CO2 :	Know the importance of natural resources for the sustainable development of life.
	01EN0101	CO3 :	Understand the effect of growing population on the Environment.
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	01ME0304	CO3 :	Identify skills and personality traits of successful problem solving.
	01ME0304	CO4 :	Apply standard problem-solving heuristics to aid in problem solving.
	01ME0304	CO5 :	Apply problem-solving techniques to programming activities.
	01ME0304	CO6 :	Formulate and successfully communicate the solutions to problems.
	01ME0305	CO1 :	To understand the laws of mechanics and their application to an engineering problem.
	01ME0305	CO2 :	Apply resultant force to move or equilibrant force to keep the body in equilibrium.
	01ME0305	CO3 :	To Apply the fundamentals of stress/strain analysis with confidence to the simple structure.
	01ME0305	CO4 :	Apply shear force and bending moment diagrams to analyze the resistance offered by the beam and find the stresses induced in a beam.
	01ME0305	CO5 :	To Analyze the Deflection of Beams, Torsion of Circular Shafts.
	01ME1301	CO1 :	To identify the fundamentals of Fluid mechanics and define the terminology.
	01ME1301	CO2 :	To distinguish between the types of fluid flow.
	01ME1301	CO3 :	Apply the basic equation of fluid statics on the plane, curved surfaces, manometers,
	01ME1301	CO4 :	Application of continuity and momentum equation, Bernoulli equation .
	01ME1301	CO5 :	Apply principles of dimensional analysis and similitude to simple problems and use of dimensionless parameters.
	01ME1301	CO6 :	Ability to analyze fluid flow problems with the application of momentum and energy equation and analyze pipe flow problems.



	01ME1303	CO1 :	Select the machine(tool) according to requirements.
	01ME1303	CO2 :	Able to Compare among the different machine tools.
	01ME1303	CO3 :	Develop the sequence of machining operation to produce the end product.
	01ME1303	CO4 :	Analyze any conventional machining operations.
4	01MA0271	CO1 :	Recognize the error in the number generated by the solution
	01MA0271	CO2 :	Compute solution of algebraic and transcendental equation by numerical methods like Bisection method and Newton Rapshon method
	01MA0271	CO3 :	Apply method of interpolation and extrapolation for prediction
	01MA0271	CO4 :	Use numerical methods and tools in the engineering problem solving process.
	01MA0271	CO5 :	Student able to apply numerical integration in engineering problems
	01MA0271	CO6 :	Student able to apply ordinary differential equation in engineering problems
	01ME0404	CO1 :	To elucidate the basic concepts of thermodynamics
	01ME0404	CO2 :	To simplify properties of Ideal and Real Gases
	01ME0404	CO3 :	To express and utilize first law of thermodynamics for closed and open systems
	01ME0404	CO4 :	To determine the feasibility of thermodynamic cycles and processes using second law of thermodynamics
	01ME0404	CO5 :	To make the use of concept of entropy and exergy to different thermodynamic processes and cycles
	01ME0404	CO6 :	To analyze different gas power, vapor power and refrigeration cycles
	01ME0406	CO1 :	Importance of creativity, problem solving and innovation while addressing science, engineering and social issues.
	01ME0406	CO2 :	Demonstrate the ability to contextualize knowledge related to professional engineering practices.
	01ME0406	CO3 :	Demonstrate the functioning effectively as an individual and team member.
	01ME0406	CO4 :	Ability to engage in life-long learning in the context of technological change.



	01ME1401	CO1 :	Understand terminologies used in machine design.
	01ME1401	CO2 :	Use different theories to design a member as a column or strut.
	01ME1401	CO3 :	Apply different theories of failures to design components subjected to combined loading.
	01ME1401	CO4 :	Select and design various types of temporary and permanent joints such as riveted joint, welded joint, screw joint and power screw.
	01ME1401	CO5 :	Students will be able to scrutinize different static loading conditions such as simple and combined loading for a given machine element.
	01ME1401	CO6 :	Construct Part and assembly drawings by using design standards and symbols in 2D drafting software.
	01ME1402	CO1 :	Application of manufacturing process for making metallic and nonmetallic components.
	01ME1402	CO2 :	Identify and optimize parameters for manufacturing process.
	01ME1402	CO3 :	Design gating system for casting components.
	01ME1402	CO4 :	Application of simulation software for manufacturing processes.
	01ME1403	CO1 :	Enhance the technical knowledge on Engineering materials & its applications.
	01ME1403	CO2 :	Establish important relationships between internal structure, properties and performance of materials during processing and use.
	01ME1403	CO3 :	Design the alloy system based on their knowledge of phase diagrams and metal characteristics.
	01ME1403	CO4 :	Understand different non-destructive testing methods.
	01ME1403	CO5 :	Know the various heat treatment processes for steels.
	01ME1403	CO6 :	Apply the knowledge of Heat treatment process for emphasizing relation between microstructure and mechanical properties.
<b>5</b>	01CR0501	CO1 :	Contrast and understand short pieces of business correspondence reports or proposals. (Understanding)
	01CR0501	CO2 :	Read and Categorize the extracts from business publications. Ask for the information required. (Analyzing)
	01CR0501	CO3 :	Listen to, understand and contribute to discussions in meetings. (Remembering)
	01CR0501	CO4 :	Prepare the presentation on a familiar topic. (Applying)



	01ME0501	CO1 :	Identify effect of gyroscopic couples
	01ME0501	CO2 :	Design governor and flywheel for engines and machines
	01ME0501	CO3 :	Calculate the friction and inertia for different components.
	01ME0501	CO4 :	Analyse the effect due to the static and dynamic forces on machines
	01ME0502	CO1 :	Understand the operation and use of different hydraulic machines like hydraulic turbine, pumps, compressors, etc...
	01ME0502	CO2 :	Apply their knowledge to calculate various performance parameters related to fluid machines.
	01ME0502	CO3 :	Use characteristic curves to forecast the performance of fluid machines for the different operating conditions.
	01ME0502	CO4 :	Analyse the selection of fluid machines.
	01ME0502	CO5 :	Implement laws of fluid to determine basic dimensions of hydraulic machines depending on various field applications.
	01ME0503	CO1 :	Apply the factors to be considered while designing a machine component.
	01ME0503	CO2 :	Apply mathematical knowledge to design mechanical spring.
	01ME0503	CO3 :	Compute the forces and torques involved in Belt drive, Rope drive and Chain drive.
	01ME0503	CO4 :	Analyze components subjected to fluctuating loads.
	01ME0503	CO5 :	Analyze various stresses induced in pressure vessel.
	01ME0504	CO1 :	Understand the basic concept of Metrology & to select instrument for particular measurement. Describing the calibration of instrument
	01ME0504	CO2 :	Demonstration of various instrument for hands on experience.
	01ME0504	CO3 :	Application of various measuring instrument in industry & day to day life
	01ME0504	CO4 :	Analysing the error in measurement & measuring instruments
	01ME0504	CO5 :	Discriminate the various methods of measurement
	01ME0504	CO6 :	Describe the use of advanced measuring instrument



	01ME0505	CO1 :	Understand basics of power plant including thermodynamic cycles, site selection criteria and modern power plant concept.
	01ME0505	CO2 :	Understand working of different types of steam generators and different material handling system for power plant.
	01ME0505	CO3 :	Analyze functioning of condensers and cooling systems.
	01ME0505	CO4 :	Analyze working and performance parameters of different draught systems.
	01ME0505	CO5 :	Understand various types of feed water treatment.
	01ME0505	CO6 :	Understand nuclear power plants with basic physics and new concepts.
	01ME0506	CO1 :	Make use of fundamentals of computer graphics to generate basic entities using algorithms.
	01ME0506	CO2 :	Apply the knowledge of parametric equations to generate curves and surfaces.
	01ME0506	CO3 :	Organize the basic geometric transformations to perform the desired operation.
	01ME0506	CO4 :	Select the concept of clipping for various geometries.
	01ME0507	CO1 :	Choose proper manufacturing system.
	01ME0507	CO2 :	Use different parameters of design
	01ME0507	CO3 :	Analyze different process of material selection
	01ME0507	CO4 :	Design for different parameters in Manufacturing and assembling.
	01ME0508	CO1 :	Understand the problem in the existing process.
	01ME0508	CO2 :	Collect the large number of data/ information for the product
	01ME0508	CO3 :	Depth analyze of the products and extraction of real time data
	01ME0508	CO4 :	Understand the principles behind the design of the product, ways to redesign and improve the performance of the system.



**Marwadi**  
University

Bachelor of Technology  
Department of Mechanical Engineering

**Course Outcome**

**Batch**

**(2021-22)**

**B.Tech. in Mechanical Engineering**





Sem	Subject Code	Sr No	Course Out Comes
1	01CI1101	CO1 :	Recognize importance of civil engineering and its day to day applications
	01CI1101	CO2 :	Interpret the plan/map; locate the objects on ground from map and from site to on paper plan/map.
	01CI1101	CO3 :	Describe qualitative comparison between different materials and its selection.
	01CI1101	CO4 :	Create & interpret building planning and will be able to draw plan, section and elevation.
	01CI1101	CO5 :	Acquaint with the various modes of transportation.
	01CR1103	CO1 :	Understand importance of role of Values in developing self
	01CR1103	CO2 :	Inculcate right values, ethics, attitudes, manners and behaviours for life
	01CR1103	CO3 :	Respond and relate with expectations, competitions and power of networking
	01EN1101	CO1 :	Understand and realize the multidisciplinary nature of Environment and its components.
	01EN1101	CO2 :	Know the importance of natural resources for the sustainable development of life.
	01EN1101	CO3 :	Understand the effect of growing population on the Environment.
	01EN1101	CO4 :	Classify the different types of pollution and measure to control pollution
	01EN1101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
	01GS2101	CO1 :	Obtain knowledge about various Non-Destructive-Testing methods and use it in various engineering fields.
	01GS2101	CO2 :	Acquire knowledge about various crystal structures and important properties of different materials.
	01GS2101	CO3 :	Understand basic properties of superconducting materials and check its industrial applications.
	01GS2101	CO4 :	Prepare Nano materials and use it for various engineering applications
	01MA2101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
	01MA2101	CO2 :	Apply and solve first order differential equations to real life problems



	01MA2101	CO3 :	Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
	01MA2101	CO4 :	Apply Multiple Integral to evaluate the Surface Area and Volume of any 3D objects.
	01MA2101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
	01MA2101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
	01ME1101	CO1 :	To understand the basic terminology of Mechanical systems.
	01ME1101	CO2 :	To able to make elementary calculations of ideal gases and steam.
	01ME1101	CO3 :	To understand working and construction of different boilers and mountings and accessories.
	01ME1101	CO4 :	To analyze the performance of I.C. engines.
	01ME1101	CO5 :	To understand working and construction of pump and various refrigeration cycles.
	01ME1101	CO6 :	To understand various power transmission elements.
	01SL0102	CO1 :	To enhance reading skills for academic purposes
	01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes
	01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
	01SL0102	CO4 :	To express their ideas in formal, academic written form
	01SL0103	CO1 :	Develop speaking competence for academic purpose
	01SL0103	CO2 :	Speak on a given topic in the context of technology
	01SL0103	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements
	01SL0103	CO4 :	Enhance the ability to make a presentation on a given topic
<b>2</b>	01CE1101	CO1 :	Able to explain programming problems logically through flow charts and algorithms.
	01CE1101	CO2 :	Identify programming principles using C Language.



	01CE1101	CO3 :	Demonstrate problem solving skills through C Language.
	01CE1101	CO4 :	Generate computer-based solution for real time problem using programming language.
	01CE1101	CO5 :	Develop confidence to self-educate new programming languages.
	01EE1101	CO1 :	Analyze electrical circuits with different elements
	01EE1101	CO2 :	Apply principle of electromagnetic for electromechanical energy conversion in machines
	01EE1101	CO3 :	Choose a semiconductor circuit based on a given application.
	01EE1101	CO4 :	Describe the operation of various OpAmp circuits.
	01EE1101	CO5 :	Define the role of electrical apparatus used in household applications
	01MA0103	CO1 :	Apply vectors in higher dimensional space in experimental data, graphical images, civil and mechanical systems.
	01MA0103	CO2 :	apply System of linear equations in solving the problems of electrical and mechanical engineering, applied mechanics etc.
	01MA0103	CO3 :	Apply the concept of Eigen values and vectors in various field of engineering like control theory, vibration analysis, quantum mechanics etc.
	01MA0103	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
	01ME1102	CO1 :	Know, understand and able to define the methods of engineering drawing
	01ME1102	CO2 :	Learn basic sketching methods
	01ME1102	CO3 :	Understand engineering drawings using fundamental mathematics
	01ME1102	CO4 :	Construct Engineered Drawing
	01ME1102	CO5 :	Develop visualization skills so that they can create new product design
	01ME1102	CO6 :	Understand the theory of projection, Learn technical communication skill
<b>3</b>	01CR0302	CO1 :	Express the basics of human values.
	01CR0302	CO2 :	Articulate human values and grow as responsible human beings in the society



	01CR0302	CO3 :	Develop ethical conduct and deliver their professional duties.
	01CR0302	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level

**Course Outcome**  
**Batch**  
**(2016-20)**  
**B.Tech. in Civil Engineering**

Batch	Stream	Sem	Subject Code	Sr No	Course Out Comes
1617	CIVIL ENGINEERING	1	01CE0101	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
			01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
			01CE0101	CO3 :	Express and Distinguish various loops in C language (Analyze).
			01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures (Apply)
			01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
			01CE0101	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
			01CI0101	CO1 :	Recognize importance of Civil engineering and its day to day applications.
			01CI0101	CO2 :	Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
			01CI0101	CO3 :	Describe qualitative comparison between different materials and its selection.
			01CI0101	CO4 :	Analyse the water resources, its harvesting and its consumptive use.
			01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
			01CI0101	CO6 :	Acquaint with the various modes of transportation.
			01CR0101	CO1 :	Understands how to use different tools of language in order to communicate effectively.
			01CR0101	CO2 :	Applies appropriate grammatical structures and a wide range of vocabulary in spoken and written discourse.
			01CR0101	CO3 :	Choose appropriate alternatives in personal and professional life.
			01CR0101	CO4 :	Displaying the best of the professional attitude and behavior.
			01GS0101	CO1 :	To Interpret the mechanics of various types of sound waves -what they look like, how they are produced, interact with other sound waves and materials.
			01GS0101	CO2 :	To Describe the basic physical principles and applications of ultrasonic sound.
			01GS0101	CO3 :	To Discuss construction, principle of optical fiber communication. Analyze the structure and properties of lasers to their performance and intended applications .
			01GS0101	CO4 :	To Utilize the concept of superconductivity, magnetic and advanced engineering materials and their behaviors under various system conditions.
			01GS0101	CO5 :	To Explain the need of NDT and its methodologies. Illustrate the properties and mechanisms of nano physics.
			01GS0101	CO6 :	To demonstrate in the laboratory the ability to collect, analyze data and to prepare coherent reports of his or her findings
			01MA0101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
			01MA0101	CO2 :	apply and solve first order differential equations to real life problems
			01MA0101	CO3 :	.Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
			01MA0101	CO4 :	Apply partial differentiation to evaluate equations of tangent plane and normal line for given surface.
			01MA0101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
			01MA0101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
			01ME0101	CO1 :	Understand basic terminologies and fundamentals of mechanical system by correlating science concept.
			01ME0101	CO2 :	Apply the governing laws of mechanical engineering to find solution of different systems.
			01ME0101	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.

<b>1617</b>	<b>CIVIL ENGINEERING</b>	<b>1</b>	01ME0101	CO4 :	Identify functional characteristics of various mechanisms.
			01ME0101	CO5 :	Analyze the various energy conversion cycles and systems.
		<b>2</b>	01EE0103	CO1 :	Recognize importance of electrical energy and its day to day applications. (Understand)
			01EE0103	CO2 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions. (Apply)
			01EE0103	CO3 :	Analyse and solve DC Circuits, AC Single phase and magnetic circuits. (Analyse)
			01EE0103	CO4 :	Explain the need of batteries, its characteristics and charging methods. (Remember/Knowledge)
			01EE0103	CO5 :	Perceive the detail understanding of construction, operation and applications of various components like Diode, BJT and Op-Amp. (Understand)
			01EE0103	CO6 :	Recognize basic electronic devices used in various circuits. (Understand)
			01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
			01EN0101	CO2 :	Know the importance of natural resources for the sustainable development of life.
			01EN0101	CO3 :	Understand the effect of growing population on the Environment.
			01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
			01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
			01MA0151	CO1 :	Explain the linear dependence of vectors of different vector space.
			01MA0151	CO2 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.
			01MA0151	CO3 :	Understand the role of multiple integral in finding volume of three dimensional objects, finding area between to two curves, finding moment of inertia etc.
			01MA0151	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
			01MA0151	CO5 :	Check the convergence and divergence of various functions which are expandable in infinite terms.
			01MA0151	CO6 :	Gain the fundamental knowledge about special function like Beta and Gamma and its applications.
			01ME0102	CO1 :	Interpret engineering drawings using fundamental technical mathematics.
			01ME0102	CO2 :	Comprehend the theory of projection.
			01ME0102	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
			01ME0102	CO4 :	To improve their technical communication skill in the form of communicative drawings
			01ME0102	CO5 :	Construct basic and intermediate geometry.
			01ME0102	CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.
			01ME0104	CO1 :	Learn about Application of hand tools and power tools.
			01ME0104	CO2 :	Learn about various operations of machine tools.
			01ME0104	CO3 :	Selection of processes and steps for specific operation
			01ME0104	CO4 :	Knowledge and awareness about various safety related operation
			01SL0101	CO1 :	After completion of this course, student will be able to comprehend texts based on science and technology.
		01SL0101	CO2 :	After completion of this course, student will be able to develop the ability to interpret informative and analytical texts.	
		01SL0101	CO3 :	After completion of this course, student will be able to evolve an understanding of components of academic writing.	
		01SL0101	CO4 :	After completion of this course, student will be able to explain technical concepts in written form.	

<b>1617</b>	<b>CIVIL ENGINEERING</b>	<b>2</b>	01SL0101	CO5 :	After completion of this course, student will be able to compose written texts for the purposes of academic writing.
		<b>3</b>	01CI0301	CO1 :	To apply fundamental principles of mechanics and equilibrium to get responses of rigid and deformable bodies
			01CI0301	CO2 :	To identify centroid, Center of Gravity, Center of Mass and moment of inertia of a simple and complex geometrical Shapes.
			01CI0301	CO3 :	To determine different types of stresses and strains developed in the Member subjected to axial, bending, shear, torsion & thermal loads.
			01CI0301	CO4 :	To analyze the determinate beam and draw its shear force and bending moment diagram.
			01CI0302	CO1 :	Interpret the technical terminologies related to planning and various conventional signs and symbols used in drawing the plans.(Understanding)
			01CI0302	CO2 :	Draw plan for building (Mass Composition, Residential, Industrial and Public) by making use of various aspects of principles of planning, architecture and as per standard bye laws. (Applying)
			01CI0302	CO3 :	Draw perspective, isometric, orthographic, cross-sectional and elevational drawing of the building by imagination. (Analyzing)
			01CI0302	CO4 :	Draw, edit and print the plan of the building by using computer application like AutoCAD. (Analyzing)
			01CI0303	CO1 :	Understand basic principles of various methods of surveying.
			01CI0303	CO2 :	Obtain the included angles, latitude and departure of the traverse lines on the field.
			01CI0303	CO3 :	Set the different types of curves on the field during survey work.
			01CI0303	CO4 :	Analyze, calculate and measure the area and volumes of the different capacities and topographical situations
			01CI0304	CO1 :	Identify the properties of different types of fluids
			01CI0304	CO2 :	Measure the pressure and hydrostatic force generated by fluid.
			01CI0304	CO3 :	Categorize various types of fluid flow through channels and conduits
			01CI0304	CO4 :	Evaluate the buoyancy force and drag-lift force for the floating and immersed bodies in fluid
			01CI0305	CO1 :	Make use of Drawing tools and command
			01CI0305	CO2 :	Construct Computer aided drawing in civil engineering project
			01CI0305	CO3 :	Examine the role of different parameter used in Software application for Civil Engineering and its benefits
			01CI0305	CO4 :	Prepare working drawings, foundation plans and other executable drawings with proper details for residential buildings, commercial and institutional buildings
			01CR0301	CO1 :	Understands how to use different tools of language in order to communicate effectively.
			01CR0301	CO2 :	Applies appropriate grammatical structures and wide range of vocabulary in spoken and written discourse in formal context.
			01CR0301	CO3 :	Choose appropriate alternatives in order to cope with personal and professional life.
			01CR0301	CO4 :	Displaying the best of the professional attitude and behavior.
			01MA0201	CO1 :	Expand Various functions in terms of sine and cosine functions
			01MA0201	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations
			01MA0201	CO3 :	Apply Laplace transform & series solution to solve differential equations.
			01MA0201	CO4 :	Apply the knowledge of differential equations and its solutions to evaluate engineering problems
		<b>4</b>	01CI0401	CO1 :	Understand the importance and application of Civil engineering materials like steel, wood etc on site
			01CI0401	CO2 :	Differentiate the construction sequence for frame and load bearing structures.
			01CI0401	CO3 :	Describe the procedure of land acquisition and documentation.



<b>1617</b>	<b>CIVIL ENGINEERING</b>	<b>4</b>	01CI0401	CO4 :	Analyze the construction process for constructing brick and stone masonry walls using different bonds.
			01CI0402	CO1 :	Classify structural systems and apply principles of statics to analyze statically determinate structures (Applying)
			01CI0402	CO2 :	To calculate stresses on structures subjected to combined axial and bending forces (Analysis)
			01CI0402	CO3 :	To compute buckling load for long columns with different end conditions using Rankine's and Euler's theory (Analysis)
			01CI0402	CO4 :	To determine stresses in thin cylinders and spherical vessels (Analysis)
			01CI0402	CO5 :	To compute strain energy stored in a body due to application of axial, shear, bending and torsional forces (Analysis)
			01CI0402	CO6 :	To develop the influence line diagram for determinate structures (Applying)
			01CI0403	CO1 :	Understand the formation of the rock and soil as well as classify them according to Indian standards.
			01CI0403	CO2 :	Identify the soil, rock and its minerals by simple filed testing and observations.
			01CI0403	CO3 :	Determine the index and engineering properties of rock and soil
			01CI0403	CO4 :	Understand the cause and effects of earthquake and volcanoes
			01CI0403	CO5 :	Analyse the project site based on geological investigation for given project.
			01CI0403	CO6 :	Understand the formation of Earth
			01CI0404	CO1 :	Conduct geodetic survey and differentiate between plane and geodetic survey methods.
			01CI0404	CO2 :	Apply various theories of errors in the routine survey works.
			01CI0404	CO3 :	Describe various methods and terminologies used in field astronomy and to locate different points on ground with respect to latitudes and longitudes.
			01CI0404	CO4 :	Conduct surveying projects by using advanced equipment such as total station and EDM.
			01CI0404	CO5 :	Interpret the remote sensing images.
			01CI0404	CO6 :	Describe various terminologies and systems used in surveys using GIS
			01CI0405	CO1 :	Identify the important ingredients of concrete and its role in influencing the behavior of concrete under different environment conditions
			01CI0405	CO2 :	Infer the results of the various experiments related to different ingredients of concrete, fresh concrete & hardened concrete
			01CI0405	CO3 :	Apply the concepts of Mix design to produce the concrete of adequate strength and durability
			01CI0405	CO4 :	Choose the correct type of concrete and concreting technology required for particular exposure and site condition
			01CI0405	CO5 :	Describe the underlying principle and interpretation of different types of the non destructive & semi destructive testing methods
			01CI0406	CO1 :	Import the Project from AutoCAD and work upon the different functional aspects of a building.
			01CI0406	CO2 :	To generate 3D view with the help of the software.
			01CI0406	CO3 :	Generate a design with Components like Furniture, Electric Fixtures etc in a building.
			01CI0406	CO4 :	Use various concepts of Building Information Modeling.
			01VE400	CO1 :	Express the basics of human values.
			01VE400	CO2 :	Articulate human values and grow as responsible human beings in the society
			01VE400	CO3 :	Develop ethical conduct and deliver their professional duties
			01VE400	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level.
		<b>5</b>	01CI0501	CO1 :	Workout Average Rainfall from a catchment

1617	CIVIL ENGINEERING	5	01CI0501	CO2 :	Measurement of evaporation, evapo-transpiration and infiltration rate using various methods
			01CI0501	CO3 :	Figure out runoff from a catchment using unit hydrograph
			01CI0501	CO4 :	Estimate highest flood flow in the river
			01CI0501	CO5 :	Compute the discharge from bore and yield of well
			01CI0501	CO6 :	Management of storm water and flood by different methods
			01CI0502	CO1 :	Analyze end actions of indeterminate structures by using Consistent deformation method, Moment Distribution method and Slope & deflection method.
			01CI0502	CO2 :	Examine the physical structural parameters using the strain energy concepts.
			01CI0502	CO3 :	Develop the influence lines for indeterminate beams that helps in evaluating end reactions, shear force and bending moment at particular section for moving load
			01CI0502	CO4 :	Analyze indeterminate structure using matrix method
			01CI0503	CO1 :	Explain the importance of highway planning and fundamentals of traffic engineering.
			01CI0503	CO2 :	Identify the different properties of pavement materials and recommend the maintenance strategies for highway design.
			01CI0503	CO3 :	Plan a highway project considering aspects such as highway finance and road safety.
			01CI0503	CO4 :	Examine the various parameters of highway geometry and structural design of pavements.
			01CI0504	CO1 :	Understand the various sources of water, standards, and criteria for designated uses.
			01CI0504	CO2 :	Design of primary, secondary, and tertiary water treatment units.
			01CI0504	CO3 :	Design of conveyance systems for water supply schemes.
			01CI0504	CO4 :	Need and design of separate and combined sewerage systems.
			01CI0504	CO5 :	Design aspects, role and functioning of various primary and secondary wastewater treatment units.
			01CI0505	CO1 :	Make use of Drawing tools and command
			01CI0505	CO2 :	Construct Computer aided drawing for nodes and links in transportation project
			01CI0505	CO3 :	Analyze various influencing traffic parameters and prioritize them according to their effects
			01CI0505	CO4 :	Predict the optimized signal cycle as per traffic condition
			01CI0506	CO1 :	Identify the engineering related problems in the community
			01CI0506	CO2 :	Analyze and Design different solutions to resolve the problems of community.
			01CI0506	CO3 :	Apply economical solution to those problems in the field.
			01CI0509	CO1 :	To analyse the properties of the traffic parameters.
			01CI0509	CO2 :	To apply knowledge of various traffic surveys
			01CI0509	CO3 :	To design various traffic control devices.
			01CI0509	CO4 :	To analyse road safety as per IRC SP 88.
		01CR0501	CO1 :	Contrast and understand short pieces of business correspondence reports or proposals. (Understanding)	
		01CR0501	CO2 :	Read and Categorize the extracts from business publications. Ask for the information required. (Analyzing)	
		01CR0501	CO3 :	Listen to, understand and contribute to discussions in meetings. (Remembering)	
		01CR0501	CO4 :	Prepare the presentation on a familiar topic. (Applying)	
6	01CI0601	CO1 :	Understand the functioning and network of air transport and rail transport.		

<b>1617</b>	<b>CIVIL ENGINEERING</b>	<b>6</b>	01CI0601	CO2 :	identify important components of rail transport and air transport.
			01CI0601	CO3 :	analyze geometric component of rail transport and air transport.
			01CI0601	CO4 :	evaluate geometric design of various components of air transport and rail transport.
			01CI0602	CO1 :	To understand various philosophies for structural design
			01CI0602	CO2 :	To analyse and design various types of steel connection using bolts and weld.
			01CI0602	CO3 :	To design steel structural elements in accordance to IS 800
			01CI0602	CO4 :	To ensure limit state of collapse and serviceability for structural elements
			01CI0602	CO5 :	To design RCC flexural elements in accordance to IS 456
			01CI0602	CO6 :	To design column and footing subjected to axial loads according to IS 456.
			01CI0603	CO1 :	To evaluate to predict the stresses incurred on the soil due to overlaying of foundations.
			01CI0603	CO2 :	The process of compaction and its engineering performance in the field can be clearly understood
			01CI0603	CO3 :	Predict stability of the slop and Design of slopes that are required in the construction of embankment, earth dams and canals can be successfully applied
			01CI0603	CO4 :	To able to understand the phenomena of consolidation and able to calculate the settlement of foundation
			01CI0603	CO5 :	Able to calculate strength, compresibility and permeability parameters of soil as per relevant IS code and phenomena of earth pressure.
			01CI0603	CO6 :	Able to understand various engineering properties of soil
			01CI0604	CO1 :	To work out the amount of material required for various activities of the construction of infrastructural facilities
			01CI0604	CO2 :	To acquaint the students with types of contract and contracting terminologies involved in the projects, disputes and arbitration process.
			01CI0604	CO3 :	To drafting general specifications for civil works
			01CI0604	CO4 :	To Carry out the Bidding Process and Tendering Process.
			01CI0604	CO5 :	To illustrate the rate analysis and Valuation Process
			01CI0605	CO1 :	To identify the use and applicability of different types of equipment
			01CI0605	CO2 :	To analyze different types of deep foundation and its construction techniques
			01CI0605	CO3 :	To apply various techniques used in the construction of tall structure
			01CI0605	CO4 :	To apply the safety measures required on the construction site
			01CI0605	CO5 :	To differentiate various techniques used in the demolition of the structure
			01CI0605	CO6 :	To analyze different design parameters of the temporary structure
			01CI0606	CO1 :	Understand the modelling of various types of structures in STAAD PRO and ETABS.
			01CI0606	CO2 :	Apply the various types of loads to structures using STAAD PRO and ETABS.
			01CI0606	CO3 :	Analyze the concrete and steel structures using STAAD PRO and ETABS.
			01CI0606	CO4 :	Design the concrete and steel structures using STAAD PRO and ETABS.
			01CI0607	CO1 :	Identify the engineering related problems in the community
			01CI0607	CO2 :	Analyze and Design different solutions to resolve the problems of community.
			01CI0607	CO3 :	Apply economical solution to those problems in the field.
			01CI0608	CO1 :	List and generally explain the main sources of energy and their primary applications nationally and internationally
			01CI0608	CO2 :	Demonstrate the challenges and problems associated with the use of various energy sources, including fossil fuels, with regard to future supply and the impact on the environment

<b>1617</b>	<b>CIVIL ENGINEERING</b>	<b>6</b>	01CI0608	CO3 :	Understand effect of using these sources on the environment and climate
			01CI0608	CO4 :	Understand the Engineering involved in project compare energy demands and quantity of the resources.
			01CI0608	CO5 :	Collect and organize information on renewable energy technologies as a basis for further analysis and evaluation.
			01CI0608	CO6 :	To quantify energy demands and make comparisons among energy uses, resources, and technologies.
		<b>7</b>	01CI0701	CO1 :	Calculate various types loads acting on different RCC structures as per various Indian standards.
			01CI0701	CO2 :	Design a multistorey RCC structure as per Indian standards.
			01CI0701	CO3 :	Apply the fundamentals of reinforced concrete to design structures like retaining walls, water tanks and flat slab.
			01CI0701	CO4 :	Analyze the structures considering the effects of earthquake force as per Indian standards.
			01CI0702	CO1 :	Calculate irrigation water requirement of crops
			01CI0702	CO2 :	Calculate the pressure at key points of sheet piles and floor thickness for a weir/barrage using Bligh's and khosla's theory
			01CI0702	CO3 :	Causes of failure of earthen dam and Calculate forces acting on gravity dam
			01CI0702	CO4 :	Design of the lined and unlined canal
			01CI0702	CO5 :	Understand the function of hydraulic structure of irrigation system
			01CI0703	CO1 :	To Understand the importance of quality, safety, equipments, material and account management in a Construction project.
			01CI0703	CO2 :	Create and analyze the Bar Chart, Milestone Chart and Network Diagrams by dividing project tasks into activities and events.
			01CI0703	CO3 :	Estimate the project duration, Resource allocation and Cost Optimization by CPM and PERT Methods.
			01CI0703	CO4 :	Analyze the project Organization,scheduling and Cost optimization
			01CI0704	CO1 :	Apply application of the theoretical knowledge to solve industrial/social problem.
			01CI0704	CO2 :	Understand, analyze and solve Medium/Large scale engineering field problems
			01CI0704	CO3 :	Demonstrate teamwork and leadership qualities.
			01CI0704	CO4 :	Design a solution with professional and ethical conduct as per field expectations
			01CI0705	CO1 :	Apply the concept of seismology and liquefaction for preparedness against earthquake.
			01CI0705	CO2 :	Calculate response of Single and Multi Degree of Freedom system.
			01CI0705	CO3 :	Analyze earthquake resistant building with considering lateral load according to IS: 1893-2016.
			01CI0705	CO4 :	Examine ductile detailing of structural drawings according to IS: 13920 – 2016.
			01CI0707	CO1 :	Implement the concept of urban transportation system planning process and land use planning for urban goods movement.
			01CI0707	CO2 :	Analyze the four stage transportation planning process.
			01CI0707	CO3 :	Solve the urban transport model for urban system planning.
		01CI0707	CO4 :	Sketch the comprehensive plan and transportation system management planning by focusing on different urban transit problems.	
		<b>8</b>	01CI0801	CO1 :	Select appropriate soil investigation/testing technique/method and get true sub soil parameters used for selection of type of foundation as per codal guidelines.
			01CI0801	CO2 :	Select and design appropriate/suitable foundation system (shallow) for different structures, that satisfy the allowable bearing capacity and settlement requirements based on soil properties
			01CI0801	CO3 :	Design deep foundation satisfying bearing capacity and settlement requirements
01CI0801	CO4 :		Understand the engineering behavior of expansive soils and selection of suitable foundation type for such soils, Selection of alternate materials like geosynthetics and its application in foundation problems.		

<b>1617</b>	<b>CIVIL ENGINEERING</b>	<b>8</b>	01CI0801	CO5 :	Design and analysis of retaining walls and sheet piles under static loads
			01CI0802	CO1 :	Produce structural layout of Industrial steel structures, plate girder, foot-over bridge.
			01CI0802	CO2 :	Evaluate the loads acting on steel structures and identify the typical failure modes.
			01CI0802	CO3 :	Apply the principles, procedures and current Indian codal provisions to the analysis and design of Industrial structures, plate girder & foot-over bridges.
			01CI0802	CO4 :	Apply the principles of plastic design in steel beams & portal frames.
			01CI0803	CO1 :	Apply the theoretical knowledge to solve industrial/social problem.
			01CI0803	CO2 :	Understand, analyze and solve Medium/Large scale engineering field problems
			01CI0803	CO3 :	Demonstrate teamwork and leadership qualities.
			01CI0803	CO4 :	Design a solution with sustainability and professional ethical conduct as per field expectations
			01CI0805	CO1 :	To identify type of distress in deteriorated concrete structure.
			01CI0805	CO2 :	To estimate the extent of damage level in concrete structures using Non Destructive Tests
			01CI0805	CO3 :	To implement various rehabilitation and retrofitting techniques using various innovative materials in structures.
			01CI0805	CO4 :	To understand usefulness of various structural health monitoring methods and its applications in maintenance of structures.
			01CI0810	CO1 :	Develop infrastructure master plan and Schedule infrastructure project activities.
			01CI0810	CO2 :	Prepare project development plan for infrastructure organizations and systems.
			01CI0810	CO3 :	Prepare tender documents for infrastructure project by understanding different engineering contracts.
			01CI0810	CO4 :	Apply the management techniques like CPM and PERT to infrastructure projects.
			01CI0810	CO5 :	Analyze the management process for infrastructure projects.

**Course Outcome**  
**Batch**  
**(2017-21)**  
**B.Tech. in Civil Engineering**

Batch	Stream	Sem	Subject Code	Sr No	Course Out Comes
1617	CIVIL ENGINEERING	1	01CE0101	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
			01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
			01CE0101	CO3 :	Express and Distinguish various loops in C language (Analyze).
			01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures (Apply)
			01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
			01CE0101	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
			01CI0101	CO1 :	Recognize importance of Civil engineering and its day to day applications.
			01CI0101	CO2 :	Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
			01CI0101	CO3 :	Describe qualitative comparison between different materials and its selection.
			01CI0101	CO4 :	Analyse the water resources, its harvesting and its consumptive use.
			01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
			01CI0101	CO6 :	Acquaint with the various modes of transportation.
			01CR0101	CO1 :	Understands how to use different tools of language in order to communicate effectively.
			01CR0101	CO2 :	Applies appropriate grammatical structures and a wide range of vocabulary in spoken and written discourse.
			01CR0101	CO3 :	Choose appropriate alternatives in personal and professional life.
			01CR0101	CO4 :	Displaying the best of the professional attitude and behavior.
			01GS0101	CO1 :	To Interpret the mechanics of various types of sound waves -what they look like, how they are produced, interact with other sound waves and materials.
			01GS0101	CO2 :	To Describe the basic physical principles and applications of ultrasonic sound.
			01GS0101	CO3 :	To Discuss construction, principle of optical fiber communication. Analyze the structure and properties of lasers to their performance and intended applications .
			01GS0101	CO4 :	To Utilize the concept of superconductivity, magnetic and advanced engineering materials and their behaviors under various system conditions.
			01GS0101	CO5 :	To Explain the need of NDT and its methodologies. Illustrate the properties and mechanisms of nano physics.
			01GS0101	CO6 :	To demonstrate in the laboratory the ability to collect, analyze data and to prepare coherent reports of his or her findings
			01MA0101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
			01MA0101	CO2 :	apply and solve first order differential equations to real life problems
			01MA0101	CO3 :	.Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
			01MA0101	CO4 :	Apply partial differentiation to evaluate equations of tangent plane and normal line for given surface.
			01MA0101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
			01MA0101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
			01ME0101	CO1 :	Understand basic terminologies and fundamentals of mechanical system by correlating science concept.
			01ME0101	CO2 :	Apply the governing laws of mechanical engineering to find solution of different systems.
			01ME0101	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.

<b>1617</b>	<b>CIVIL ENGINEERING</b>	<b>1</b>	01ME0101	CO4 :	Identify functional characteristics of various mechanisms.
			01ME0101	CO5 :	Analyze the various energy conversion cycles and systems.
		<b>2</b>	01EE0103	CO1 :	Recognize importance of electrical energy and its day to day applications. (Understand)
			01EE0103	CO2 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions. (Apply)
			01EE0103	CO3 :	Analyse and solve DC Circuits, AC Single phase and magnetic circuits. (Analyse)
			01EE0103	CO4 :	Explain the need of batteries, its characteristics and charging methods. (Remember/Knowledge)
			01EE0103	CO5 :	Perceive the detail understanding of construction, operation and applications of various components like Diode, BJT and Op-Amp. (Understand)
			01EE0103	CO6 :	Recognize basic electronic devices used in various circuits. (Understand)
			01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
			01EN0101	CO2 :	Know the importance of natural resources for the sustainable development of life.
			01EN0101	CO3 :	Understand the effect of growing population on the Environment.
			01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
			01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
			01MA0151	CO1 :	Explain the linear dependence of vectors of different vector space.
			01MA0151	CO2 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.
			01MA0151	CO3 :	Understand the role of multiple integral in finding volume of three dimensional objects, finding area between to two curves, finding moment of inertia etc.
			01MA0151	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
			01MA0151	CO5 :	Check the convergence and divergence of various functions which are expandable in infinite terms.
			01MA0151	CO6 :	Gain the fundamental knowledge about special function like Beta and Gamma and its applications.
			01ME0102	CO1 :	Interpret engineering drawings using fundamental technical mathematics.
			01ME0102	CO2 :	Comprehend the theory of projection.
			01ME0102	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
			01ME0102	CO4 :	To improve their technical communication skill in the form of communicative drawings
			01ME0102	CO5 :	Construct basic and intermediate geometry.
			01ME0102	CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.
			01ME0104	CO1 :	Learn about Application of hand tools and power tools.
			01ME0104	CO2 :	Learn about various operations of machine tools.
			01ME0104	CO3 :	Selection of processes and steps for specific operation
			01ME0104	CO4 :	Knowledge and awareness about various safety related operation
			01SL0101	CO1 :	After completion of this course, student will be able to comprehend texts based on science and technology.
		01SL0101	CO2 :	After completion of this course, student will be able to develop the ability to interpret informative and analytical texts.	
		01SL0101	CO3 :	After completion of this course, student will be able to evolve an understanding of components of academic writing.	
		01SL0101	CO4 :	After completion of this course, student will be able to explain technical concepts in written form.	



1617	CIVIL ENGINEERING	2	01SL0101	CO5 :	After completion of this course, student will be able to compose written texts for the purposes of academic writing.	
		3	01CI0301	CO1 :	To apply fundamental principles of mechanics and equilibrium to get responses of rigid and deformable bodies	
			01CI0301	CO2 :	To identify centroid, Center of Gravity, Center of Mass and moment of inertia of a simple and complex geometrical Shapes.	
			01CI0301	CO3 :	To determine different types of stresses and strains developed in the Member subjected to axial, bending, shear, torsion & thermal loads.	
			01CI0301	CO4 :	To analyze the determinate beam and draw its shear force and bending moment diagram.	
			01CI0302	CO1 :	Interpret the technical terminologies related to planning and various conventional signs and symbols used in drawing the plans.(Understanding)	
			01CI0302	CO2 :	Draw plan for building (Mass Composition, Residential, Industrial and Public) by making use of various aspects of principles of planning, architecture and as per standard bye laws. (Applying)	
			01CI0302	CO3 :	Draw perspective, isometric, orthographic, cross-sectional and elevational drawing of the building by imagination. (Analyzing)	
			01CI0302	CO4 :	Draw, edit and print the plan of the building by using computer application like AutoCAD. (Analyzing)	
			01CI0303	CO1 :	Understand basic principles of various methods of surveying.	
			01CI0303	CO2 :	Obtain the included angles, latitude and departure of the traverse lines on the field.	
			01CI0303	CO3 :	Set the different types of curves on the field during survey work.	
			01CI0303	CO4 :	Analyze, calculate and measure the area and volumes of the different capacities and topographical situations	
			01CI0304	CO1 :	Identify the properties of different types of fluids	
			01CI0304	CO2 :	Measure the pressure and hydrostatic force generated by fluid.	
			01CI0304	CO3 :	Categorize various types of fluid flow through channels and conduits	
			01CI0304	CO4 :	Evaluate the buoyancy force and drag-lift force for the floating and immersed bodies in fluid	
			01CI0305	CO1 :	Make use of Drawing tools and command	
			01CI0305	CO2 :	Construct Computer aided drawing in civil engineering project	
			01CI0305	CO3 :	Examine the role of different parameter used in Software application for Civil Engineering and its benefits	
			01CI0305	CO4 :	Prepare working drawings, foundation plans and other executable drawings with proper details for residential buildings, commercial and institutional buildings	
			01CR0301	CO1 :	Understands how to use different tools of language in order to communicate effectively.	
			01CR0301	CO2 :	Applies appropriate grammatical structures and wide range of vocabulary in spoken and written discourse in formal context.	
			01CR0301	CO3 :	Choose appropriate alternatives in order to cope with personal and professional life.	
			01CR0301	CO4 :	Displaying the best of the professional attitude and behavior.	
			01MA0201	CO1 :	Expand Various functions in terms of sine and cosine functions	
			01MA0201	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations	
			01MA0201	CO3 :	Apply Laplace transform & series solution to solve differential equations.	
			01MA0201	CO4 :	Apply the knowledge of differential equations and its solutions to evaluate engineering problems	
			4	01CI0401	CO1 :	Understand the importance and application of Civil engineering materials like steel, wood etc on site
				01CI0401	CO2 :	Differentiate the construction sequence for frame and load bearing structures.
				01CI0401	CO3 :	Describe the procedure of land acquisition and documentation.

<b>1617</b>	<b>CIVIL ENGINEERING</b>	<b>4</b>	01CI0401	CO4 :	Analyze the construction process for constructing brick and stone masonry walls using different bonds.
			01CI0402	CO1 :	Classify structural systems and apply principles of statics to analyze statically determinate structures (Applying)
			01CI0402	CO2 :	To calculate stresses on structures subjected to combined axial and bending forces (Analysis)
			01CI0402	CO3 :	To compute buckling load for long columns with different end conditions using Rankine's and Euler's theory (Analysis)
			01CI0402	CO4 :	To determine stresses in thin cylinders and spherical vessels (Analysis)
			01CI0402	CO5 :	To compute strain energy stored in a body due to application of axial, shear, bending and torsional forces (Analysis)
			01CI0402	CO6 :	To develop the influence line diagram for determinate structures (Applying)
			01CI0403	CO1 :	Understand the formation of the rock and soil as well as classify them according to Indian standards.
			01CI0403	CO2 :	Identify the soil, rock and its minerals by simple field testing and observations.
			01CI0403	CO3 :	Determine the index and engineering properties of rock and soil
			01CI0403	CO4 :	Understand the cause and effects of earthquake and volcanoes
			01CI0403	CO5 :	Analyse the project site based on geological investigation for given project.
			01CI0403	CO6 :	Understand the formation of Earth
			01CI0404	CO1 :	Conduct geodetic survey and differentiate between plane and geodetic survey methods.
			01CI0404	CO2 :	Apply various theories of errors in the routine survey works.
			01CI0404	CO3 :	Describe various methods and terminologies used in field astronomy and to locate different points on ground with respect to latitudes and longitudes.
			01CI0404	CO4 :	Conduct surveying projects by using advanced equipment such as total station and EDM.
			01CI0404	CO5 :	Interpret the remote sensing images.
			01CI0404	CO6 :	Describe various terminologies and systems used in surveys using GIS
			01CI0405	CO1 :	Identify the important ingredients of concrete and its role in influencing the behavior of concrete under different environment conditions
			01CI0405	CO2 :	Infer the results of the various experiments related to different ingredients of concrete, fresh concrete & hardened concrete
			01CI0405	CO3 :	Apply the concepts of Mix design to produce the concrete of adequate strength and durability
			01CI0405	CO4 :	Choose the correct type of concrete and concreting technology required for particular exposure and site condition
			01CI0405	CO5 :	Describe the underlying principle and interpretation of different types of the non destructive & semi destructive testing methods
			01CI0406	CO1 :	Import the Project from AutoCAD and work upon the different functional aspects of a building.
			01CI0406	CO2 :	To generate 3D view with the help of the software.
			01CI0406	CO3 :	Generate a design with Components like Furniture, Electric Fixtures etc in a building.
			01CI0406	CO4 :	Use various concepts of Building Information Modeling.
			01VE400	CO1 :	Express the basics of human values.
			01VE400	CO2 :	Articulate human values and grow as responsible human beings in the society
			01VE400	CO3 :	Develop ethical conduct and deliver their professional duties
			01VE400	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level.
		<b>5</b>	01CI0501	CO1 :	Workout Average Rainfall from a catchment

1617	CIVIL ENGINEERING	5	01CI0501	CO2 :	Measurement of evaporation, evapo-transpiration and infiltration rate using various methods
			01CI0501	CO3 :	Figure out runoff from a catchment using unit hydrograph
			01CI0501	CO4 :	Estimate highest flood flow in the river
			01CI0501	CO5 :	Compute the discharge from bore and yield of well
			01CI0501	CO6 :	Management of storm water and flood by different methods
			01CI0502	CO1 :	Analyze end actions of indeterminate structures by using Consistent deformation method, Moment Distribution method and Slope & deflection method.
			01CI0502	CO2 :	Examine the physical structural parameters using the strain energy concepts.
			01CI0502	CO3 :	Develop the influence lines for indeterminate beams that helps in evaluating end reactions, shear force and bending moment at particular section for moving load
			01CI0502	CO4 :	Analyze indeterminate structure using matrix method
			01CI0503	CO1 :	Explain the importance of highway planning and fundamentals of traffic engineering.
			01CI0503	CO2 :	Identify the different properties of pavement materials and recommend the maintenance strategies for highway design.
			01CI0503	CO3 :	Plan a highway project considering aspects such as highway finance and road safety.
			01CI0503	CO4 :	Examine the various parameters of highway geometry and structural design of pavements.
			01CI0504	CO1 :	Understand the various sources of water, standards, and criteria for designated uses.
			01CI0504	CO2 :	Design of primary, secondary, and tertiary water treatment units.
			01CI0504	CO3 :	Design of conveyance systems for water supply schemes.
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			01CI0509	CO2 :	To apply knowledge of various traffic surveys
			01CI0509	CO3 :	To design various traffic control devices.
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6	01CI0601	CO1 :	Understand the functioning and network of air transport and rail transport.		

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			01CI0602	CO2 :	To analyse and design various types of steel connection using bolts and weld.
			01CI0602	CO3 :	To design steel structural elements in accordance to IS 800
			01CI0602	CO4 :	To ensure limit state of collapse and serviceability for structural elements
			01CI0602	CO5 :	To design RCC flexural elements in accordance to IS 456
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			01CI0603	CO3 :	Predict stability of the slop and Design of slopes that are required in the construction of embankment, earth dams and canals can be successfully applied
			01CI0603	CO4 :	To able to understand the phenomena of consolidation and able to calculate the settlement of foundation
			01CI0603	CO5 :	Able to calculate strength, compresibility and permeability parameters of soil as per relevant IS code and phenomena of earth pressure.
			01CI0603	CO6 :	Able to understand various engineering properties of soil
			01CI0604	CO1 :	To work out the amount of material required for various activities of the construction of infrastructural facilities
			01CI0604	CO2 :	To acquaint the students with types of contract and contracting terminologies involved in the projects, disputes and arbitration process.
			01CI0604	CO3 :	To drafting general specifications for civil works
			01CI0604	CO4 :	To Carry out the Bidding Process and Tendering Process.
			01CI0604	CO5 :	To illustrate the rate analysis and Valuation Process
			01CI0605	CO1 :	To identify the use and applicability of different types of equipment
			01CI0605	CO2 :	To analyze different types of deep foundation and its construction techniques
			01CI0605	CO3 :	To apply various techniques used in the construction of tall structure
			01CI0605	CO4 :	To apply the safety measures required on the construction site
			01CI0605	CO5 :	To differentiate various techniques used in the demolition of the structure
			01CI0605	CO6 :	To analyze different design parameters of the temporary structure
			01CI0606	CO1 :	Understand the modelling of various types of structures in STAAD PRO and ETABS.
			01CI0606	CO2 :	Apply the various types of loads to structures using STAAD PRO and ETABS.
			01CI0606	CO3 :	Analyze the concrete and steel structures using STAAD PRO and ETABS.
			01CI0606	CO4 :	Design the concrete and steel structures using STAAD PRO and ETABS.
			01CI0607	CO1 :	Identify the engineering related problems in the community
			01CI0607	CO2 :	Analyze and Design different solutions to resolve the problems of community.
			01CI0607	CO3 :	Apply economical solution to those problems in the field.
			01CI0608	CO1 :	List and generally explain the main sources of energy and their primary applications nationally and internationally
			01CI0608	CO2 :	Demonstrate the challenges and problems associated with the use of various energy sources, including fossil fuels, with regard to future supply and the impact on the environment

<b>1617</b>	<b>CIVIL ENGINEERING</b>	<b>6</b>	01CI0608	CO3 :	Understand effect of using these sources on the environment and climate	
			01CI0608	CO4 :	Understand the Engineering involved in project compare energy demands and quantity of the resources.	
			01CI0608	CO5 :	Collect and organize information on renewable energy technologies as a basis for further analysis and evaluation.	
			01CI0608	CO6 :	To quantify energy demands and make comparisons among energy uses, resources, and technologies.	
		<b>7</b>	01CI0701	CO1 :	Calculate various types loads acting on different RCC structures as per various Indian standards.	
			01CI0701	CO2 :	Design a multistorey RCC structure as per Indian standards.	
			01CI0701	CO3 :	Apply the fundamentals of reinforced concrete to design structures like retaining walls, water tanks and flat slab.	
			01CI0701	CO4 :	Analyze the structures considering the effects of earthquake force as per Indian standards.	
			01CI0702	CO1 :	Calculate irrigation water requirement of crops	
			01CI0702	CO2 :	Calculate the pressure at key points of sheet piles and floor thickness for a weir/barrage using Bligh's and khosla's theory	
			01CI0702	CO3 :	Causes of failure of earthen dam and Calculate forces acting on gravity dam	
			01CI0702	CO4 :	Design of the lined and unlined canal	
			01CI0702	CO5 :	Understand the function of hydraulic structure of irrigation system	
			01CI0703	CO1 :	To Understand the importance of quality, safety, equipments, material and account management in a Construction project.	
			01CI0703	CO2 :	Create and analyze the Bar Chart, Milestone Chart and Network Diagrams by dividing project tasks into activities and events.	
			01CI0703	CO3 :	Estimate the project duration, Resource allocation and Cost Optimization by CPM and PERT Methods.	
			01CI0703	CO4 :	Analyze the project Organization,scheduling and Cost optimization	
			01CI0704	CO1 :	Apply application of the theoretical knowledge to solve industrial/social problem.	
			01CI0704	CO2 :	Understand, analyze and solve Medium/Large scale engineering field problems	
			01CI0704	CO3 :	Demonstrate teamwork and leadership qualities.	
			01CI0704	CO4 :	Design a solution with professional and ethical conduct as per field expectations	
			01CI0705	CO1 :	Apply the concept of seismology and liquefaction for preparedness against earthquake.	
			01CI0705	CO2 :	Calculate response of Single and Multi Degree of Freedom system.	
			01CI0705	CO3 :	Analyze earthquake resistant building with considering lateral load according to IS: 1893-2016.	
			01CI0705	CO4 :	Examine ductile detailing of structural drawings according to IS: 13920 – 2016.	
			01CI0707	CO1 :	Implement the concept of urban transportation system planning process and land use planning for urban goods movement.	
			01CI0707	CO2 :	Analyze the four stage transportation planning process.	
			01CI0707	CO3 :	Solve the urban transport model for urban system planning.	
			01CI0707	CO4 :	Sketch the comprehensive plan and transportation system management planning by focusing on different urban transit problems.	
			<b>8</b>	01CI0801	CO1 :	Select appropriate soil investigation/testing technique/method and get true sub soil parameters used for selection of type of foundation as per codal guidelines.
				01CI0801	CO2 :	Select and design appropriate/suitable foundation system (shallow) for different structures, that satisfy the allowable bearing capacity and settlement requirements based on soil properties
				01CI0801	CO3 :	Design deep foundation satisfying bearing capacity and settlement requirements
		01CI0801		CO4 :	Understand the engineering behavior of expansive soils and selection of suitable foundation type for such soils, Selection of alternate materials like geosynthetics and its application in foundation problems.	

<b>1617</b>	<b>CIVIL ENGINEERING</b>	<b>8</b>	01CI0801	CO5 :	Design and analysis of retaining walls and sheet piles under static loads
			01CI0802	CO1 :	Produce structural layout of Industrial steel structures, plate girder, foot-over bridge.
			01CI0802	CO2 :	Evaluate the loads acting on steel structures and identify the typical failure modes.
			01CI0802	CO3 :	Apply the principles, procedures and current Indian codal provisions to the analysis and design of Industrial structures, plate girder & foot-over bridges.
			01CI0802	CO4 :	Apply the principles of plastic design in steel beams & portal frames.
			01CI0803	CO1 :	Apply the theoretical knowledge to solve industrial/social problem.
			01CI0803	CO2 :	Understand, analyze and solve Medium/Large scale engineering field problems
			01CI0803	CO3 :	Demonstrate teamwork and leadership qualities.
			01CI0803	CO4 :	Design a solution with sustainability and professional ethical conduct as per field expectations
			01CI0805	CO1 :	To identify type of distress in deteriorated concrete structure.
			01CI0805	CO2 :	To estimate the extent of damage level in concrete structures using Non Destructive Tests
			01CI0805	CO3 :	To implement various rehabilitation and retrofitting techniques using various innovative materials in structures.
			01CI0805	CO4 :	To understand usefulness of various structural health monitoring methods and its applications in maintenance of structures.
			01CI0810	CO1 :	Develop infrastructure master plan and Schedule infrastructure project activities.
			01CI0810	CO2 :	Prepare project development plan for infrastructure organizations and systems.
			01CI0810	CO3 :	Prepare tender documents for infrastructure project by understanding different engineering contracts.
			01CI0810	CO4 :	Apply the management techniques like CPM and PERT to infrastructure projects.
			01CI0810	CO5 :	Analyze the management process for infrastructure projects.

**Course Outcome**  
**Batch**  
**(2018-22)**  
**B.Tech. in Civil Engineering**

Batch	Stream	Sem	Subject Code	Sr No	Course Out Comes
1819	CIVIL ENGINEERING	1	01CI0101	CO1 :	Recognize importance of Civil engineering and its day to day applications.
			01CI0101	CO2 :	Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
			01CI0101	CO3 :	Describe qualitative comparison between different materials and its selection.
			01CI0101	CO4 :	Analyse the water resources, its harvesting and its consumptive use.
			01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
			01CI0101	CO6 :	Acquaint with the various modes of transportation.
			01CR0103	CO1 :	Understand importance of role of Values in developing self
			01CR0103	CO2 :	Inculcate right values, ethics, attitudes, manners and behaviours for life
			01CR0103	CO3 :	Respond and relate with expectations, competitions and power of networking
			01CR0103	CO4 :	Apply the values in order to live a positive, healthy and productive life.
			01CR0103	CO5 :	Understand the significance of having appropriate attitude and balance towards work life as well as personal life.
			01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
			01EN0101	CO2 :	Know the importance of natural resources for the sustainable development of life.
			01EN0101	CO3 :	Understand the effect of growing population on the Environment.
			01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
			01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
			01GS0101	CO1 :	To Interpret the mechanics of various types of sound waves -what they look like, how they are produced, interact with other sound waves and materials.
			01GS0101	CO2 :	To Describe the basic physical principles and applications of ultrasonic sound.
			01GS0101	CO3 :	To Discuss construction, principle of optical fiber communication. Analyze the structure and properties of lasers to their performance and intended applications .
			01GS0101	CO4 :	To Utilize the concept of superconductivity, magnetic and advanced engineering materials and their behaviors under various system conditions.
			01GS0101	CO5 :	To Explain the need of NDT and its methodologies. Illustrate the properties and mechanisms of nano physics.
			01GS0101	CO6 :	To demonstrate in the laboratory the ability to collect, analyze data and to prepare coherent reports of his or her findings
			01MA1101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
			01MA1101	CO2 :	Apply and solve first order differential equations to real life problems
			01MA1101	CO3 :	Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
			01MA1101	CO4 :	Apply Multiple Integral to evaluate the Surface Area and Volume of any 3D objects.
			01MA1101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
			01MA1101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
			01ME0101	CO1 :	Understand basic terminologies and fundamentals of mechanical system by correlating science concept.
			01ME0101	CO2 :	Apply the governing laws of mechanical engineering to find solution of different systems.
			01ME0101	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.
			01ME0101	CO4 :	Identify functional characteristics of various mechanisms.



<b>1819</b>	<b>CIVIL ENGINEERING</b>	<b>1</b>	01ME0101	CO5 :	Analyze the various energy conversion cycles and systems.
			01SL0102	CO0 :	To enhance reading skills for academic purposes.
			01SL0102	CO1 :	To enhance reading skills for academic purposes
			01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes
			01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
			01SL0102	CO4 :	To express their ideas in formal, academic written form
			01SL0103	CO1 :	Develop speaking competence for academic purpose
			01SL0103	CO2 :	Speak on a given topic in the context of technology
			01SL0103	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements
			01SL0103	CO4 :	Enhance the ability to make a presentation on a given topic
		<b>2</b>	01CE0101	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
			01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
			01CE0101	CO3 :	Express and Distinguish various loops in C language (Analyze).
			01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures (Apply)
			01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
			01CE0101	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
			01EE0103	CO1 :	Recognize importance of electrical energy and its day to day applications. (Understand)
			01EE0103	CO2 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions. (Apply)
			01EE0103	CO3 :	Analyse and solve DC Circuits, AC Single phase and magnetic circuits. (Analyse)
			01EE0103	CO4 :	Explain the need of batteries, its characteristics and charging methods. (Remember/Knowledge)
			01EE0103	CO5 :	Perceive the detail understanding of construction, operation and applications of various components like Diode, BJT and Op-Amp. (Understand)
			01EE0103	CO6 :	Recognize basic electronic devices used in various circuits. (Understand)
			01MA1151	CO1 :	Explain the linear dependence of vectors of different vector space.
			01MA1151	CO2 :	Apply the concept of Eigen values and vectors in various field of engineering like control theory, vibration analysis, quantum mechanics etc
			01MA1151	CO3 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.
			01MA1151	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
			01MA1151	CO5 :	Determine convergence of improper integrals and explain special functions like Beta, Gama and error functions.
			01MA1151	CO6 :	Apply Gauss elimination to solve linear system of equations
			01ME0102	CO1 :	Interpret engineering drawings using fundamental technical mathematics.
			01ME0102	CO2 :	Comprehend the theory of projection.
			01ME0102	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
			01ME0102	CO4 :	To improve their technical communication skill in the form of communicative drawings
01ME0102	CO5 :	Construct basic and intermediate geometry.			
01ME0102	CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.			

1819	CIVIL ENGINEERING	2	01ME0104	CO1 :	Learn about Application of hand tools and power tools.
			01ME0104	CO2 :	Learn about various operations of machine tools.
			01ME0104	CO3 :	Selection of processes and steps for specific operation
			01ME0104	CO4 :	Knowledge and awareness about various safety related operation
		3	01CI0301	CO1 :	To apply fundamental principles of mechanics and equilibrium to get responses of rigid and deformable bodies
			01CI0301	CO2 :	To identify centroid, Center of Gravity, Center of Mass and moment of inertia of a simple and complex geometrical Shapes.
			01CI0301	CO3 :	To determine different types of stresses and strains developed in the Member subjected to axial, bending, shear, torsion & thermal loads.
			01CI0301	CO4 :	To analyze the determinate beam and draw its shear force and bending moment diagram.
			01CI0302	CO1 :	Interpret the technical terminologies related to planning and various conventional signs and symbols used in drawing the plans.(Understanding)
			01CI0302	CO2 :	Draw plan for building (Mass Composition, Residential, Industrial and Public) by making use of various aspects of principles of planning, architecture and as per standard bye laws. (Applying)
			01CI0302	CO3 :	Draw perspective, isometric, orthographic, cross-sectional and elevational drawing of the building by imagination. (Analyzing)
			01CI0302	CO4 :	Draw, edit and print the plan of the building by using computer application like AutoCAD. (Analyzing)
			01CI0303	CO1 :	Understand basic principles of various methods of surveying.
			01CI0303	CO2 :	Obtain the included angles, latitude and departure of the traverse lines on the field.
			01CI0303	CO3 :	Set the different types of curves on the field during survey work.
			01CI0303	CO4 :	Analyze, calculate and measure the area and volumes of the different capacities and topographical situations
			01CI0304	CO1 :	Identify the properties of different types of fluids
			01CI0304	CO2 :	Measure the pressure and hydrostatic force generated by fluid.
			01CI0304	CO3 :	Categorize various types of fluid flow through channels and conduits
			01CI0304	CO4 :	Evaluate the buoyancy force and drag-lift force for the floating and immersed bodies in fluid
			01CI0305	CO1 :	Make use of Drawing tools and command
			01CI0305	CO2 :	Construct Computer aided drawing in civil engineering project
			01CI0305	CO3 :	Examine the role of different parameter used in Software application for Civil Engineering and its benefits
			01CI0305	CO4 :	Prepare working drawings, foundation plans and other executable drawings with proper details for residential buildings, commercial and institutional buildings
			01CI0306	CO1 :	Identify the engineering related problems in the community
			01CI0306	CO2 :	Compare the different solutions to resolve the problems of community by case study and survey.
			01CI0306	CO3 :	Analyze and solve the issue of community by providing economical solution to the problem
			01MA0301	CO1 :	Expand Various functions in terms of sine and cosine functions
			01MA0301	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations
			01MA0301	CO3 :	Apply Laplace transform & series solution to solve differential equations.
			01MA0301	CO4 :	Apply the knowledge of differential equations and its solutions to evaluate engineering problems
			4	01CI0402	CO1 :
		01CI0402		CO2 :	To calculate stresses on structures subjected to combined axial and bending forces (Analysis)

1819	CIVIL ENGINEERING	4	01CI0402	CO3 :	To compute buckling load for long columns with different end conditions using Rankine's and Euler's theory (Analysis)	
			01CI0402	CO4 :	To determine stresses in thin cylinders and spherical vessels (Analysis)	
			01CI0402	CO5 :	To compute strain energy stored in a body due to application of axial, shear, bending and torsional forces (Analysis)	
			01CI0402	CO6 :	To develop the influence line diagram for determinate structures (Applying)	
			01CI0407	CO1 :	Understand the importance of civil engineering knowledge to solve real life issues in community.	
			01CI0407	CO2 :	Analyze and solve the issue of community solvable by providing economical solution to the problem	
			01CI0407	CO3 :	Build strong personal skills and learn how to take key decisions about projects.	
			01CI1401	CO1 :	Students will be able to understand features of special concrete and concreting methods	
			01CI1401	CO2 :	Analyze the engineering properties of Civil Engineering materials like aggregate, cement, concrete, steel, wood, plastic, paints and other materials.	
			01CI1401	CO3 :	Identify, Describe and carry out lab tests relevant to use of civil engineering materials on site.	
			01CI1401	CO4 :	Ensure the quality of engineering materials on site.	
			01CI1401	CO5 :	Interpret the behaviour of concrete in its fresh and hardened state with respect to its strength and durability aspects.	
			01CI1401	CO6 :	Students will be able to design concrete mix according to given conditions as per IS Code	
			01CI1403	CO1 :	Understand the formation of the rock and soil as well as classify them according to Indian standards.	
			01CI1403	CO2 :	Identify the soil, rock and its minerals by simple filed testing and observations.	
			01CI1403	CO3 :	Determine the index and engineering properties of rock and soil	
			01CI1403	CO4 :	Understand the cause and effects of earthquake and volcanoes	
			01CI1403	CO5 :	Analyse the project site based on geological investigation for given project.	
			01CI1404	CO1 :	Conduct geodetic survey and differentiate between plane and geodetic survey methods.	
			01CI1404	CO2 :	Apply various theories of errors in the routine survey works.	
			01CI1404	CO3 :	Describe various methods and terminologies used in field astronomy and to locate different points on ground with respect to latitudes and longitudes.	
			01CI1404	CO4 :	Conduct surveying projects by using advanced equipment such as total station and EDM.	
			01CI1404	CO5 :	Interpret the remote sensing images.	
			01CI1404	CO6 :	Describe various terminologies and systems used in surveys using GIS	
			01CI1405	CO1 :	Import the Project and work upon the functional aspects of a building in the software.	
			01CI1405	CO2 :	To generate 3D view with the help of the software.	
			01CI1405	CO3 :	Generate a design with Components like Furniture, Electric Fixtures etc in a building.	
			01CI1405	CO4 :	Use various concepts of Building Information Modeling.	
			01CR0401	CO1 :	Express the basics of human values.	
			01CR0401	CO2 :	Articulate human values and grow as responsible human beings in the society.	
			01CR0401	CO3 :	Develop ethical conduct and deliver their professional duties.	
			01CR0401	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level.	
			5	01CE0101	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
				01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)

<b>1819</b>	<b>CIVIL ENGINEERING</b>	<b>5</b>	01CE0101	CO3 :	Express and Distinguish various loops in C language (Analyze).
			01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures (Apply)
			01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
			01CE0101	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
			01CI0304	CO1 :	Identify the properties of different types of fluids
			01CI0304	CO2 :	Measure the pressure and hydrostatic force generated by fluid.
			01CI0304	CO3 :	Categorize various types of fluid flow through channels and conduits
			01CI0304	CO4 :	Evaluate the buoyancy force and drag-lift force for the floating and immersed bodies in fluid
			01CI0501	CO1 :	Workout Average Rainfall from a catchment
			01CI0501	CO2 :	Measurement of evaporation, evapo-transpiration and infiltration rate using various methods
			01CI0501	CO3 :	Figure out runoff from a catchment using unit hydrograph
			01CI0501	CO4 :	Estimate highest flood flow in the river
			01CI0501	CO5 :	Compute the discharge from bore and yield of well
			01CI0501	CO6 :	Management of storm water and flood by different methods
			01CI0502	CO1 :	Analyze end actions of indeterminate structures by using Consistent deformation method, Moment Distribution method and Slope & deflection method.
			01CI0502	CO2 :	Examine the physical structural parameters using the strain energy concepts.
			01CI0502	CO3 :	Develop the influence lines for indeterminate beams that helps in evaluating end reactions, shear force and bending moment at particular section for moving load
			01CI0502	CO4 :	Analyze indeterminate structure using matrix method
			01CI0503	CO1 :	Explain the importance of highway planning and fundamentals of traffic engineering.
			01CI0503	CO2 :	Identify the different properties of pavement materials and recommend the maintenance strategies for highway design.
			01CI0503	CO3 :	Plan a highway project considering aspects such as highway finance and road safety.
			01CI0503	CO4 :	Examine the various parameters of highway geometry and structural design of pavements.
			01CI0504	CO1 :	Understand the various sources of water, standards, and criteria for designated uses.
			01CI0504	CO2 :	Design of primary, secondary, and tertiary water treatment units.
			01CI0504	CO3 :	Design of conveyance systems for water supply schemes.
			01CI0504	CO4 :	Need and design of separate and combined sewerage systems.
			01CI0504	CO5 :	Design aspects, role and functioning of various primary and secondary wastewater treatment units.
			01CI0505	CO1 :	Make use of Drawing tools and command
			01CI0505	CO2 :	Construct Computer aided drawing for nodes and links in transportation project
			01CI0505	CO3 :	Analyze various influencing traffic parameters and prioritize them according to their effects
			01CI0505	CO4 :	Predict the optimized signal cycle as per traffic condition
			01CI0506	CO1 :	Identify the engineering related problems in the community
			01CI0506	CO2 :	Analyze and Design different solutions to resolve the problems of community.
			01CI0506	CO3 :	Apply economical solution to those problems in the field.
			01CI0509	CO1 :	To analyse the properties of the traffic parameters.
			01CI0509	CO2 :	To apply knowledge of various traffic surveys

1819	CIVIL ENGINEERING	5	01CI0509	CO3 :	To design various traffic control devices.
			01CI0509	CO4 :	To analyse road safety as per IRC SP 88.
			01CR0501	CO1 :	Contrast and understand short pieces of business correspondence reports or proposals. (Understanding)
			01CR0501	CO2 :	Read and Categorize the extracts from business publications. Ask for the information required. (Analyzing)
			01CR0501	CO3 :	Listen to, understand and contribute to discussions in meetings. (Remembering)
			01CR0501	CO4 :	Prepare the presentation on a familiar topic. (Applying)
			01EE0103	CO1 :	Recognize importance of electrical energy and its day to day applications. (Understand)
			01EE0103	CO2 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions. (Apply)
			01EE0103	CO3 :	Analyse and solve DC Circuits, AC Single phase and magnetic circuits. (Analyse)
			01EE0103	CO4 :	Explain the need of batteries, its characteristics and charging methods. (Remember/Knowledge)
			01EE0103	CO5 :	Perceive the detail understanding of construction, operation and applications of various components like Diode, BJT and Op-Amp. (Understand)
			01EE0103	CO6 :	Recognize basic electronic devices used in various circuits. (Understand)
			01MA1101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
			01MA1101	CO2 :	Apply and solve first order differential equations to real life problems
			01MA1101	CO3 :	Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
			01MA1101	CO4 :	Apply Multiple Integral to evaluate the Surface Area and Volume of any 3D objects.
			01MA1101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
			01MA1101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
			01MA1151	CO1 :	Explain the linear dependence of vectors of different vector space.
			01MA1151	CO2 :	Apply the concept of Eigen values and vectors in various field of engineering like control theory, vibration analysis, quantum mechanics etc
			01MA1151	CO3 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.
			01MA1151	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
			01MA1151	CO5 :	Determine convergence of improper integrals and explain special functions like Beta, Gama and error functions.
			01MA1151	CO6 :	Apply Gauss elimination to solve linear system of equations
			01ME0101	CO1 :	Understand basic terminologies and fundamentals of mechanical system by correlating science concept.
			01ME0101	CO2 :	Apply the governing laws of mechanical engineering to find solution of different systems.
			01ME0101	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.
			01ME0101	CO4 :	Identify functional characteristics of various mechanisms.
			01ME0101	CO5 :	Analyze the various energy conversion cycles and systems.
			01ME0102	CO1 :	Interpret engineering drawings using fundamental technical mathematics.
			01ME0102	CO2 :	Comprehend the theory of projection.

1819	CIVIL ENGINEERING	5	01ME0102	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
			01ME0102	CO4 :	To improve their technical communication skill in the form of communicative drawings
			01ME0102	CO5 :	Construct basic and intermediate geometry.
			01ME0102	CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.
		6	01CI0601	CO1 :	Understand the functioning and network of air transport and rail transport.
			01CI0601	CO2 :	identify important components of rail transport and air transport.
			01CI0601	CO3 :	analyze geometric component of rail transport and air transport.
			01CI0601	CO4 :	evaluate geometric design of various components of air transport and rail transport.
			01CI0602	CO1 :	To understand various philosophies for structural design
			01CI0602	CO2 :	To analyse and design various types of steel connection using bolts and weld.
			01CI0602	CO3 :	To design steel structural elements in accordance to IS 800
			01CI0602	CO4 :	To ensure limit state of collapse and serviceability for structural elements
			01CI0602	CO5 :	To design RCC flexural elements in accordance to IS 456
			01CI0602	CO6 :	To design column and footing subjected to axial loads according to IS 456.
			01CI0603	CO1 :	To evaluate to predict the stresses incurred on the soil due to overlaying of foundations.
			01CI0603	CO2 :	The process of compaction and its engineering performance in the field can be clearly understood
			01CI0603	CO3 :	Predict stability of the slop and Design of slopes that are required in the construction of embankment, earth dams and canals can be successfully applied
			01CI0603	CO4 :	To able to understand the phenomena of consolidation and able to calculate the settlement of foundation
			01CI0603	CO5 :	Able to calculate strength, compresibility and permeability parameters of soil as per relevant IS code and phenomena of earth pressure.
			01CI0603	CO6 :	Able to understand various engineering properties of soil
			01CI0604	CO1 :	To work out the amount of material required for various activities of the construction of infrastructural facilities
			01CI0604	CO2 :	To acquaint the students with types of contract and contracting terminologies involved in the projects, disputes and arbitration process.
			01CI0604	CO3 :	To drafting general specifications for civil works
			01CI0604	CO4 :	To Carry out the Bidding Process and Tendering Process.
			01CI0604	CO5 :	To illustrate the rate analysis and Valuation Process
			01CI0605	CO1 :	To identify the use and applicability of different types of equipment
			01CI0605	CO2 :	To analyze different types of deep foundation and its construction techniques
			01CI0605	CO3 :	To apply various techniques used in the construction of tall structure
			01CI0605	CO4 :	To apply the safety measures required on the construction site
			01CI0605	CO5 :	To differentiate various techniques used in the demolition of the structure
01CI0605	CO6 :		To analyze different design parameters of the temporary structure		
01CI0606	CO1 :	Understand the modelling of various types of structures in STAAD PRO and ETABS.			
01CI0606	CO2 :	Apply the various types of loads to structures using STAAD PRO and ETABS.			
01CI0606	CO3 :	Analyze the concrete and steel structures using STAAD PRO and ETABS.			
01CI0606	CO4 :	Design the concrete and steel structures using STAAD PRO and ETABS.			
01CI0607	CO1 :	Identify the engineering related problems in the community			

1819	CIVIL ENGINEERING	6	01CI0607	CO2 :	Analyze and Design different solutions to resolve the problems of community.
			01CI0607	CO3 :	Apply economical solution to those problems in the field.
			01CI0608	CO1 :	List and generally explain the main sources of energy and their primary applications nationally and internationally
			01CI0608	CO2 :	Demonstrate the challenges and problems associated with the use of various energy sources, including fossil fuels, with regard to future supply and the impact on the environment
			01CI0608	CO3 :	Understand effect of using these sources on the environment and climate
			01CI0608	CO4 :	Understand the Engineering involved in project compare energy demands and quantity of the resources.
			01CI0608	CO5 :	Collect and organize information on renewable energy technologies as a basis for further analysis and evaluation.
			01CI0608	CO6 :	To quantify energy demands and make comparisons among energy uses, resources, and technologies.
		7	01CI0701	CO1 :	Calculate various types loads acting on different RCC structures as per various Indian standards.
			01CI0701	CO2 :	Design a multistorey RCC structure as per Indian standards.
			01CI0701	CO3 :	Apply the fundamentals of reinforced concrete to design structures like retaining walls, water tanks and flat slab.
			01CI0701	CO4 :	Analyze the structures considering the effects of earthquake force as per Indian standards.
			01CI0702	CO1 :	Calculate irrigation water requirement of crops
			01CI0702	CO2 :	Calculate the pressure at key points of sheet piles and floor thickness for a weir/barrage using Bligh's and khosla's theory
			01CI0702	CO3 :	Causes of failure of earthen dam and Calculate forces acting on gravity dam
			01CI0702	CO4 :	Design of the lined and unlined canal
			01CI0702	CO5 :	Understand the function of hydraulic structure of irrigation system
			01CI0703	CO1 :	To Understand the importance of quality, safety, equipments, material and account management in a Construction project.
			01CI0703	CO2 :	Create and analyze the Bar Chart, Milestone Chart and Network Diagrams by dividing project tasks into activities and events.
			01CI0703	CO3 :	Estimate the project duration, Resource allocation and Cost Optimization by CPM and PERT Methods.
			01CI0703	CO4 :	Analyze the project Organization,scheduling and Cost optimization
			01CI0704	CO1 :	Apply application of the theoretical knowledge to solve industrial/social problem.
			01CI0704	CO2 :	Understand, analyze and solve Medium/Large scale engineering field problems
			01CI0704	CO3 :	Demonstrate teamwork and leadership qualities.
			01CI0704	CO4 :	Design a solution with professional and ethical conduct as per field expectations
			01CI0705	CO1 :	Apply the concept of seismology and liquefaction for preparedness against earthquake.
			01CI0705	CO2 :	Calculate response of Single and Multi Degree of Freedom system.
			01CI0705	CO3 :	Analyze earthquake resistant building with considering lateral load according to IS: 1893-2016.
			01CI0705	CO4 :	Examine ductile detailing of structural drawings according to IS: 13920 – 2016.
			01CI0707	CO1 :	Implement the concept of urban transportation system planning process and land use planning for urban goods movement.
			01CI0707	CO2 :	Analyze the four stage transportation planning process.
			01CI0707	CO3 :	Solve the urban transport model for urban system planning.
			01CI0707	CO4 :	Sketch the comprehensive plan and transportation system management planning by focusing on different urban transit problems.

1819	CIVIL ENGINEERING	8	01CI0801	CO1 :	Select appropriate soil investigation/testing technique/method and get true sub soil parameters used for selection of type of foundation as per codal guidelines.
			01CI0801	CO2 :	Select and design appropriate/suitable foundation system (shallow) for different structures, that satisfy the allowable bearing capacity and settlement requirements based on soil properties
			01CI0801	CO3 :	Design deep foundation satisfying bearing capacity and settlement requirements
			01CI0801	CO4 :	Understand the engineering behavior of expansive soils and selection of suitable foundation type for such soils, Selection of alternate materials like geosynthetics and its application in foundation problems.
			01CI0801	CO5 :	Design and analysis of retaining walls and sheet piles under static loads
			01CI0802	CO1 :	Produce structural layout of Industrial steel structures, plate girder, foot-over bridge.
			01CI0802	CO2 :	Evaluate the loads acting on steel structures and identify the typical failure modes.
			01CI0802	CO3 :	Apply the principles, procedures and current Indian codal provisions to the analysis and design of Industrial structures, plate girder & foot-over bridges.
			01CI0802	CO4 :	Apply the principles of plastic design in steel beams & portal frames.
			01CI0803	CO1 :	Apply the theoretical knowledge to solve industrial/social problem.
			01CI0803	CO2 :	Understand, analyze and solve Medium/Large scale engineering field problems
			01CI0803	CO3 :	Demonstrate teamwork and leadership qualities.
			01CI0803	CO4 :	Design a solution with sustainability and professional ethical conduct as per field expectations
			01CI0804	CO1 :	Analyze the skeletal structure using stiffness member approach.
			01CI0804	CO2 :	Apply the concept of stiffness method with considering secondary effects in structure.
			01CI0804	CO3 :	Analyze domes for different loading condition.
			01CI0804	CO4 :	Evaluate the internal forces for beams curved in plan subjected to point load and uniformly distributed load.
			01CI0805	CO1 :	To identify type of distress in deteriorated concrete structure.
			01CI0805	CO2 :	To estimate the extent of damage level in concrete structures using Non Destructive Tests
			01CI0805	CO3 :	To implement various rehabilitation and retrofitting techniques using various innovative materials in structures.
			01CI0805	CO4 :	To understand usefulness of various structural health monitoring methods and its applications in maintenance of structures.
			01CI0807	CO1 :	Know the possibilities of energy recovery from waste.
			01CI0807	CO2 :	Classify the sources, types, composition and quantities of solid waste
			01CI0807	CO3 :	Take measure to collection, transfer, transport, separate and process of solid and Hazardous waste
			01CI0807	CO4 :	Appraise aspects and issues related to recycling and composting of solid waste
			01CI0807	CO5 :	Understand the legislations for waste management.
			01CI0809	CO1 :	Apply concepts & methods for prestressing systems for different materials.
			01CI0809	CO2 :	Determine the losses in beams due to prestress, short and long term deflection, flexural and shear strength of beam.
			01CI0809	CO3 :	Design the pre-tensioned and post-tensioned concrete beams & slab, anchorage zones.
			01CI0809	CO4 :	Analyze and design of simply supported RC slab & girder type superstructure as per IRC specifications
			01CI0810	CO1 :	Develop infrastructure master plan and Schedule infrastructure project activities.
			01CI0810	CO2 :	Prepare project development plan for infrastructure organizations and systems.





<b>1819</b>	<b>CIVIL ENGINEERING</b>	<b>8</b>	01CI0810	CO3 :	Prepare tender documents for infrastructure project by understanding different engineering contracts.
			01CI0810	CO4 :	Apply the management techniques like CPM and PERT to infrastructure projects.
			01CI0810	CO5 :	Analyze the management process for infrastructure projects.

**Course Outcome**  
**Batch**  
**(2019-23)**  
**B.Tech. in Civil Engineering**

Batch	Stream	Sem	Subject Code	Sr No	Course Out Comes
1920	CIVIL ENGINEERING	1	01CI0101	CO1 :	Recognize importance of Civil engineering and its day to day applications.
			01CI0101	CO2 :	Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
			01CI0101	CO3 :	Describe qualitative comparison between different materials and its selection.
			01CI0101	CO4 :	Analyse the water resources, its harvesting and its consumptive use.
			01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
			01CI0101	CO6 :	Acquaint with the various modes of transportation.
			01CR0103	CO1 :	Understand importance of role of Values in developing self
			01CR0103	CO2 :	Inculcate right values, ethics, attitudes, manners and behaviours for life
			01CR0103	CO3 :	Respond and relate with expectations, competitions and power of networking
			01CR0103	CO4 :	Apply the values in order to live a positive, healthy and productive life.
			01CR0103	CO5 :	Understand the significance of having appropriate attitude and balance towards work life as well as personal life.
			01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
			01EN0101	CO2 :	Know the importance of natural resources for the sustainable development of life.
			01EN0101	CO3 :	Understand the effect of growing population on the Environment.
			01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
			01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
			01MA1101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
			01MA1101	CO2 :	Apply and solve first order differential equations to real life problems
			01MA1101	CO3 :	Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
			01MA1101	CO4 :	Apply Multiple Integral to evaluate the Surface Area and Volume of any 3D objects.
			01MA1101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
			01MA1101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
			01ME0101	CO1 :	Understand basic terminologies and fundamentals of mechanical system by correlating science concept.
			01ME0101	CO2 :	Apply the governing laws of mechanical engineering to find solution of different systems.
			01ME0101	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.
			01ME0101	CO4 :	Identify functional characteristics of various mechanisms.
			01ME0101	CO5 :	Analyze the various energy conversion cycles and systems.
			01ME0104	CO1 :	Learn about Application of hand tools and power tools.
			01ME0104	CO2 :	Learn about various operations of machine tools.
			01ME0104	CO3 :	Selection of processes and steps for specific operation
			01ME0104	CO4 :	Knowledge and awareness about various safety related operation
			01SL0102	CO0 :	To enhance reading skills for academic purposes.
			01SL0102	CO1 :	To enhance reading skills for academic purposes
			01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes

1920	CIVIL ENGINEERING	1	01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
			01SL0102	CO4 :	To express their ideas in formal, academic written form
			01SL0103	CO1 :	Develop speaking competence for academic purpose
			01SL0103	CO2 :	Speak on a given topic in the context of technology
			01SL0103	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements
			01SL0103	CO4 :	Enhance the ability to make a presentation on a given topic
		2	01CE0101	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
			01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
			01CE0101	CO3 :	Express and Distinguish various loops in C language (Analyze).
			01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures (Apply)
			01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
			01CE0101	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
			01CH0101	CO1 :	Explain the basic concepts of organic chemistry and recent trends in Green Chemistry.
			01CH0101	CO2 :	Demonstrate the knowledge of fundamentals of water technology and identify the various water treatment methods.
			01CH0101	CO3 :	Understand chemistry behind corrosion and identify the various types of corrosion and its effect.
			01CH0101	CO4 :	Identify as well as classify the properties of various types of cement, Refractory, Abrasives and Insulators, Polymers etc.
			01EE0103	CO1 :	Recognize importance of electrical energy and its day to day applications. (Understand)
			01EE0103	CO2 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions. (Apply)
			01EE0103	CO3 :	Analyse and solve DC Circuits, AC Single phase and magnetic circuits. (Analyse)
			01EE0103	CO4 :	Explain the need of batteries, its characteristics and charging methods. (Remember/Knowledge)
			01EE0103	CO5 :	Perceive the detail understanding of construction, operation and applications of various components like Diode, BJT and Op-Amp. (Understand)
			01EE0103	CO6 :	Recognize basic electronic devices used in various circuits. (Understand)
			01GS0101	CO1 :	To Interpret the mechanics of various types of sound waves -what they look like, how they are produced, interact with other sound waves and materials.
			01GS0101	CO2 :	To Describe the basic physical principles and applications of ultrasonic sound.
			01GS0101	CO3 :	To Discuss construction, principle of optical fiber communication. Analyze the structure and properties of lasers to their performance and intended applications .
			01GS0101	CO4 :	To Utilize the concept of superconductivity, magnetic and advanced engineering materials and their behaviors under various system conditions.
			01GS0101	CO5 :	To Explain the need of NDT and its methodologies. Illustrate the properties and mechanisms of nano physics.
			01GS0101	CO6 :	To demonstrate in the laboratory the ability to collect, analyze data and to prepare coherent reports of his or her findings
			01MA1151	CO1 :	Explain the linear dependence of vectors of different vector space.
			01MA1151	CO2 :	Apply the concept of Eigen values and vectors in various field of engineering like control theory, vibration analysis, quantum mechanics etc
			01MA1151	CO3 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.

1920	CIVIL ENGINEERING	2	01MA1151 CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
			01MA1151 CO5 :	Determine convergence of improper integrals and explain special functions like Beta, Gama and error functions.
			01MA1151 CO6 :	Apply Gauss elimination to solve linear system of equations
			01ME0102 CO1 :	Interpret engineering drawings using fundamental technical mathematics.
			01ME0102 CO2 :	Comprehend the theory of projection.
			01ME0102 CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
			01ME0102 CO4 :	To improve their technical communication skill in the form of communicative drawings
			01ME0102 CO5 :	Construct basic and intermediate geometry.
			01ME0102 CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.
			01ME0104 CO1 :	Learn about Application of hand tools and power tools.
			01ME0104 CO2 :	Learn about various operations of machine tools.
			01ME0104 CO3 :	Selection of processes and steps for specific operation
			01ME0104 CO4 :	Knowledge and awareness about various safety related operation
		3	01CI0301 CO1 :	To apply fundamental principles of mechanics and equilibrium to get responses of rigid and deformable bodies
			01CI0301 CO2 :	To identify centroid, Center of Gravity, Center of Mass and moment of inertia of a simple and complex geometrical Shapes.
			01CI0301 CO3 :	To determine different types of stresses and strains developed in the Member subjected to axial, bending, shear, torsion & thermal loads.
			01CI0301 CO4 :	To analyze the determinate beam and draw its shear force and bending moment diagram.
			01CI0302 CO1 :	Interpret the technical terminologies related to planning and various conventional signs and symbols used in drawing the plans.(Understanding)
			01CI0302 CO2 :	Draw plan for building (Mass Composition, Residential, Industrial and Public) by making use of various aspects of principles of planning, architecture and as per standard bye laws. (Applying)
			01CI0302 CO3 :	Draw perspective, isometric, orthographic, cross-sectional and elevational drawing of the building by imagination. (Analyzing)
			01CI0302 CO4 :	Draw, edit and print the plan of the building by using computer application like AutoCAD. (Analyzing)
			01CI0303 CO1 :	Understand basic principles of various methods of surveying.
			01CI0303 CO2 :	Obtain the included angles, latitude and departure of the traverse lines on the field.
			01CI0303 CO3 :	Set the different types of curves on the field during survey work.
			01CI0303 CO4 :	Analyze, calculate and measure the area and volumes of the different capacities and topographical situations
			01CI0304 CO1 :	Identify the properties of different types of fluids
			01CI0304 CO2 :	Measure the pressure and hydrostatic force generated by fluid.
			01CI0304 CO3 :	Categorize various types of fluid flow through channels and conduits
			01CI0304 CO4 :	Evaluate the buoyancy force and drag-lift force for the floating and immersed bodies in fluid
			01CI0305 CO1 :	Make use of Drawing tools and command
			01CI0305 CO2 :	Construct Computer aided drawing in civil engineering project
			01CI0305 CO3 :	Examine the role of different parameter used in Software application for Civil Engineering and its benefits
			01CI0305 CO4 :	Prepare working drawings, foundation plans and other executable drawings with proper details for residential buildings, commercial and institutional buildings

1920	CIVIL ENGINEERING	3	01CI0306	CO1 :	Identify the engineering related problems in the community
			01CI0306	CO2 :	Compare the different solutions to resolve the problems of community by case study and survey.
			01CI0306	CO3 :	Analyze and solve the issue of community by providing economical solution to the problem
			01MA0301	CO1 :	Expand Various functions in terms of sine and cosine functions
			01MA0301	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations
			01MA0301	CO3 :	Apply Laplace transform & series solution to solve differential equations.
			01MA0301	CO4 :	Apply the knowledge of differential equations and its solutions to evaluate engineering problems
		4	01CI0402	CO1 :	Classify structural systems and apply principles of statics to analyze statically determinate structures (Applying)
			01CI0402	CO2 :	To calculate stresses on structures subjected to combined axial and bending forces (Analysis)
			01CI0402	CO3 :	To compute buckling load for long columns with different end conditions using Rankine's and Euler's theory (Analysis)
			01CI0402	CO4 :	To determine stresses in thin cylinders and spherical vessels (Analysis)
			01CI0402	CO5 :	To compute strain energy stored in a body due to application of axial, shear, bending and torsional forces (Analysis)
			01CI0402	CO6 :	To develop the influence line diagram for determinate structures (Applying)
			01CI0407	CO1 :	Understand the importance of civil engineering knowledge to solve real life issues in community.
			01CI0407	CO2 :	Analyze and solve the issue of community solvable by providing economical solution to the problem
			01CI0407	CO3 :	Build strong personal skills and learn how to take key decisions about projects.
			01CI1401	CO1 :	Students will be able to understand features of special concrete and concreting methods
			01CI1401	CO2 :	Analyze the engineering properties of Civil Engineering materials like aggregate, cement, concrete, steel, wood, plastic, paints and other materials.
			01CI1401	CO3 :	Identify, Describe and carry out lab tests relevant to use of civil engineering materials on site.
			01CI1401	CO4 :	Ensure the quality of engineering materials on site.
			01CI1401	CO5 :	Interpret the behaviour of concrete in its fresh and hardened state with respect to its strength and durability aspects.
			01CI1401	CO6 :	Students will be able to design concrete mix according to given conditions as per IS Code
			01CI1403	CO1 :	Understand the formation of the rock and soil as well as classify them according to Indian standards.
			01CI1403	CO2 :	Identify the soil, rock and its minerals by simple field testing and observations.
			01CI1403	CO3 :	Determine the index and engineering properties of rock and soil
			01CI1403	CO4 :	Understand the cause and effects of earthquake and volcanoes
			01CI1403	CO5 :	Analyse the project site based on geological investigation for given project.
			01CI1404	CO1 :	Conduct geodetic survey and differentiate between plane and geodetic survey methods.
			01CI1404	CO2 :	Apply various theories of errors in the routine survey works.
			01CI1404	CO3 :	Describe various methods and terminologies used in field astronomy and to locate different points on ground with respect to latitudes and longitudes.
01CI1404	CO4 :	Conduct surveying projects by using advanced equipment such as total station and EDM.			
01CI1404	CO5 :	Interpret the remote sensing images.			
01CI1404	CO6 :	Describe various terminologies and systems used in surveys using GIS			

<b>1920</b>	<b>CIVIL ENGINEERING</b>	<b>4</b>	01CI1405	CO1 :	Import the Project and work upon the functional aspects of a building in the software.
			01CI1405	CO2 :	To generate 3D view with the help of the software.
			01CI1405	CO3 :	Generate a design with Components like Furniture, Electric Fixtures etc in a building.
			01CI1405	CO4 :	Use various concepts of Building Information Modeling.
			01CR0401	CO1 :	Express the basics of human values.
			01CR0401	CO2 :	Articulate human values and grow as responsible human beings in the society.
			01CR0401	CO3 :	Develop ethical conduct and deliver their professional duties.
			01CR0401	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level.
		<b>5</b>	01CI0501	CO1 :	Workout Average Rainfall from a catchment
			01CI0501	CO2 :	Measurement of evaporation, evapo-transpiration and infiltration rate using various methods
			01CI0501	CO3 :	Figure out runoff from a catchment using unit hydrograph
			01CI0501	CO4 :	Estimate highest flood flow in the river
			01CI0501	CO5 :	Compute the discharge from bore and yield of well
			01CI0501	CO6 :	Management of storm water and flood by different methods
			01CI0502	CO1 :	Analyze end actions of indeterminate structures by using Consistent deformation method, Moment Distribution method and Slope & deflection method.
			01CI0502	CO2 :	Examine the physical structural parameters using the strain energy concepts.
			01CI0502	CO3 :	Develop the influence lines for indeterminate beams that helps in evaluating end reactions, shear force and bending moment at particular section for moving load
			01CI0502	CO4 :	Analyze indeterminate structure using matrix method
			01CI0503	CO1 :	Explain the importance of highway planning and fundamentals of traffic engineering.
			01CI0503	CO2 :	Identify the different properties of pavement materials and recommend the maintenance strategies for highway design.
			01CI0503	CO3 :	Plan a highway project considering aspects such as highway finance and road safety.
			01CI0503	CO4 :	Examine the various parameters of highway geometry and structural design of pavements.
			01CI0504	CO1 :	Understand the various sources of water, standards, and criteria for designated uses.
			01CI0504	CO2 :	Design of primary, secondary, and tertiary water treatment units.
			01CI0504	CO3 :	Design of conveyance systems for water supply schemes.
			01CI0504	CO4 :	Need and design of separate and combined sewerage systems.
			01CI0504	CO5 :	Design aspects, role and functioning of various primary and secondary wastewater treatment units.
			01CI0505	CO1 :	Make use of Drawing tools and command
			01CI0505	CO2 :	Construct Computer aided drawing for nodes and links in transportation project
			01CI0505	CO3 :	Analyze various influencing traffic parameters and prioritize them according to their effects
			01CI0505	CO4 :	Predict the optimized signal cycle as per traffic condition
			01CI0506	CO1 :	Identify the engineering related problems in the community
			01CI0506	CO2 :	Analyze and Design different solutions to resolve the problems of community.
01CI0506	CO3 :	Apply economical solution to those problems in the field.			
01CI0509	CO1 :	To analyse the properties of the traffic parameters.			

1920	CIVIL ENGINEERING	5	01CI0509	CO2 :	To apply knowledge of various traffic surveys
			01CI0509	CO3 :	To design various traffic control devices.
			01CI0509	CO4 :	To analyse road safety as per IRC SP 88.
			01CR0501	CO1 :	Contrast and understand short pieces of business correspondence reports or proposals. (Understanding)
			01CR0501	CO2 :	Read and Categorize the extracts from business publications. Ask for the information required. (Analyzing)
			01CR0501	CO3 :	Listen to, understand and contribute to discussions in meetings. (Remembering)
			01CR0501	CO4 :	Prepare the presentation on a familiar topic. (Applying)
		6	01CI0601	CO1 :	Understand the functioning and network of air transport and rail transport.
			01CI0601	CO2 :	identify important components of rail transport and air transport.
			01CI0601	CO3 :	analyze geometric component of rail transport and air transport.
			01CI0601	CO4 :	evaluate geometric design of various components of air transport and rail transport.
			01CI0602	CO1 :	To understand various philosophies for structural design
			01CI0602	CO2 :	To analyse and design various types of steel connection using bolts and weld.
			01CI0602	CO3 :	To design steel structural elements in accordance to IS 800
			01CI0602	CO4 :	To ensure limit state of collapse and serviceability for structural elements
			01CI0602	CO5 :	To design RCC flexural elements in accordance to IS 456
			01CI0602	CO6 :	To design column and footing subjected to axial loads according to IS 456.
			01CI0603	CO1 :	To evaluate to predict the stresses incurred on the soil due to overlaying of foundations.
			01CI0603	CO2 :	The process of compaction and its engineering performance in the field can be clearly understood
			01CI0603	CO3 :	Predict stability of the slop and Design of slopes that are required in the construction of embankment, earth dams and canals can be successfully applied
			01CI0603	CO4 :	To able to understand the phenomena of consolidation and able to calculate the settlement of foundation
			01CI0603	CO5 :	Able to calculate strength, compresibility and permeability parameters of soil as per relevant IS code and phenomena of earth pressure.
			01CI0603	CO6 :	Able to understand various engineering properties of soil
			01CI0604	CO1 :	To work out the amount of material required for various activities of the construction of infrastructural facilities
			01CI0604	CO2 :	To acquaint the students with types of contract and contracting terminologies involved in the projects, disputes and arbitration process.
			01CI0604	CO3 :	To drafting general specifications for civil works
			01CI0604	CO4 :	To Carry out the Bidding Process and Tendering Process.
			01CI0604	CO5 :	To illustrate the rate analysis and Valuation Process
			01CI0605	CO1 :	To identify the use and applicability of different types of equipment
			01CI0605	CO2 :	To analyze different types of deep foundation and its construction techniques
			01CI0605	CO3 :	To apply various techniques used in the construction of tall structure
			01CI0605	CO4 :	To apply the safety measures required on the construction site
			01CI0605	CO5 :	To differentiate various techniques used in the demolition of the structure
01CI0605	CO6 :	To analyze different design parameters of the temporary structure			
01CI0606	CO1 :	Understand the modelling of various types of structures in STAAD PRO and ETABS.			



<b>1920</b>	<b>CIVIL ENGINEERING</b>	<b>6</b>	01CI0606	CO2 :	Apply the various types of loads to structures using STAAD PRO and ETABS.
			01CI0606	CO3 :	Analyze the concrete and steel structures using STAAD PRO and ETABS.
			01CI0606	CO4 :	Design the concrete and steel structures using STAAD PRO and ETABS.
			01CI0607	CO1 :	Identify the engineering related problems in the community
			01CI0607	CO2 :	Analyze and Design different solutions to resolve the problems of community.
			01CI0607	CO3 :	Apply economical solution to those problems in the field.
			01CI0608	CO1 :	List and generally explain the main sources of energy and their primary applications nationally and internationally
			01CI0608	CO2 :	Demonstrate the challenges and problems associated with the use of various energy sources, including fossil fuels, with regard to future supply and the impact on the environment
			01CI0608	CO3 :	Understand effect of using these sources on the environment and climate
			01CI0608	CO4 :	Understand the Engineering involved in project compare energy demands and quantity of the resources.
			01CI0608	CO5 :	Collect and organize information on renewable energy technologies as a basis for further analysis and evaluation.
			01CI0608	CO6 :	To quantify energy demands and make comparisons among energy uses, resources, and technologies.
		<b>7</b>	01CI0701	CO1 :	Calculate various types loads acting on different RCC structures as per various Indian standards.
			01CI0701	CO2 :	Design a multistorey RCC structure as per Indian standards.
			01CI0701	CO3 :	Apply the fundamentals of reinforced concrete to design structures like retaining walls, water tanks and flat slab.
			01CI0701	CO4 :	Analyze the structures considering the effects of earthquake force as per Indian standards.
			01CI0702	CO1 :	Calculate irrigation water requirement of crops
			01CI0702	CO2 :	Calculate the pressure at key points of sheet piles and floor thickness for a weir/barrage using Bligh's and khosla's theory
			01CI0702	CO3 :	Causes of failure of earthen dam and Calculate forces acting on gravity dam
			01CI0702	CO4 :	Design of the lined and unlined canal
			01CI0702	CO5 :	Understand the function of hydraulic structure of irrigation system
			01CI0703	CO1 :	To Understand the importance of quality, safety, equipments, material and account management in a Construction project.
			01CI0703	CO2 :	Create and analyze the Bar Chart, Milestone Chart and Network Diagrams by dividing project tasks into activities and events.
			01CI0703	CO3 :	Estimate the project duration, Resource allocation and Cost Optimization by CPM and PERT Methods.
			01CI0703	CO4 :	Analyze the project Organization,scheduling and Cost optimization
			01CI0704	CO1 :	Apply application of the theoretical knowledge to solve industrial/social problem.
			01CI0704	CO2 :	Understand, analyze and solve Medium/Large scale engineering field problems
			01CI0704	CO3 :	Demonstrate teamwork and leadership qualities.
			01CI0704	CO4 :	Design a solution with professional and ethical conduct as per field expectations
			01CI0705	CO1 :	Apply the concept of seismology and liquefaction for preparedness against earthquake.
			01CI0705	CO2 :	Calculate response of Single and Multi Degree of Freedom system.
			01CI0705	CO3 :	Analyze earthquake resistant building with considering lateral load according to IS: 1893-2016.
			01CI0705	CO4 :	Examine ductile detailing of structural drawings according to IS: 13920 – 2016.
01CI0707	CO1 :		Implement the concept of urban transportation system planning process and land use planning for urban goods movement.		

1920	CIVIL ENGINEERING	7	01CI0707	CO2 :	Analyze the four stage transportation planning process.
			01CI0707	CO3 :	Solve the urban transport model for urban system planning.
			01CI0707	CO4 :	Sketch the comprehensive plan and transportation system management planning by focusing on different urban transit problems.
		8	01CI0801	CO1 :	Select appropriate soil investigation/testing technique/method and get true sub soil parameters used for selection of type of foundation as per codal guidelines.
			01CI0801	CO2 :	Select and design appropriate/suitable foundation system (shallow) for different structures, that satisfy the allowable bearing capacity and settlement requirements based on soil properties
			01CI0801	CO3 :	Design deep foundation satisfying bearing capacity and settlement requirements
			01CI0801	CO4 :	Understand the engineering behavior of expansive soils and selection of suitable foundation type for such soils, Selection of alternate materials like geosynthetics and its application in foundation problems.
			01CI0801	CO5 :	Design and analysis of retaining walls and sheet piles under static loads
			01CI0802	CO1 :	Produce structural layout of Industrial steel structures, plate girder, foot-over bridge.
			01CI0802	CO2 :	Evaluate the loads acting on steel structures and identify the typical failure modes.
			01CI0802	CO3 :	Apply the principles, procedures and current Indian codal provisions to the analysis and design of Industrial structures, plate girder & foot-over bridges.
			01CI0802	CO4 :	Apply the principles of plastic design in steel beams & portal frames.
			01CI0803	CO1 :	Apply the theoretical knowledge to solve industrial/social problem.
			01CI0803	CO2 :	Understand, analyze and solve Medium/Large scale engineering field problems
			01CI0803	CO3 :	Demonstrate teamwork and leadership qualities.
			01CI0803	CO4 :	Design a solution with sustainability and professional ethical conduct as per field expectations
			01CI0807	CO1 :	Know the possibilities of energy recovery from waste.
			01CI0807	CO2 :	Classify the sources, types, composition and quantities of solid waste
			01CI0807	CO3 :	Take measure to collection, transfer, transport, separate and process of solid and Hazardous waste
			01CI0807	CO4 :	Appraise aspects and issues related to recycling and composting of solid waste
			01CI0807	CO5 :	Understand the legislations for waste management.
			01CI0808	CO1 :	Identify major challenges facing the planet earth and human society
			01CI0808	CO2 :	Describe primary components of a sustainable engineering system
			01CI0808	CO3 :	Utilize engineering principles for design and construction of green structures
		01CI0808	CO4 :	Perform detail performance evaluation of a building based on LEED standards	
		01CI0808	CO5 :	Evaluate feasibility of alternative products and solutions based on life-cycle analysis (LCA) methods	
		01CI0809	CO1 :	Apply concepts & methods for prestressing systems for different materials.	
		01CI0809	CO2 :	Determine the losses in beams due to prestress, short and long term deflection, flexural and shear strength of beam.	
		01CI0809	CO3 :	Design the pre-tensioned and post-tensioned concrete beams & slab, anchorage zones.	
		01CI0809	CO4 :	Analyze and design of simply supported RC slab & girder type superstructure as per IRC specifications	
01CI0810	CO1 :	Develop infrastructure master plan and Schedule infrastructure project activities.			
01CI0810	CO2 :	Prepare project development plan for infrastructure organizations and systems.			
01CI0810	CO3 :	Prepare tender documents for infrastructure project by understanding different engineering contracts.			



<b>1920</b>	<b>CIVIL ENGINEERING</b>	<b>8</b>	01CI0810	CO4 :	Apply the management techniques like CPM and PERT to infrastructure projects.
			01CI0810	CO5 :	Analyze the management process for infrastructure projects.

**Course Outcome**  
**Batch**  
**(2020-24)**  
**B.Tech. in Civil Engineering**

Batch	Stream	Sem	Subject Code	Sr No	Course Out Comes
2021	CIVIL ENGINEERING	1	01CI0101	CO1 :	Recognize importance of Civil engineering and its day to day applications.
			01CI0101	CO2 :	Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
			01CI0101	CO3 :	Describe qualitative comparison between different materials and its selection.
			01CI0101	CO4 :	Analyse the water resources, its harvesting and its consumptive use.
			01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
			01CI0101	CO6 :	Acquaint with the various modes of transportation.
			01CR0103	CO1 :	Understand importance of role of Values in developing self
			01CR0103	CO2 :	Inculcate right values, ethics, attitudes, manners and behaviours for life
			01CR0103	CO3 :	Respond and relate with expectations, competitions and power of networking
			01CR0103	CO4 :	Apply the values in order to live a positive, healthy and productive life.
			01CR0103	CO5 :	Understand the significance of having appropriate attitude and balance towards work life as well as personal life.
			01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
			01EN0101	CO2 :	Know the importance of natural resources for the sustainable development of life.
			01EN0101	CO3 :	Understand the effect of growing population on the Environment.
			01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
			01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
			01MA1101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
			01MA1101	CO2 :	Apply and solve first order differential equations to real life problems
			01MA1101	CO3 :	Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
			01MA1101	CO4 :	Apply Multiple Integral to evaluate the Surface Area and Volume of any 3D objects.
			01MA1101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
			01MA1101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
			01ME0101	CO1 :	Understand basic terminologies and fundamentals of mechanical system by correlating science concept.
			01ME0101	CO2 :	Apply the governing laws of mechanical engineering to find solution of different systems.
			01ME0101	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.
			01ME0101	CO4 :	Identify functional characteristics of various mechanisms.
			01ME0101	CO5 :	Analyze the various energy conversion cycles and systems.
			01ME0104	CO1 :	Learn about Application of hand tools and power tools.
			01ME0104	CO2 :	Learn about various operations of machine tools.
			01ME0104	CO3 :	Selection of processes and steps for specific operation
			01ME0104	CO4 :	Knowledge and awareness about various safety related operation
			01SL0102	CO0 :	To enhance reading skills for academic purposes.
			01SL0102	CO1 :	To enhance reading skills for academic purposes
			01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes

2021	CIVIL ENGINEERING	1			
			01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
			01SL0102	CO4 :	To express their ideas in formal, academic written form
			01SL0103	CO1 :	Develop speaking competence for academic purpose
			01SL0103	CO2 :	Speak on a given topic in the context of technology
			01SL0103	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements
			01SL0103	CO4 :	Enhance the ability to make a presentation on a given topic
		2	01CE0101	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
			01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
			01CE0101	CO3 :	Express and Distinguish various loops in C language (Analyze).
			01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures (Apply)
			01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
			01CE0101	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
			01EE0103	CO1 :	Recognize importance of electrical energy and its day to day applications. (Understand)
			01EE0103	CO2 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions. (Apply)
			01EE0103	CO3 :	Analyse and solve DC Circuits, AC Single phase and magnetic circuits. (Analyze)
			01EE0103	CO4 :	Explain the need of batteries, its characteristics and charging methods. (Remember/Knowledge)
			01EE0103	CO5 :	Perceive the detail understanding of construction, operation and applications of various components like Diode, BJT and Op-Amp. (Understand)
			01EE0103	CO6 :	Recognize basic electronic devices used in various circuits. (Understand)
			01GS0101	CO1 :	To Interpret the mechanics of various types of sound waves -what they look like, how they are produced, interact with other sound waves and materials.
			01GS0101	CO2 :	To Describe the basic physical principles and applications of ultrasonic sound.
			01GS0101	CO3 :	To Discuss construction, principle of optical fiber communication. Analyze the structure and properties of lasers to their performance and intended applications .
			01GS0101	CO4 :	To Utilize the concept of superconductivity, magnetic and advanced engineering materials and their behaviors under various system conditions.
			01GS0101	CO5 :	To Explain the need of NDT and its methodologies. Illustrate the properties and mechanisms of nano physics.
			01GS0101	CO6 :	To demonstrate in the laboratory the ability to collect, analyze data and to prepare coherent reports of his or her findings
			01MA1151	CO1 :	Explain the linear dependence of vectors of different vector space.
			01MA1151	CO2 :	Apply the concept of Eigen values and vectors in various field of engineering like control theory, vibration analysis, quantum mechanics etc
			01MA1151	CO3 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.
			01MA1151	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
			01MA1151	CO5 :	Determine convergence of improper integrals and explain special functions like Beta, Gama and error functions.
			01MA1151	CO6 :	Apply Gauss elimination to solve linear system of equations
			01ME0102	CO1 :	Interpret engineering drawings using fundamental technical mathematics.
			01ME0102	CO2 :	Comprehend the theory of projection.

2021	CIVIL ENGINEERING	2	01ME0102	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
		01ME0102	CO4 :	To improve their technical communication skill in the form of communicative drawings	
		01ME0102	CO5 :	Construct basic and intermediate geometry.	
		01ME0102	CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.	
		3	01CI0301	CO1 :	To apply fundamental principles of mechanics and equilibrium to get responses of rigid and deformable bodies
		01CI0301	CO2 :	To identify centroid, Center of Gravity, Center of Mass and moment of inertia of a simple and complex geometrical Shapes.	
		01CI0301	CO3 :	To determine different types of stresses and strains developed in the Member subjected to axial, bending, shear, torsion & thermal loads.	
		01CI0301	CO4 :	To analyze the determinate beam and draw its shear force and bending moment diagram.	
		01CI0302	CO1 :	Interpret the technical terminologies related to planning and various conventional signs and symbols used in drawing the plans.(Understanding)	
		01CI0302	CO2 :	Draw plan for building (Mass Composition, Residential, Industrial and Public) by making use of various aspects of principles of planning, architecture and as per standard bye laws. (Applying)	
		01CI0302	CO3 :	Draw perspective, isometric, orthographic, cross-sectional and elevational drawing of the building by imagination. (Analyzing)	
		01CI0302	CO4 :	Draw, edit and print the plan of the building by using computer application like AutoCAD. (Analyzing)	
		01CI0303	CO1 :	Understand basic principles of various methods of surveying.	
		01CI0303	CO2 :	Obtain the included angles, latitude and departure of the traverse lines on the field.	
		01CI0303	CO3 :	Set the different types of curves on the field during survey work.	
		01CI0303	CO4 :	Analyze, calculate and measure the area and volumes of the different capacities and topographical situations	
		01CI0304	CO1 :	Identify the properties of different types of fluids	
		01CI0304	CO2 :	Measure the pressure and hydrostatic force generated by fluid.	
		01CI0304	CO3 :	Categorize various types of fluid flow through channels and conduits	
		01CI0304	CO4 :	Evaluate the buoyancy force and drag-lift force for the floating and immersed bodies in fluid	
		01CI0305	CO1 :	Make use of Drawing tools and command	
		01CI0305	CO2 :	Construct Computer aided drawing in civil engineering project	
		01CI0305	CO3 :	Examine the role of different parameter used in Software application for Civil Engineering and its benefits	
		01CI0305	CO4 :	Prepare working drawings, foundation plans and other executable drawings with proper details for residential buildings, commercial and institutional buildings	
	01CI0306	CO1 :	Identify the engineering related problems in the community		
	01CI0306	CO2 :	Compare the different solutions to resolve the problems of community by case study and survey.		
	01CI0306	CO3 :	Analyze and solve the issue of community by providing economical solution to the problem		
	01MA0301	CO1 :	Expand Various functions in terms of sine and cosine functions		
	01MA0301	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations		
	01MA0301	CO3 :	Apply Laplace transform & series solution to solve differential equations.		
	01MA0301	CO4 :	Apply the knowledge of differential equations and its solutions to evaluate engineering problems		
	4	01CI0402	CO1 :	Classify structural systems and apply principles of statics to analyze statically determinate structures (Applying)	

2021	CIVIL ENGINEERING	4	01CI0402	CO2 :	To calculate stresses on structures subjected to combined axial and bending forces (Analysis)
			01CI0402	CO3 :	To compute buckling load for long columns with different end conditions using Rankine's and Euler's theory (Analysis)
			01CI0402	CO4 :	To determine stresses in thin cylinders and spherical vessels (Analysis)
			01CI0402	CO5 :	To compute strain energy stored in a body due to application of axial, shear, bending and torsional forces (Analysis)
			01CI0402	CO6 :	To develop the influence line diagram for determinate structures (Applying)
			01CI0408	CO1 :	Importance of creativity, problem solving and innovation while addressing science, engineering and social issues.
			01CI0408	CO2 :	Demonstrate the ability to contextualize knowledge related to professional engineering practices.
			01CI0408	CO3 :	Demonstrate the functioning effectively as an individual and team member.
			01CI0408	CO4 :	Ability to engage in life-long learning in the context of technological change
			01CI1401	CO1 :	Students will be able to understand features of special concrete and concreting methods
			01CI1401	CO2 :	Analyze the engineering properties of Civil Engineering materials like aggregate, cement, concrete, steel, wood, plastic, paints and other materials.
			01CI1401	CO3 :	Identify, Describe and carry out lab tests relevant to use of civil engineering materials on site.
			01CI1401	CO4 :	Ensure the quality of engineering materials on site.
			01CI1401	CO5 :	Interpret the behaviour of concrete in its fresh and hardened state with respect to its strength and durability aspects.
			01CI1401	CO6 :	Students will be able to design concrete mix according to given conditions as per IS Code
			01CI1403	CO1 :	Understand the formation of the rock and soil as well as classify them according to Indian standards.
			01CI1403	CO2 :	Identify the soil, rock and its minerals by simple field testing and observations.
			01CI1403	CO3 :	Determine the index and engineering properties of rock and soil
			01CI1403	CO4 :	Understand the cause and effects of earthquake and volcanoes
			01CI1403	CO5 :	Analyse the project site based on geological investigation for given project.
			01CI1404	CO1 :	Conduct geodetic survey and differentiate between plane and geodetic survey methods.
			01CI1404	CO2 :	Apply various theories of errors in the routine survey works.
			01CI1404	CO3 :	Describe various methods and terminologies used in field astronomy and to locate different points on ground with respect to latitudes and longitudes.
			01CI1404	CO4 :	Conduct surveying projects by using advanced equipment such as total station and EDM.
			01CI1404	CO5 :	Interpret the remote sensing images.
			01CI1404	CO6 :	Describe various terminologies and systems used in surveys using GIS
			01CI1405	CO1 :	Import the Project and work upon the functional aspects of a building in the software.
			01CI1405	CO2 :	To generate 3D view with the help of the software.
			01CI1405	CO3 :	Generate a design with Components like Furniture, Electric Fixtures etc in a building.
			01CI1405	CO4 :	Use various concepts of Building Information Modeling.
			01CR0401	CO1 :	Express the basics of human values.
			01CR0401	CO2 :	Articulate human values and grow as responsible human beings in the society.
			01CR0401	CO3 :	Develop ethical conduct and deliver their professional duties.
			01CR0401	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level.



2021	CIVIL ENGINEERING	5			
			01CI0501	CO1 :	Workout Average Rainfall from a catchment
			01CI0501	CO2 :	Measurement of evaporation, evapo-transpiration and infiltration rate using various methods
			01CI0501	CO3 :	Figure out runoff from a catchment using unit hydrograph
			01CI0501	CO4 :	Estimate highest flood flow in the river
			01CI0501	CO5 :	Compute the discharge from bore and yield of well
			01CI0501	CO6 :	Management of storm water and flood by different methods
			01CI0502	CO1 :	Analyze end actions of indeterminate structures by using Consistent deformation method, Moment Distribution method and Slope & deflection method.
			01CI0502	CO2 :	Examine the physical structural parameters using the strain energy concepts.
			01CI0502	CO3 :	Develop the influence lines for indeterminate beams that helps in evaluating end reactions, shear force and bending moment at particular section for moving load
			01CI0502	CO4 :	Analyze indeterminate structure using matrix method
			01CI0503	CO1 :	Explain the importance of highway planning and fundamentals of traffic engineering.
			01CI0503	CO2 :	Identify the different properties of pavement materials and recommend the maintenance strategies for highway design.
			01CI0503	CO3 :	Plan a highway project considering aspects such as highway finance and road safety.
			01CI0503	CO4 :	Examine the various parameters of highway geometry and structural design of pavements.
			01CI0504	CO1 :	Understand the various sources of water, standards, and criteria for designated uses.
			01CI0504	CO2 :	Design of primary, secondary, and tertiary water treatment units.
			01CI0504	CO3 :	Design of conveyance systems for water supply schemes.
			01CI0504	CO4 :	Need and design of separate and combined sewerage systems.
			01CI0504	CO5 :	Design aspects, role and functioning of various primary and secondary wastewater treatment units.
			01CI0505	CO1 :	Make use of Drawing tools and command
			01CI0505	CO2 :	Construct Computer aided drawing for nodes and links in transportation project
			01CI0505	CO3 :	Analyze various influencing traffic parameters and prioritize them according to their effects
			01CI0505	CO4 :	Predict the optimized signal cycle as per traffic condition
			01CI0506	CO1 :	Identify the engineering related problems in the community
			01CI0506	CO2 :	Analyze and Design different solutions to resolve the problems of community.
			01CI0506	CO3 :	Apply economical solution to those problems in the field.
			01CI0509	CO1 :	To analyse the properties of the traffic parameters.
			01CI0509	CO2 :	To apply knowledge of various traffic surveys
			01CI0509	CO3 :	To design various traffic control devices.
			01CI0509	CO4 :	To analyse road safety as per IRC SP 88.
			01CR0501	CO1 :	Contrast and understand short pieces of business correspondence reports or proposals. (Understanding)
			01CR0501	CO2 :	Read and Categorize the extracts from business publications. Ask for the information required. (Analyzing)
			01CR0501	CO3 :	Listen to, understand and contribute to discussions in meetings. (Remembering)
			01CR0501	CO4 :	Prepare the presentation on a familiar topic. (Applying)

2021	CIVIL ENGINEERING	6	01CI0601	CO1 :	Understand the functioning and network of air transport and rail transport.
			01CI0601	CO2 :	identify important components of rail transport and air transport.
			01CI0601	CO3 :	analyze geometric component of rail transport and air transport.
			01CI0601	CO4 :	evaluate geometric design of various components of air transport and rail transport.
			01CI0602	CO1 :	To understand various philosophies for structural design
			01CI0602	CO2 :	To analyse and design various types of steel connection using bolts and weld.
			01CI0602	CO3 :	To design steel structural elements in accordance to IS 800
			01CI0602	CO4 :	To ensure limit state of collapse and serviceability for structural elements
			01CI0602	CO5 :	To design RCC flexural elements in accordance to IS 456
			01CI0602	CO6 :	To design column and footing subjected to axial loads according to IS 456.
			01CI0603	CO1 :	To evaluate to predict the stresses incurred on the soil due to overlaying of foundations.
			01CI0603	CO2 :	The process of compaction and its engineering performance in the field can be clearly understood
			01CI0603	CO3 :	Predict stability of the slop and Design of slopes that are required in the construction of embankment, earth dams and canals can be successfully applied
			01CI0603	CO4 :	To able to understand the phenomena of consolidation and able to calculate the settlement of foundation
			01CI0603	CO5 :	Able to calculate strength, compresibility and permeability parameters of soil as per relevant IS code and phenomena of earth pressure.
			01CI0603	CO6 :	Able to understand various engineering properties of soil
			01CI0604	CO1 :	To work out the amount of material required for various activities of the construction of infrastructural facilities
			01CI0604	CO2 :	To acquaint the students with types of contract and contracting terminologies involved in the projects, disputes and arbitration process.
			01CI0604	CO3 :	To drafting general specifications for civil works
			01CI0604	CO4 :	To Carry out the Bidding Process and Tendering Process.
			01CI0604	CO5 :	To illustrate the rate analysis and Valuation Process
			01CI0605	CO1 :	To identify the use and applicability of different types of equipment
			01CI0605	CO2 :	To analyze different types of deep foundation and its construction techniques
			01CI0605	CO3 :	To apply various techniques used in the construction of tall structure
			01CI0605	CO4 :	To apply the safety measures required on the construction site
			01CI0605	CO5 :	To differentiate various techniques used in the demolition of the structure
			01CI0605	CO6 :	To analyze different design parameters of the temporary structure
			01CI0606	CO1 :	Understand the modelling of various types of structures in STAAD PRO and ETABS.
			01CI0606	CO2 :	Apply the various types of loads to structures using STAAD PRO and ETABS.
			01CI0606	CO3 :	Analyze the concrete and steel structures using STAAD PRO and ETABS.
			01CI0606	CO4 :	Design the concrete and steel structures using STAAD PRO and ETABS.
			01CI0607	CO1 :	Identify the engineering related problems in the community
			01CI0607	CO2 :	Analyze and Design different solutions to resolve the problems of community.
			01CI0607	CO3 :	Apply economical solution to those problems in the field.
			01CI0608	CO1 :	List and generally explain the main sources of energy and their primary applications nationally and internationally



<b>2021</b>	<b>CIVIL ENGINEERING</b>	<b>6</b>	01CI0608	CO2 :	Demonstrate the challenges and problems associated with the use of various energy sources, including fossil fuels, with regard to future supply and the impact on the environment
			01CI0608	CO3 :	Understand effect of using these sources on the environment and climate
			01CI0608	CO4 :	Understand the Engineering involved in project compare energy demands and quantity of the resources.
			01CI0608	CO5 :	Collect and organize information on renewable energy technologies as a basis for further analysis and evaluation.
			01CI0608	CO6 :	To quantify energy demands and make comparisons among energy uses, resources, and technologies.

**Course Outcome**  
**Batch**  
**(2021-25)**  
**B.Tech. in Civil Engineering**

Batch	Stream	Sem	Subject Code	Sr No	Course Out Comes
2122	CIVIL ENGINEERING	1	01CI1101	CO1 :	Recognize importance of civil engineering and its day to day applications
			01CI1101	CO2 :	Interpret the plan/map; locate the objects on ground from map and from site to on paper plan/map.
			01CI1101	CO3 :	Describe qualitative comparison between different materials and its selection.
			01CI1101	CO4 :	Create & interpret building planning and will be able to draw plan, section and elevation.
			01CI1101	CO5 :	Acquaint with the various modes of transportation.
			01CR1103	CO1 :	Understand importance of role of Values in developing self
			01CR1103	CO2 :	Inculcate right values, ethics, attitudes, manners and behaviours for life
			01CR1103	CO3 :	Respond and relate with expectations, competitions and power of networking
			01CR1103	CO4 :	Contribute in building a healthy nation
			01CR1103	CO5 :	Understand the significance of having appropriate attitude and balance towards work life as well as personal life.
			01EN1101	CO1 :	Understand and realize the multidisciplinary nature of Environment and its components.
			01EN1101	CO2 :	Know the importance of natural resources for the sustainable development of life.
			01EN1101	CO3 :	Understand the effect of growing population on the Environment.
			01EN1101	CO4 :	Classify the different types of pollution and measure to control pollution
			01EN1101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
			01GS2101	CO1 :	Obtain knowledge about various Non-Destructive-Testing methods and use it in various engineering fields.
			01GS2101	CO2 :	Acquire knowledge about various crystal structures and important properties of different materials.
			01GS2101	CO3 :	Understand basic properties of superconducting materials and check its industrial applications.
			01GS2101	CO4 :	Prepare Nano materials and use it for various engineering applications
			01MA2101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
			01MA2101	CO2 :	Apply and solve first order differential equations to real life problems
			01MA2101	CO3 :	Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
			01MA2101	CO4 :	Apply Multiple Integral to evaluate the Surface Area and Volume of any 3D objects.
			01MA2101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
			01MA2101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
			01ME1101	CO1 :	To understand the basic terminology of Mechanical systems.
			01ME1101	CO2 :	To able to make elementary calculations of ideal gases and steam.
			01ME1101	CO3 :	To understand working and construction of different boilers and mountings and accessories.
			01ME1101	CO4 :	To analyze the performance of I.C. engines.
			01ME1101	CO5 :	To understand working and construction of pump and various refrigeration cycles.
			01ME1101	CO6 :	To understand various power transmission elements.
			01SL0102	CO0 :	To enhance reading skills for academic purposes.
			01SL0102	CO1 :	To enhance reading skills for academic purposes
			01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes

2122	CIVIL ENGINEERING	1	01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
			01SL0102	CO4 :	To express their ideas in formal, academic written form
			01SL0103	CO1 :	Develop speaking competence for academic purpose
			01SL0103	CO2 :	Speak on a given topic in the context of technology
			01SL0103	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements
			01SL0103	CO4 :	Enhance the ability to make a presentation on a given topic
		2	01CE1101	CO1 :	Able to explain programming problems logically through flow charts and algorithms.
			01CE1101	CO2 :	Identify programming principles using C Language.
			01CE1101	CO3 :	Demonstrate problem solving skills through C Language.
			01CE1101	CO4 :	Generate computer-based solution for real time problem using programming language.
			01CE1101	CO5 :	Develop confidence to self-educate new programming languages.
			01EE1101	CO1 :	Analyze electrical circuits with different elements
			01EE1101	CO2 :	Apply principle of electromagnetic for electromechanical energy conversion in machines
			01EE1101	CO3 :	Choose a semiconductor circuit based on a given application.
			01EE1101	CO4 :	Describe the operation of various OpAmp circuits.
			01EE1101	CO5 :	Define the role of electrical apparatus used in household applications
			01MA0103	CO1 :	Apply vectors in higher dimensional space in experimental data, graphical images, civil and mechanical systems.
			01MA0103	CO2 :	apply System of linear equations in solving the problems of electrical and mechanical engineering, applied mechanics etc.
			01MA0103	CO3 :	Apply the concept of Eigen values and vectors in various field of engineering like control theory, vibration analysis, quantum mechanics etc.
			01MA0103	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
			01ME1102	CO1 :	Know, understand and able to define the methods of engineering drawing
			01ME1102	CO2 :	Learn basic sketching methods
			01ME1102	CO3 :	Understand engineering drawings using fundamental mathematics
			01ME1102	CO4 :	Construct Engineered Drawing
			01ME1102	CO5 :	Develop visualization skills so that they can create new product design
			01ME1102	CO6 :	Understand the theory of projection, Learn technical communication skill
			01ME1104	CO1 :	Apply knowledge of hand tools, power tools and safety related rules and regulations
			01ME1104	CO2 :	Apply knowledge of conventional machining processes
			01ME1104	CO3 :	Apply knowledge of advanced manufacturing processes
			01ME1104	CO4 :	Apply knowledge of manufacturing processes of composite materials
			3	01CI1301	CO1 :
		01CI1301		CO2 :	To identify centroid, Center of Gravity, Center of Mass and moment of inertia of simple and complex geometrical Shapes.
		01CI1301		CO3 :	To determine different types of stresses and strains developed in the Member subjected to axial, bending, shear, torsion & thermal loads.
		01CI1301		CO4 :	To determine stresses in thin cylinders and spherical vessels.

2122	CIVIL ENGINEERING	3	01CI1302	CO1 :	Discuss various aspects of principles of planning and architecture in planning building and mass composition.
			01CI1302	CO2 :	Interpret the technical terminologies related to planning and various conventional signs and symbols used in drawing the plans
			01CI1302	CO3 :	Prepare working drawings, foundation plans, and other executable drawings with proper details for residential buildings
			01CI1302	CO4 :	Draw perspective, orthographic, cross-sectional, and elevation drawing of the building by imagination
			01CI1303	CO1 :	Understand basic principles of various methods of surveying
			01CI1303	CO2 :	Obtain the included angles, latitude and departure of the traverse lines on the field
			01CI1303	CO3 :	Set the different types of curves on the field during survey work
			01CI1303	CO4 :	Analyze, calculate and measure the area and volumes of the different capacities and topographical situations
			01CI1304	CO1 :	Identify the properties of different types of fluids
			01CI1304	CO2 :	Measure the pressure and hydrostatic force generated by fluid.
			01CI1304	CO3 :	Categorize various types of fluid flow through conduits
			01CI1304	CO4 :	Evaluate the buoyancy force for the floating and immersed bodies in fluid
			01CI1305	CO1 :	Make use of Drawing tools and command
			01CI1305	CO2 :	Construct Computer aided drawing in civil engineering project
			01CI1305	CO3 :	Examine the role of different parameter used in Software application for Civil Engineering and its benefits
			01CI1305	CO4 :	Prepare working drawings, foundation plans and other executable drawings with proper details for residential buildings, commercial and institutional buildings
			01CR0303	CO1 :	After completion of this course, students will be able to Inculcate smart approach in logical problem solving.
			01CR0303	CO2 :	After completion of this course, students will be able to build a strong base in the fundamental logical concepts.
			01CR0303	CO3 :	After completion of this course, students will be able to grasp the approaches and strategies to solve problems with speed and accuracy.
			01CR0303	CO4 :	After completion of this course, students will be able to use logical deductions to make effective decisions.
			01CR0303	CO5 :	After completion of this course, students will be able to categorize various types of questions in terms of difficulty levels
			01MA1301	CO1 :	Apply Laplace transform and Fourier series to solve differential equations.
			01MA1301	CO2 :	Classify and apply the standard methods to solve ordinary differential equations.
			01MA1301	CO3 :	Expand various functions in terms of sine and cosine functions.
			01MA1301	CO4 :	Apply partial differential equations in engineering problems.
			01OE0001	CO1 :	Able to explain programming problems logically through flow charts and algorithms.
			01OE0001	CO2 :	Identify programming principles using C Language.
			01OE0001	CO3 :	Demonstrate problem solving skills through C Language.
			01OE0002	CO1 :	Familiar with the applications of Python and write python programs. and Describe the Python programming language.
			01OE0002	CO2 :	Use variables to store, retrieve and calculate the information of real-world problems and Utilise core programming tools such as functions and loops for problem-solving
			01OE0003	CO1 :	Differentiate between various types of energy sources.

<b>2122</b>	<b>CIVIL ENGINEERING</b>	<b>3</b>	010E0003	CO2 :	Identify challenges and strength of various energy convention technologies
			010E0003	CO3 :	Analyse solar and wind energy technologies from system perspective.
			010E0003	CO4 :	Understand the various route to generate energy from biomass and other renewable resources
			010E0003	CO5 :	Articulate various challenges associated with use of renewable energy sources.
			010E0004	CO1 :	Understand the consequence of technology on industry
			010E0004	CO2 :	Identify the need of industry in 21st century
			010E0004	CO3 :	Understanding the shaping technology of Industry 4.0.
			010E0004	CO4 :	Roadmap for implementation industry 4.0
			010E0004	CO5 :	Application of various key technologies of Industry 4.0
			010E0007	CO1 :	Build knowledge about the need and importance of disaster management in the concerned field
			010E0007	CO2 :	Understand the causes of Natural and Manmade disasters
			010E0007	CO3 :	Discuss the mitigation measures for Natural and Manmade disasters
			010E0007	CO4 :	Understand the importance of science and technology in disaster risk management
			010E0007	CO5 :	Apply the concept of Disasters management for realization of the responsibilities to society
			020E0004	CO1 :	Understand the significance of large data sets and use them to validate mathematically the empirical phenomena.
			020E0004	CO2 :	Apply various statistical tools to obtain the results on the basis of theoretical concepts.
			020E0004	CO3 :	Analyze the graphical interpretation of the data sets and make valid inference.
			020E0004	CO4 :	Evaluate mathematically using appropriate identities, the large data sets and make valid conclusions.
			020E0004	CO5 :	Study the mathematical aspects and behavior of the data, by creating new data sets, and exploring new mathematical results.
			040E0001	CO1 :	Understand basics of accounting and cost concepts
			040E0001	CO2 :	To have knowledge of process of accounting;
			040E0001	CO3 :	To prepare final accounts of sole proprietor
			040E0001	CO4 :	Understand and evaluate concept of depreciation and its methods
			040E0003	CO1 :	Understand the fundamentals of Investments
			040E0003	CO2 :	Evaluate various investments alternatives.
			040E0003	CO3 :	Comprehend the implication of insurance in managing the risk of life and health
			040E0003	CO4 :	Apply the understanding of financial investment Personal Financial planning.
			040E0006	CO1 :	Understand the Digital Marketing Environment for business.
			040E0006	CO2 :	Compare and analyze various tools of Digital Marketing.
			040E0006	CO3 :	Understand Digital Display Ads, blogs and social media.
			040E0006	CO4 :	Comprehend the idea SEO & and their analytics.
			040E0007	CO1 :	Acquire a fair degree of proficiency in comprehending statistical data, processing, and analyzing it.
			040E0007	CO2 :	Apply various measures of central tendency and measures of dispersion in data analysis.
			040E0007	CO3 :	Analyze the relationship between two variables using concepts of correlation and regression and its use in prediction.
040E0008	CO1 :	Understanding the concept, types, competencies of entrepreneur, problems of SSI, the policies, management of small business and schemes of SSI in India			
040E0008	CO2 :	Explain problems faced by entrepreneurs and Capacity Building for Entrepreneurs			



2122	CIVIL ENGINEERING	3	04OE0008	CO3 :	Identify business opportunities and understand the procedure for setting up of small-scale business unit
			04OE0008	CO4 :	Understand the importance and use of a Business Plan
			05OE0001	CO1 :	Understand Cybercrime and terminologies of cyber security
			05OE0001	CO2 :	Evaluate impact of attacks
			05OE0001	CO3 :	Analyze system and network security vulnerabilities.
			05OE0001	CO4 :	Implement and evaluate different tools for cybercrime attacks
			05OE0001	CO5 :	Analyze cyber fraud impact in digital era
			10OE0001	CO1 :	Students will be able to distinguish between the different types of laws.
			10OE0001	CO2 :	To understand the intricacies of Civil and Criminal Law.
			10OE0001	CO3 :	To discuss the importance of the fundamental concepts underlying Indian law.
			10OE0001	CO4 :	To comprehend the importance of Information and Consumer Laws in the Country and will be able to know the remedies in relation to any violation of their rights.
			10OE0002	CO1 :	To evaluate and remember the basic elements of forming an enforceable contract and agreement
			10OE0002	CO2 :	To evaluate and analyse the types of companies and its management.
			10OE0002	CO3 :	To analyse and understand the importance of Promoters and Directors in a company
			10OE0002	CO4 :	To understand and remember the basics of consumer law and Tax liabilities.
			10OE0003	CO1 :	To understand the fundamental aspects of Intellectual property Rights to students who are going to play a major role in development and management of innovative projects in industries.
			10OE0003	CO2 :	To discuss the law on patents, the patent regime in India and its registration aspects.
		10OE0003	CO3 :	To analyse the law relating copyrights and its related rights and registration aspects	
		10OE0003	CO4 :	To explain the law relating to trademarks and registration aspects	
		10OE0003	CO5 :	To demonstrate the concept of designs and legal issues involved in the same.	
		17OE0001	CO0 :	students should be able to perform basic fitness assessment & should understand basic cardiovascular, musculoskeletal and neurological conditions	
		4	01CI0408	CO1 :	Importance of creativity, problem solving and innovation while addressing science, engineering and social issues.
			01CI0408	CO2 :	Demonstrate the ability to contextualize knowledge related to professional engineering practices.
			01CI0408	CO3 :	Demonstrate the functioning effectively as an individual and team member.
			01CI0408	CO4 :	Ability to engage in life-long learning in the context of technological change
			01CI0409	CO1 :	Recognize the related entities involved in the building construction process.
			01CI0409	CO2 :	Identify the factors to be considered in the planning and construction of buildings.
			01CI0409	CO3 :	Understand the practices and techniques for construction works.
			01CI0409	CO4 :	Able to apply learning to further research in sustainable civil engineering materials, construction technology and construction management field.
			01CI1402	CO1 :	Classify structures and apply principles of statics to analyze statically determinate structures
			01CI1402	CO2 :	Analyze the determinate structures i.e., beam, frame, truss, arches, and cable, and draw its internal force diagram.
			01CI1402	CO3 :	Evaluate displacement and slope in determinate beams by different methods.
			01CI1402	CO4 :	Compute buckling load for long columns with different end conditions using Rankine's and Euler's theory.

<b>2122</b>	<b>CIVIL ENGINEERING</b>	<b>4</b>	01CI1402	CO5 :	Compute strain energy stored in a body due to the application of axial, shear, bending, and torsional forces.
			01CI1403	CO1 :	Understand the formation of the rock and soil as well as classify them according to Indian standards.
			01CI1403	CO2 :	Identify the soil, rock and its minerals by simple field testing and observations.
			01CI1403	CO3 :	Determine the index and engineering properties of rock and soil
			01CI1403	CO4 :	Understand the cause and effects of earthquake and volcanoes
			01CI1403	CO5 :	Analyse the project site based on geological investigation for given project.
			01CI2401	CO1 :	Understand features of special concrete and concreting methods
			01CI2401	CO2 :	Analyze the engineering properties of Civil Engineering materials like aggregate, cement, concrete, steel, wood, plastic, paints, and other materials.
			01CI2401	CO3 :	Identify, Describe and carry out lab tests relevant to use of civil engineering materials on site.
			01CI2401	CO4 :	Ensure the quality of engineering materials on site.
			01CI2401	CO5 :	Interpret the behavior of concrete in its fresh and hardened state with respect to its strength and durability aspects.
			01CI2401	CO6 :	Design concrete mix according to given conditions as per IS Code
			01CR0401	CO1 :	Express the basics of human values.
			01CR0401	CO2 :	Articulate human values and grow as responsible human beings in the society.
			01CR0401	CO3 :	Develop ethical conduct and deliver their professional duties.
			01CR0401	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level.
			01MA1401	CO1 :	Compute solutions of algebraic and transcendental equations by numerical methods.
			01MA1401	CO2 :	Apply methods of interpolation and curve fitting for prediction.
			01MA1401	CO3 :	Student able to apply ordinary differential equation and numerical integration in engineering problems.
			01MA1401	CO4 :	Use numerical methods and tools in the engineering problem-solving process.
			01MA1401	CO5 :	Analyze limit, continuity and differentiation of functions of complex variables and use Cauchy's integral theorem and formula to compute line integrals.
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<b>2122</b>	<b>CIVIL ENGINEERING</b>	<b>4</b>	010E0007	CO4 :	Understand the importance of science and technology in disaster risk management
			010E0007	CO5 :	Apply the concept of Disasters management for realization of the responsibilities to society
			010E0008	CO1 :	Understand application-based programming concept
			010E0008	CO2 :	To create programs for various open-source programmable boards
			010E0008	CO3 :	To develop programs for specific requirements with interfacing of various components and modules
			010E0008	CO4 :	To develop hardware and software interfacing for engineering applications
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			050E0001	CO5 :	Analyze cyber fraud impact in digital era



**Marwadi**  
University  
Marwadi Chandarana Group

Master of Technology  
Department of Electrical Engineering

**Course Outcome**

**Batch**

**(2019-20)**

**M.Tech. in Electrical Engineering**

Batch	Stream	Sem	Subject Code	Sr No	Course Out Comes
1920	ELECTRICAL Engineering	1	01EV0101	CO1 :	design electric vehicle & HEV for various applications
			01EV0101	CO2 :	select appropriate motor and converter for EV applications
			01EV0101	CO3 :	select battery, battery indication system for EV applications
			01EV0101	CO4 :	develop battery charger for an EV
			01EV0103	CO1 :	To present a problem oriented in-depth knowledge of Vehicle Dynamics
			01EV0103	CO2 :	To address the underlying concepts and methods behind Vehicle Dynamics
			01EV0103	CO3 :	To breakdown the dynamics of vehicle ride under different riding conditions
			01EV0103	CO4 :	To Calculate and refer the loads and forces associated to the vehicles.
			01EV0103	CO5 :	To Analyze the behavior of the vehicle under acceleration, ride and braking
			01EV0104	CO1 :	Choose an area and topic of their interest and define a research Problem
			01EV0104	CO2 :	Perform preliminary literature review and recognize the need of the solution.
			01EV0104	CO3 :	Develop preliminary solution in the domain of electric vehicle.
			01EV0104	CO4 :	Develop the preliminary simulation or laboratory prototype of the project.
			01EV0105	CO1 :	Understand how the soft computing techniques can be used for solving the problems
			01EV0105	CO2 :	Design of ANN based systems for function approximation in signal estimation for
			01EV0105	CO3 :	Apply the algorithms of deep learning in problem of control power quality
			01EV0105	CO4 :	Design of Fuzzy based systems for load frequency control in power systems
			01EV0105	CO5 :	Develop and evaluate control systems required in operations of power electronics
			01PEED0101	CO1 :	Differentiate between operational behaviour of IGBT and MOSFET and applications of devices
			01PEED0101	CO2 :	Analyze performance parameters of uncontrolled and controlled rectifiers
			01PEED0101	CO3 :	Critically evaluate different PWM schemes of Voltage Source Inverters
			01PEED0101	CO4 :	Design different switched mode power supplies
			01PEED0101	CO5 :	Develop a typical driver for power electronic switch
			01SL0501	CO1 :	Understand meaning and types of research, and approaches.
			01SL0501	CO2 :	Apply basic instrumentation and data collection methods
			01SL0501	CO3 :	Compare parameter estimation and related modelling methods
			01SL0501	CO4 :	Identify research problem along with its specification in terms of objectives,
			01SL0501	CO5 :	Design research proposal, devise and design an experimentation set-up
		2	01EV0201	CO1 :	Elaborate AC to DC converter for EV battery charging
			01EV0201	CO2 :	Elaborate isolated and non isolated DC-DC converter for EV battery charging
			01EV0201	CO3 :	Analyze impact of battery charging converter on power system.
			01EV0201	CO4 :	develop battery charger for an EV
			01EV0202	CO1 :	Understand different standards related to electric vehicles
			01EV0202	CO2 :	Understand type testing of electric vehicle
			01EV0202	CO3 :	Understand charging standard, retro-fitment standards etc.
			01EV0202	CO4 :	Understand the different government policies available for EV testing.
			01EV0203	CO1 :	Understand requirement of EV motors
			01EV0203	CO2 :	Understand suitability of electric motor & their control
			01EV0203	CO3 :	Understand speed control of Induction motor
			01EV0203	CO4 :	Understand PWM techniques of Inverter for Induction motor
			01EV0203	CO5 :	Understand different sensors and sensorless operation of motor
			01EV0204	CO1 :	Examine the feasibility of existing solution.
			01EV0204	CO2 :	Critically evaluate two different methods of problem solving.
			01EV0204	CO3 :	Analyze the methodology of the solution proposed in the literature review.
			01EV0204	CO4 :	Identify the gap in the proposed solution from application perspective.
			01EV0205	CO0 :	Select appropriate motor for EV applications.
			01EV0205	CO1 :	To introduce the importance of computer aided design method
			01EV0205	CO2 :	Implement equations in software program. (Apply)
			01EV0205	CO3 :	Create software-based design of DC Motor, Induction Motor & Special Electric Motor
			01EV0205	CO4 :	Analysis of machine part with FEM(Analyze)
			01EV0205	CO5 :	Prepare GUI for design of electrical machines.(Create)
			01PEED0209	CO1 :	Develop Program to control different General Purpose I/O peripherals

		01PEED020 9	CO2 :	Differentiate among the applications of peripherals of DSP controller
		01PEED020 9	CO3 :	Develop a program to Acquire signal through ADC
		01PEED020 9	CO4 :	Design an algorithm for Power Electronics based system and control of Motor
	<b>3</b>	01ES0305	CO1 :	Understand and realize the multi-disciplinary nature of the environment and global
		01ES0305	CO2 :	To compare the human population growth and its trend to the environmental
		01ES0305	CO3 :	Develop the awareness about his/her role towards environmental protection and
		01ES0305	CO4 :	Identify different types of environmental pollution and control measures.
		01ES0305	CO5 :	To correlate the exploitation and utilization of conventional and non-conventional
		01EV0301	CO1 :	Distinguish between construction, working and characteristics of various advanced
		01EV0301	CO2 :	Identify the suitable advance motor for EV application
		01EV0301	CO3 :	To design control scheme for control of advanced electrical machine.
		01EV0301	CO4 :	Identify the application of special manufactured machine in heavy electric vehicles
		01EV0303	CO1 :	Appreciate the limitation of work reported in literature or domain
		01EV0303	CO2 :	Select, defend, and apply a methodological approach for problems and solutions
		01EV0303	CO3 :	Obtain or simulate data relevant to the research question and analyze it.
		01EV0303	CO4 :	Evaluate the performance of the system with appropriate techniques.
		01EV0304	CO1 :	Understand the vision of IoT from a global context.
		01EV0304	CO2 :	Implementation the different sensors used in EV by using IoT.
		01EV0304	CO3 :	Determine the Market perspective of IoT.
		01EV0304	CO4 :	Use of Devices, Gateways and Data Management in IoT.
		01EV0304	CO5 :	Building state of the art architecture in IoT.
		01EV0304	CO6 :	Application of IoT in Electric Vehicle.
	<b>4</b>	01EV0401	CO1 :	Assess the strength and drawbacks of various methodological approaches relevant to
		01EV0401	CO2 :	Verify the feasibility of different methods in development environment
		01EV0401	CO3 :	Simulate base method which has limitation and scope of improvement
		01EV0401	CO4 :	Design and implement the relevant solution in the research project to prove the



**Marwadi**  
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Master of Technology  
Department of Electrical Engineering

**Course Outcome**

**Batch**

**(2020-21)**

**M.Tech. in Electrical Engineering**

Batch	Stream	Sem	Subject Code	Sr No	Course Out Comes
2021	ELECTRICAL ENGINEERING	1	01EV0104	CO1 :	Choose an area and topic of their interest and define a research Problem
			01EV0104	CO2 :	Perform preliminary literature review and recognize the need of the solution.
			01EV0104	CO3 :	Develop preliminary solution in the domain of electric vehicle.
			01EV0104	CO4 :	Develop the preliminary simulation or laboratory prototype of the project.
			01EV1101	CO1 :	Differentiate among different types of Electric and Hybrid Vehicles and their
			01EV1101	CO2 :	Decide suitable electric propulsion system for EV and HEV.
			01EV1101	CO3 :	Determine the rating of energy source requirement of EV and HEV.
			01EV1101	CO4 :	Analyse the role of auxiliaries in Electric and Hybrid Vehicles.
			01PEED0102	CO1 :	To familiar about characteristics and operation of electrical drive and four quadrant operation.
			01PEED0102	CO2 :	To analyze performance of DC - DC converter fed DC motor drive.
			01PEED0102	CO3 :	To analyze performance of AC -DC converter fed DC motor drive
			01PEED0102	CO4 :	To evaluate performance of advanced control method for Induction motor drive.
			01PEED0102	CO5 :	To analyze the operation and performance of PMSM drive
			01PEED0103	CO1 :	Analyse an equivalent circuit model of switched mode power supply for steady-state analysis.
			01PEED0103	CO2 :	Design of magnetic components (i.e., inductor and transformer) for converters used in power
			01PEED0103	CO3 :	Compare the operation of resonance switching power converters with traditional converters.
			01PEED0103	CO4 :	Develop feedback controller to regulate DC output of power supply and obtain it frequency
			01PEED0103	CO5 :	Analyse the performance of SMPS with various input filters.
			01PEED0109	CO1 :	Develop a mathematical model of different electrical machine
			01PEED0109	CO2 :	Design simulation of a developed mathematical model of the machine in software
		01PEED0109	CO3 :	Analyse the generalised performance of machine in software	
		01PEED0109	CO4 :	Analyse the performance of machine under various dynamics condition	
		01PEED1101	CO1 :	Differentiate between operational behaviour of IGBT and MOSFET and applications of devices. (Analyze)	
		01PEED1101	CO2 :	Analyze performance parameters of uncontrolled and controlled rectifiers. (Analyze)	
		01PEED1101	CO3 :	Evaluate different PWM schemes of Voltage Source Inverters. (Evaluate)	
		01PEED1101	CO4 :	Design different switched mode power supplies. (Create)	
		01PEED1101	CO5 :	Develop a typical driver for power electronic switch. (Apply)	
		01PEED1105	CO1 :	Distinguish between construction, working and characteristics of various advanced electrical machines.	
		01PEED1105	CO2 :	Able to understand the principle of operation of control strategy for advanced electrical machines.	
		01PEED1105	CO3 :	Application of different advanced electrical machines.	
		01PEED1105	CO4 :	Application of modeling software to analyze the performance of Electrical machines.	
		2	01EV0207	CO1 :	Differentiate among different special machines for electric vehicle application
			01EV0207	CO2 :	Evaluate the performance of special machines for EVs
			01EV0207	CO3 :	Determine the special machine and their drive requirement for EV application
			01EV0207	CO4 :	Analyze the performance of multiphase machine for EVs
			01EV1201	CO1 :	Interpret the role of battery management system
			01EV1201	CO2 :	Identify the requirements of Battery Management System
			01EV1201	CO3 :	Interpret the concept associated with battery charging / discharging process
			01EV1201	CO4 :	Calculate the various parameters of battery and battery pack
			01EV1201	CO5 :	Design the model of battery pack
01EV1203	CO1 :		Elaborate various grid connected converter for EV battery charging.		
01EV1203	CO2 :		Analyze impact of battery charging converter on power system		
01EV1203	CO3 :		Analyse the operation of various resonant converters for EV charging system		
01EV1203	CO4 :	Develop battery charger for an EV			
01EV1204	CO1 :	Examine the feasibility of existing solution.			



		01EV1204	CO2 :	Critically evaluate two different methods of problem solving.
		01EV1204	CO3 :	Analyze the methodology of the solution proposed in the literature review.
		01EV1204	CO4 :	Identify the gap in the proposed solution from application perspective.
		01PEED020 9	CO1 :	Develop Program to control different General Purpose I/O peripherals
		01PEED020 9	CO2 :	Differentiate among the applications of peripherals of DSP controller
		01PEED020 9	CO3 :	Develop a program to Acquire signal through ADC
		01PEED020 9	CO4 :	Design an algorithm for Power Electronics based system and control of Motor
		01PEED120 1	CO1 :	Model the induction motor in different reference frames
		01PEED120 1	CO2 :	Develop the vector control of induction motor drive for high performance application
		01PEED120 1	CO3 :	Select the method for estimating the speed for sensor less vector control
		01PEED120 1	CO4 :	Compare the Performance of Vector Control and Direct Torque Controlled Drives
		01PEED120 1	CO5 :	Identify the role of open end winding and multiphase machine in heavy electric vehicle.
		01SL0501	CO1 :	Understand meaning and types of research, and approaches.
		01SL0501	CO2 :	Apply basic instrumentation and data collection methods
		01SL0501	CO3 :	Compare parameter estimation and related modelling methods
		01SL0501	CO4 :	Identify research problem along with its specification in terms of objectives,
		01SL0501	CO5 :	Design research proposal, devise and design an experimentation set-up
	<b>3</b>	01ES0305	CO1 :	Understand and realize the multi-disciplinary nature of the environment and global
		01ES0305	CO2 :	To compare the human population growth and its trend to the environmental
		01ES0305	CO3 :	Develop the awareness about his/her role towards environmental protection and
		01ES0305	CO4 :	Identify different types of environmental pollution and control measures.
		01ES0305	CO5 :	To correlate the exploitation and utilization of conventional and non-conventional
		01EV0301	CO1 :	Distinguish between construction, working and characteristics of various advanced
		01EV0301	CO2 :	Identify the suitable advance motor for EV application
		01EV0301	CO3 :	To design control scheme for control of advanced electrical machine.
		01EV0301	CO4 :	Identify the application of special manufactured machine in heavy electric vehicles
		01EV0303	CO1 :	Appreciate the limitation of work reported in literature or domain
		01EV0303	CO2 :	Select, defend, and apply a methodological approach for problems and solutions
		01EV0303	CO3 :	Obtain or simulate data relevant to the research question and analyze it.
		01EV0303	CO4 :	Evaluate the performance of the system with appropriate techniques.
		01EV0304	CO1 :	Understand the vision of IoT from a global context.
		01EV0304	CO2 :	Implementation the different sensors used in EV by using IoT.
		01EV0304	CO3 :	Determine the Market perspective of IoT.
		01EV0304	CO4 :	Use of Devices, Gateways and Data Management in IoT.
		01EV0304	CO5 :	Building state of the art architecture in IoT.
		01EV0304	CO6 :	Application of IoT in Electric Vehicle.
		01PEED030 1	CO1 :	Appreciate the limitation of work reported in literature or domain
		01PEED030 1	CO2 :	Select, defend, and apply a methodological approach for problems and solutions available in the literature
		01PEED030 1	CO3 :	Obtain or simulate data relevant to the research question and analyze it.
		01PEED030 1	CO4 :	Simulate base method which has limitation and scope of improvement
		01SL0302	CO1 :	To enhance communicative competence with reference to technical communication
		01SL0302	CO2 :	To articulate their ideas effectively in terms of speaking in a formal or professional
		01SL0302	CO3 :	To produce or write effective technical documents
		01SL0302	CO4 :	To acquire a degree of proficiency in the use of English in the oral and written form
	<b>4</b>	01EV0401	CO1 :	Assess the strength and drawbacks of various methodological approaches relevant to
		01EV0401	CO2 :	Verify the feasibility of different methods in development environment
		01EV0401	CO3 :	Simulate base method which has limitation and scope of improvement
		01EV0401	CO4 :	Design and implement the relevant solution in the research project to prove the
		01PEED040 1	CO1 :	Assess the strength and drawbacks of various methodological approaches relevant to the research question
		01PEED040 1	CO2 :	Verify the feasibility of different methods in development environment.
		01PEED040 1	CO3 :	Design and implement the relevant solution in the research project to prove the feasibility of the solution.
		01PEED040 1	CO4 :	Develop a scientific report based on the work carried out in the project.



**Marwadi**  
University  
Marwadi Chandarana Group

Master of Technology  
Department of Electrical Engineering

**Course Outcome**

**Batch**

**(2021-22)**

**M.Tech. in Electrical Engineering**

Batch	Stream	Sem	Subject Code	Sr No	Course Out Comes
2122	ELECTRICAL ENGINEERING	1	01EV1102	CO1 :	Differentiate among different types of Electric and Hybrid Vehicles and their
			01EV1102	CO2 :	Decide suitable electric propulsion system for EV and HEV.
			01EV1102	CO3 :	Determine the rating of energy source requirement of EV and HEV.
			01EV1102	CO4 :	Analyse the role of auxiliaries in Electric and Hybrid Vehicles.
			01EV1103	CO1 :	Illustrate the construction features of different electrical machine (Apply)
			01EV1103	CO2 :	Explain different method to control the speed of motor. (Analyze)
			01EV1103	CO3 :	Analyze the torque speed characteristics of motor. (Create)
			01EV1103	CO4 :	Selection of motor for specific application (Evaluate)
			01EV1103	CO5 :	Method to develop the maximum torque in motor(Apply)
			01EV1105	CO1 :	Analyse an equivalent circuit model of switched mode power supply for steady-state
			01EV1105	CO2 :	Design of magnetic components (i.e., inductor and transformer) for converters used
			01EV1105	CO3 :	Compare the operation of resonance switching power converters with traditional
			01EV1105	CO4 :	Develop feedback controller to regulate DC output of power supply and obtain it
			01EV1105	CO5 :	Analyse the performance of SMPS with various input filters
			01EV1108	CO1 :	Differentiate between operational behaviour of IGBT and MOSFET and applications of
			01EV1108	CO2 :	Analyze performance parameters of rectifiers. (Analyze)
			01EV1108	CO3 :	Evaluate different PWM schemes of Voltage Source Inverters. (Evaluate)
			01EV1108	CO4 :	Design different switched mode power supplies. (Create)
			01EV1108	CO5 :	Develop a typical driver for power electronic switch. (Apply)
			01EV1109	CO1 :	Develop mathematical model of different electrical machine.
			01EV1109	CO2 :	Design mathematical model of machine in software tool
			01EV1109	CO3 :	Analyse the generalised performance of machine in software
			01EV1109	CO4 :	Analyse the performance of machine under various dynamics condition
			01EV1110	CO1 :	Differentiate application of Analytical Vs Numerical techniques
			01EV1110	CO2 :	Apply the numerical methods for the performance analysis EV components.
			01EV1110	CO3 :	Simulate the EV components using software which supports FEM
			01EV1110	CO4 :	Analyse the performance of EV components by varying the design parameters
			2	01AU9002	CO1 :
		01AU9002		CO2 :	Inculcate right values, ethics, attitudes, manners and behaviors for life.
		01AU9002		CO3 :	Overall develop a sound personality.
		01AU9002		CO4 :	Imbibe values that translate in character building
		01EV1201		CO1 :	Interpret the role of battery management system
		01EV1201		CO2 :	Identify the requirements of Battery Management System
		01EV1201		CO3 :	Interpret the concept associated with battery charging / discharging process
		01EV1201		CO4 :	Calculate the various parameters of battery and battery pack
		01EV1201		CO5 :	Design the model of battery pack
		01EV1202		CO1 :	Model the induction motor in different reference frames
		01EV1202		CO2 :	Develop the vector control of induction motor drive for high performance application
		01EV1202		CO3 :	Select the method for estimating the speed for sensor less vector control.
		01EV1202		CO4 :	Compare the Performance of Vector Control and Direct Torque Controlled Drives
		01EV1202		CO5 :	Identify the role of open-end winding and multiphase machine in heavy electric
		01EV1203		CO1 :	Elaborate various grid connected converter for EV battery charging.
		01EV1203		CO2 :	Analyze impact of battery charging converter on power system
		01EV1203		CO3 :	Analyse the operation of various resonant converters for EV charging system
		01EV1203		CO4 :	Develop battery charger for an EV
		01EV1207		CO1 :	Differentiate among different special machines for electric vehicle application
		01EV1207		CO2 :	Evaluate the performance of special machines for EVs
		01EV1207		CO3 :	Determine the special machine and their drive requirement for EV application
		01EV1207		CO4 :	Analyze the performance of multiphase machine for EVs
		01EV1208	CO1 :	Develop Program to control different General Purpose I/O peripherals (Apply)	
01EV1208	CO2 :	Differentiate among the applications of peripherals of DSP controller(Analyze).			
01EV1208	CO3 :	Develop a program to Acquire signal through ADC (Apply).			
01EV1208	CO4 :	Design an algorithm for Power Electronics based system and control of Motor(Create).			
01SL1210	CO1 :	To understand the research and its types			
01SL1210	CO2 :	To differentiate between journal/proceeding and books and its authenticity			
01SL1210	CO3 :	To identify the quality indices for Journal & Authors			

		01SL1210	CO4 :	To differentiate the forms of IPR and its applications to engineering.
<b>3</b>		01AU9001	CO1 :	Understand the relevance of English in technical paper writing
		01AU9001	CO2 :	Develop wide writing patterns to increase the readability and understanding of papers
		01AU9001	CO3 :	Give inputs in sectional writing and enhancing the quality of reported work
		01AU9001	CO4 :	Understand the relevance of developing a catchy title
		01OE9002	CO1 :	Differentiate between various types of energy sources.
		01OE9002	CO2 :	Identify challenges and strength of various energy convention technologies
		01OE9002	CO3 :	Analyse solar and wind energy technologies from system perspective.
		01OE9002	CO4 :	Understand the various route to generate energy from biomass and other renewable
		01OE9002	CO5 :	Articulate various challenges associated with use of renewable energy sources.
		01OE9003	CO1 :	Understand Importance of Safety and Important related Acts.
		01OE9003	CO2 :	Apply Maintenance techniques as per requirements and able to compare for with
		01OE9003	CO3 :	Understand wear and corrosion, its causes and remedial actions for preventions.
		01OE9003	CO4 :	Demonstrate fault tracing, its methods and application.
		01OE9005	CO1 :	Understand the connection between climate change and human activities and the
		01OE9005	CO2 :	Discuss the policies and legislation of international and national legislative
		01OE9005	CO3 :	Apply sustainable development approach in industries.
		01OE9005	CO4 :	Identify ways of achieving sustainable goals



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Master of Technology  
Department of Electrical Engineering

**Course Outcome**

**Batch**

**(2019-20)**

**M.Tech. in Electrical Engineering**

Batch	Stream	Sem	Subject Code	Sr No	Course Out Comes
1920	ELECTRICAL ENGINEERING	1	01EV0101	CO1 :	design electric vehicle & HEV for various applications
			01EV0101	CO2 :	select appropriate motor and converter for EV applications
			01EV0101	CO3 :	select battery, battery indication system for EV applications
			01EV0101	CO4 :	develop battery charger for an EV
			01EV0105	CO1 :	Understand how the soft computing techniques can be used for solving the problems
			01EV0105	CO2 :	Design of ANN based systems for function approximation in signal estimation for
			01EV0105	CO3 :	Apply the algorithms of deep learning in problem of control power quality
			01EV0105	CO4 :	Design of Fuzzy based systems for load frequency control in power systems
			01EV0105	CO5 :	Develop and evaluate control systems required in operations of power electronics
			01PEED0101	CO1 :	Differentiate between operational behaviour of IGBT and MOSFET and applications of devices
			01PEED0101	CO2 :	Analyze performance parameters of uncontrolled and controlled rectifiers
			01PEED0101	CO3 :	Critically evaluate different PWM schemes of Voltage Source Inverters
			01PEED0101	CO4 :	Design different switched mode power supplies
			01PEED0101	CO5 :	Develop a typical driver for power electronic switch
			01PEED0102	CO1 :	To familiars about characteristics and operation of electrical drive and four quadrant operation.
			01PEED0102	CO2 :	To analyze performance of DC - DC converter fed DC motor drive.
			01PEED0102	CO3 :	To analyze performance of AC -DC converter fed DC motor drive
			01PEED0102	CO4 :	To evaluate performance of advanced control method for Induction motor drive.
			01PEED0102	CO5 :	To analyze the operation and performance of PMSM drive
			01PEED0109	CO1 :	Develop a mathematical model of different electrical machine
			01PEED0109	CO2 :	Design simulation of a developed mathematical model of the machine in software
		01PEED0109	CO3 :	Analyse the generalised performance of machine in software	
		01PEED0109	CO4 :	Analyse the performance of machine under various dynamics condition	
		01PEED0110	CO1 :	Analyze and design computational circuits	
		01PEED0110	CO2 :	Design an control system for an different application.	
		01PEED0110	CO3 :	Design and optimize simple synchronous sequential circuits	
		01PEED0110	CO4 :	Implement simple designs at various levels from discrete components to control circuits for desian.	
		01SL0501	CO1 :	Understand meaning and types of research, and approaches.	
		01SL0501	CO2 :	Apply basic instrumentation and data collection methods	
		01SL0501	CO3 :	Compare parameter estimation and related modelling methods	
		01SL0501	CO4 :	Identify research problem along with its specification in terms of objectives,	
		01SL0501	CO5 :	Design research proposal, devise and design an experimentation set-up	
		2	01EV0201	CO1 :	Elaborate AC to DC converter for EV battery charging
			01EV0201	CO2 :	Elaborate isolated and non isolated DC-DC converter for EV battery charging
			01EV0201	CO3 :	Analyze impact of battery charging converter on power system.
			01EV0201	CO4 :	develop battery charger for an EV
			01PEED0201	CO1 :	Analyze modeling of induction motor in different reference frames
			01PEED0201	CO2 :	Differentiate among methods of vector control of three phase induction motor
			01PEED0201	CO3 :	Analyze the behavior of high-performance induction Motor drives using the principles of DTC
			01PEED0201	CO4 :	Compare the Performance of Vector Control and Direct Torque Controlled Drives
			01PEED0201	CO5 :	Apply the model in Permanent Magnet and Switch Reluctance Motor drives
			01PEED0202	CO1 :	Understand the fundamentals of intelligent/smart control systems used for industrial automation.
			01PEED0202	CO2 :	Learn fundamentals and applications of digital control for multidisciplinary engineering problems.

		01PEED020 2	CO3 :	Apply digital control systems using stat-space concept to linear systems as well as nonlinear systems.
		01PEED020 2	CO4 :	Analyze discrete time system/control systems using Z-transform.
		01PEED020 2	CO5 :	Develop mathematical models for controlling system behavior of a discrete-time control svstem.
		01PEED020 2	CO6 :	Evaluate discrete-time control systems on the account of stability.
		01PEED020 6	CO1 :	Design control technique for grid connected PV & WT converter.(Create)
		01PEED020 6	CO2 :	Implement Grid synchronization technique for renewable energy system. (Evaluate)
		01PEED020 6	CO3 :	Design filters for Grid connected converters. (Apply)
		01PEED020 6	CO4 :	Design Energy Harvesting system for renewable energy sources. (Create)
		01PEED020 6	CO5 :	To Evaluate grid codes for grid connected system (Evaluate)
		01PEED020 9	CO1 :	Develop Program to control different General Purpose I/O peripherals
		01PEED020 9	CO2 :	Differentiate among the applications of peripherals of DSP controller
		01PEED020 9	CO3 :	Develop a program to Acquire signal through ADC
		01PEED020 9	CO4 :	Design an algorithm for Power Electronics based system and control of Motor
		01PEED021 0	CO1 :	Choose an area and topic of their interest and determine the relevant solution
		01PEED021 0	CO2 :	Perform a preliminary literature review and recognize the need for the relevant power electronic solution.
		01PEED021 0	CO3 :	Develop preliminary solution in the domain of power electronics or electrical drives.
		01PEED021 0	CO4 :	Perform preliminary simulation of the solution with the help of appropriate software tool.
	<b>3</b>	01PEED030 1	CO1 :	Appreciate the limitation of work reported in literature or domain
		01PEED030 1	CO2 :	Select, defend, and apply a methodological approach for problems and solutions available in the literature
		01PEED030 1	CO3 :	Obtain or simulate data relevant to the research question and analyze it.
		01PEED030 1	CO4 :	Simulate base method which has limitation and scope of improvement
		01SL0302	CO1 :	To enhance communicative competence with reference to technical communication
		01SL0302	CO2 :	To articulate their ideas effectively in terms of speaking in a formal or professional
		01SL0302	CO3 :	To produce or write effective technical documents
		01SL0302	CO4 :	To acquire a degree of proficiency in the use of English in the oral and written form
	<b>4</b>	01PEED040 1	CO1 :	Assess the strength and drawbacks of various methodological approaches relevant to the research question
		01PEED040 1	CO2 :	Verify the feasibility of different methods in development environment.
		01PEED040 1	CO3 :	Design and implement the relevant solution in the research project to prove the feasibility of the solution.
		01PEED040 1	CO4 :	Develop a scientific report based on the work carried out in the project.



**Marwadi**  
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Master of Technology  
Department of Electrical Engineering

**Course Outcome**

**Batch**

**(2020-21)**

**M.Tech. in Electrical Engineering**



Batch	Stream	Sem	Subject Code	Sr No	Course Out Comes
2021	ELECTRICAL ENGINEERING	3	01PEED030 1	CO1 :	Appreciate the limitation of work reported in literature or domain
			01PEED030 1	CO2 :	Select, defend, and apply a methodological approach for problems and solutions available in the literature
			01PEED030 1	CO3 :	Obtain or simulate data relevant to the research question and analyze it.
			01PEED030 1	CO4 :	Simulate base method which has limitation and scope of improvement
			01SL0302	CO1 :	To enhance communicative competence with reference to technical communication
			01SL0302	CO2 :	To articulate their ideas effectively in terms of speaking in a formal or professional
			01SL0302	CO3 :	To produce or write effective technical documents
			01SL0302	CO4 :	To acquire a degree of proficiency in the use of English in the oral and written form





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Master of Technology  
Department of Electrical Engineering

**Course Outcome**

**Batch**

**(2021-22)**

**M.Tech. in Electrical Engineering**

Batch	Stream	Sem	Subject Code	Sr No	Course Out Comes	
2122	ELECTRICAL ENGINEERING	1	01PE1101	CO1 :	Differentiate between operational behaviour of IGBT and MOSFET and applications of	
			01PE1101	CO2 :	Analyze performance parameters of uncontrolled and controlled rectifiers. (Analyze)	
			01PE1101	CO3 :	Evaluate different PWM schemes of Voltage Source Inverters. (Evaluate)	
			01PE1101	CO4 :	Design different switched mode power supplies. (Create)	
			01PE1101	CO5 :	Develop a typical driver for power electronic switch. (Apply)	
			01PE1102	CO1 :	Appreciate significance of speed-torque characteristics of electrical drives and	
			01PE1102	CO2 :	Evaluate the performance of AC Voltage Controller fed induction motor drive.	
			01PE1102	CO3 :	Implement VSI fed v/f controlled AC motor drive	
			01PE1102	CO4 :	Explain concept of Field Oriented Control of an induction motor.	
			01PE1102	CO5 :	Determine the speed control methods of synchronous motor based on application.	
			01PE1103	CO1 :	Analyse an equivalent circuit model of switched mode power supply for steady-state	
			01PE1103	CO2 :	Design of magnetic components (i.e., inductor and transformer) for converters used	
			01PE1103	CO3 :	Compare the operation of resonance switching power converters with traditional	
			01PE1103	CO4 :	Develop feedback controller to regulate DC output of power supply and obtain it	
			01PE1103	CO5 :	Analyse the performance of SMPS with various input filters.	
			01PE1106	CO1 :	Differentiate among different types of Electric and Hybrid Vehicles and their	
			01PE1106	CO2 :	Decide suitable electric propulsion system for EV and HEV.	
			01PE1106	CO3 :	Determine the rating of energy source requirement of EV and HEV.	
			01PE1106	CO4 :	Analyse the role of auxiliaries in Electric and Hybrid Vehicles.	
			01PE1108	CO1 :	Develop mathematical model of different electrical machine.	
			01PE1108	CO2 :	Design mathematical model of machine in software tool	
			01PE1108	CO3 :	Analyse the generalised performance of machine in software	
			01PE1108	CO4 :	Analyse the performance of machine under various dynamics condition	
			01PE1109	CO1 :	Differentiate application of Analytical Vs Numerical techniques.	
			01PE1109	CO2 :	Apply the numerical methods for the performance analysis EV components	
			01PE1109	CO3 :	Simulate the EV components using software which supports FEM	
			01PE1109	CO4 :	Analyse the performance of EV components by varying the design parameters	
			2	01PE1201	CO1 :	Compare the discrete control and continuous control of converters.
				01PE1201	CO2 :	Analyze and compare various digital control techniques.
				01PE1201	CO3 :	Apply various design approach for digital controller design.
		01PE1201		CO4 :	Implement the basic digital current control of Power electronic converter.	
		01PE1202		CO1 :	Model the induction motor in different reference frames	
		01PE1202		CO2 :	Develop the vector control of induction motor drive for high performance application	
		01PE1202		CO3 :	Select the method for estimating the speed for sensor less vector control	
		01PE1202		CO4 :	Compare the Performance of Vector Control and Direct Torque Controlled Drives	
		01PE1202		CO5 :	Identify the role of open end winding and multiphase machine in heavy electric	
		01PE1205		CO1 :	Design control technique for grid connected PV & WT converter.	
		01PE1205		CO2 :	Implement Grid synchronization technique for renewable energy system	
		01PE1205		CO3 :	Design filters for Grid connected converters.	
		01PE1205		CO4 :	Design Energy Harvesting system for renewable energy sources.	
		01PE1205		CO5 :	To Evaluate grid codes for grid connected system.	
		01PE1206		CO1 :	Identify, measure, detect various power quality issues in electrical system	
		01PE1206		CO2 :	Analyse the effect of harmonics and non-linearity on electrical equipment	
		01PE1206		CO3 :	Design and simulate shunt, series and hybrid active filters	
		01PE1206		CO4 :	Apply UPQC and DVR for mitigation of power quality issues	
		01PE1208		CO1 :	Develop Program to control different General Purpose I/O peripherals (Apply)	
		01PE1208		CO2 :	Differentiate among the applications of peripherals of DSP controller(Analyze).	
		01PE1208		CO3 :	Develop a program to Acquire signal through ADC (Apply).	
		01PE1208		CO4 :	Design an algorithm for Power Electronics based system and control of Motor(Create).	
		01SL1210		CO1 :	To understand the research and its types	
		01SL1210		CO2 :	To differentiate between journal/proceeding and books and its authenticity	
		01SL1210		CO3 :	To identify the quality indices for Journal & Authors	
		01SL1210		CO4 :	To differentiate the forms of IPR and its applications to engineering.	
		3		01AU9001	CO1 :	Understand the relevance of English in technical paper writing
01AU9001	CO2 :			Develop wide writing patterns to increase the readability and understanding of papers		
01AU9001	CO3 :			Give inputs in sectional writing and enhancing the quality of reported work		

			01AU9001	CO4 :	Understand the relevance of developing a catchy title
			01OE9002	CO1 :	Differentiate between various types of energy sources.
			01OE9002	CO2 :	Identify challenges and strength of various energy convention technologies
			01OE9002	CO3 :	Analyse solar and wind energy technologies from system perspective.
			01OE9002	CO4 :	Understand the various route to generate energy from biomass and other renewable
			01OE9002	CO5 :	Articulate various challenges associated with use of renewable energy sources.
			01OE9003	CO1 :	Understand Importance of Safety and Important related Acts.
			01OE9003	CO2 :	Apply Maintenance techniques as per requirements and able to compare for with
			01OE9003	CO3 :	Understand wear and corrosion, its causes and remedial actions for preventions.
			01OE9003	CO4 :	Demonstrate fault tracing, its methods and application.



**Marwadi**  
University

**Bachelor of Technology**

**Department of Automobile Engineering**

**Course Outcome**

**Batch**

**(216-17)**

**B.Tech. in Automobile Engineering**



Sem	Subject Code	Sr No	Course Out Comes
1	01CE0101	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
	01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
	01CE0101	CO3 :	Express and Distinguish various loops in C language (Analyze).
	01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures(Apply)
	01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
	01CE0101	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
	01CI0101	CO1 :	Recognize importance of Civil engineering and its day to day applications.
	01CI0101	CO2 :	Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
	01CI0101	CO3 :	Describe qualitative comparison between different materials and its selection.
	01CI0101	CO4 :	Analyse the water resources, its harvesting and its consumptive use.
	01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
	01CI0101	CO6 :	Acquaint with the various modes of transportation.
	01CR0101	CO1 :	Understands how to use different tools of language in order to communicate effectively.
	01CR0101	CO2 :	Applies appropriate grammatical structures and a wide range of vocabulary in spoken and written discourse.
	01CR0101	CO3 :	Choose appropriate alternatives in personal and professional life.
	01CR0101	CO4 :	Displaying the best of the professional attitude and behavior.
	01GS0101	CO1 :	To Interpret the mechanics of various types of sound waves -what they look like, how they are produced, interact with other sound waves and materials.
	01GS0101	CO2 :	To Describe the basic physical principles and applications of ultrasonic sound.
	01GS0101	CO3 :	To Discuss construction, principle of optical fiber communication. Analyze the structure and properties of lasers to their performance and intended applications .
	01GS0101	CO4 :	To Utilize the concept of superconductivity, magnetic and advanced engineering materials and their behaviors under various system conditions.
	01GS0101	CO5 :	To Explain the need of NDT and its methodologies. Illustrate the properties and mechanisms of nano physics.
	01GS0101	CO6 :	To demonstrate in the laboratory the ability to collect, analyze data and to prepare coherent reports of his or her findings
	01MA0101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
	01MA0101	CO2 :	apply and solve first order differential equations to real life problems
	01MA0101	CO3 :	.Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
	01MA0101	CO4 :	Apply partial differentiation to evaluate equations of tangent plane and normal line for given surface.
	01MA0101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
01MA0101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.	
01ME0101	CO1 :	Understand basic terminologies and fundamentals of mechanical system by correlating science concept.	
01ME0101	CO2 :	Apply the governing laws of mechanical engineering to find solution of different systems.	



	01ME0101	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.
	01ME0101	CO4 :	Identify functional characteristics of various mechanisms.
	01ME0101	CO5 :	Analyze the various energy conversion cycles and systems.
<b>2</b>	01EE0103	CO1 :	Recognize importance of electrical energy and its day to day applications. (Understand)
	01EE0103	CO2 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions. (Apply)
	01EE0103	CO3 :	Analyse and solve DC Circuits, AC Single phase and magnetic circuits. (Analyse)
	01EE0103	CO4 :	Explain the need of batteries, its characteristics and charging methods. (Remember/Knowledge)
	01EE0103	CO5 :	Perceive the detail understanding of construction, operation and applications of various components like Diode, BJT and Op-Amp. (Understand)
	01EE0103	CO6 :	Recognize basic electronic devices used in various circuits. (Understand)
	01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
	01EN0101	CO2 :	Know the importance of natural resources for the sustainable development of life.
	01EN0101	CO3 :	Understand the effect of growing population on the Environment.
	01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
	01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
	01MA0151	CO1 :	Explain the linear dependence of vectors of different vector space.
	01MA0151	CO2 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.
	01MA0151	CO3 :	Understand the role of multiple integral in finding volume of three dimensional objects, finding area between to two curves, finding moment of inertia etc.
	01MA0151	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
	01MA0151	CO5 :	Check the convergence and divergence of various functions which are expandable in infinite terms.
	01MA0151	CO6 :	Gain the fundamental knowledge about special function like Beta and Gamma and its applications.
	01ME0102	CO1 :	Interpret engineering drawings using fundamental technical mathematics.
	01ME0102	CO2 :	Comprehend the theory of projection.
	01ME0102	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
	01ME0102	CO4 :	To improve their technical communication skill in the form of communicative drawings
	01ME0102	CO5 :	Construct basic and intermediate geometry.
	01ME0102	CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.
	01ME0104	CO1 :	Learn about Application of hand tools and power tools.
	01ME0104	CO2 :	Learn about various operations of machine tools.
	01ME0104	CO3 :	Selection of processes and steps for specific operation
	01ME0104	CO4 :	Knowledge and awareness about various safety related operation





	01SL0101	CO1 :	After completion of this course, student will be able to comprehend texts based on science and technology.
	01SL0101	CO2 :	After completion of this course, student will be able to develop the ability to interpret informative and analytical texts.
	01SL0101	CO3 :	After completion of this course, student will be able to evolve an understanding of components of academic writing.
	01SL0101	CO4 :	After completion of this course, student will be able to explain technical concepts in written form.
	01SL0101	CO5 :	After completion of this course, student will be able to compose written texts for the purposes of academic writing.
<b>3</b>	01CI0301	CO1 :	To apply fundamental principles of mechanics and equilibrium to get responses of rigid and deformable bodies
	01CI0301	CO2 :	To identify centroid, Center of Gravity, Center of Mass and moment of inertia of a simple and complex geometrical Shapes.
	01CI0301	CO3 :	To determine different types of stresses and strains developed in the Member subjected to axial, bending, shear, torsion & thermal loads.
	01CI0301	CO4 :	To analyze the determinate beam and draw its shear force and bending moment diagram.
	01CR0301	CO1 :	Understands how to use different tools of language in order to communicate effectively.
	01CR0301	CO2 :	Applies appropriate grammatical structures and wide range of vocabulary in spoken and written discourse in formal context.
	01CR0301	CO3 :	Choose appropriate alternatives in order to cope with personal and professional life.
	01CR0301	CO4 :	Displaying the best of the professional attitude and behavior.
	01MA0201	CO1 :	Expand Various functions in terms of sine and cosine functions
	01MA0201	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations
	01MA0201	CO3 :	Apply Laplace transform & series solution to solve differential equations.
	01MA0201	CO4 :	Apply the knowledge of differential equations and its solutions to evaluate engineering problems
	01ME0301	CO1 :	To identify the fundamentals of Fluid mechanics and define the terminology
	01ME0301	CO2 :	To distinguish between the types of fluid flow
	01ME0301	CO3 :	Apply the basic equation of fluid statics on the plane, curved surfaces, manometers
	01ME0301	CO4 :	Application of continuity and momentum equation, Bernoulli equation
	01ME0301	CO5 :	Apply principles of dimensional analysis and simplitude to simple problems and use of dimensionless parameters
	01ME0301	CO6 :	Ability to analyze analyze fluid flow problems with the application of momentum and energy equation and analyze pipe flow problems
	01ME0302	CO1 :	Identify the functional characteristics of various machine elements
	01ME0302	CO2 :	Construct specified motion profiles for cam and follower.
	01ME0302	CO3 :	Analyze and synthesize planar mechanisms for the motion parameters.
	01ME0302	CO4 :	Evaluate gear tooth geometry and analyze the motion of gear trains.
	01ME0303	CO1 :	Select the machine(tool) according to requirements.
	01ME0303	CO2 :	Able to Compare among the different machine tools.
	01ME0303	CO3 :	Develop the sequence of machining operation to produce the end product.
	01ME0303	CO4 :	Analyze any conventional machining operations.
<b>4</b>	01MA0271	CO1 :	Recognize the error in the number generated by the solution



	01MA0271	CO2 :	Compute solution of algebraic and transcendental equation by numerical methods like Bisection method and Newton Rapshon method
	01MA0271	CO3 :	Apply method of interpolation and extrapolation for prediction
	01MA0271	CO4 :	Use numerical methods and tools in the engineering problem solving process.
	01MA0271	CO5 :	Student able to apply numerical integration in engineering problems
	01MA0271	CO6 :	Student able to apply ordinary differential equation in engineering problems
	01ME0401	CO1 :	Understand terminologies used in machine design.
	01ME0401	CO2 :	Use different theories to design members as beam and column.
	01ME0401	CO3 :	Apply different theories of failures to design components subjected to combined loading.
	01ME0401	CO4 :	Select and design various types of temporary and permanent joints such as riveted joint, welded joint, screw joint and power screw.
	01ME0401	CO5 :	Students will be able to scrutinize different static loading conditions such as simple and combined loading for a given machine element.
	01ME0401	CO6 :	Construct Part and assembly drawings by using design standards and symbols in 2D drafting software.
	01ME0402	CO1 :	Application of manufacturing process for making metallic and nonmetallic components
	01ME0402	CO2 :	Identify and optimize parameters for manufacturing process.
	01ME0402	CO3 :	Design gating system for casting components.
	01ME0402	CO4 :	Application of simulation software for manufacturing processes.
	01ME0402	CO5 :	Develop the sequence of operations to produce the end product.
	01ME0402	CO6 :	Judge the limitations and scope of process to perform variety of functions.
	01ME0403	CO1 :	Enhance the technical knowledge on Engineering materials & its applications.
	01ME0403	CO2 :	Establish important relationships between internal structure, properties and performance of materials during processing and use.
	01ME0403	CO3 :	Design the alloy system based on their knowledge of phase diagrams and metal characteristics.
	01ME0403	CO4 :	Understand different non-destructive testing methods
	01ME0403	CO5 :	Know the various heat treatment processes for steels.
	01ME0403	CO6 :	Apply the knowledge of Heat treatment process for emphasizing relation between micro-structure and mechanical properties.
	01ME0404	CO1 :	To elucidate the basic concepts of thermodynamics
	01ME0404	CO2 :	To simplify properties of Ideal and Real Gases
	01ME0404	CO3 :	To express and utilize first law of thermodynamics for closed and open systems
	01ME0404	CO4 :	To determine the feasibility of thermodynamic cycles and processes using second law of thermodynamics
	01ME0404	CO5 :	To make the use of concept of entropy and exergy to different thermodynamic processes and cycles
	01ME0404	CO6 :	To analyze different gas power, vapor power and refrigeration cycles
<b>5</b>	01AE0501	CO1 :	Implement the basic concepts of Electrical and Electronics engineering.
	01AE0501	CO2 :	Analyze the applications of various Electronics sensors and actuators in various automotive electronics systems.
	01AE0501	CO3 :	Interpret the layout of wiring and connections of electrical systems in automobiles.
	01AE0501	CO4 :	Analyze the construction and applications of Electrical components in various automotive electrical systems.



	01AE0501	CO5 :	Identify and compare the various components and systems of Auto Electrical and Electronics.
	01AE0502	CO1 :	Utilize knowledge of working of Transmission train, Conventional and Non-conventional drives, Clutches, Gear boxes, Synchromesh device, Propeller shaft, Differential axle, Braking, Steering and Suspension systems.
	01AE0502	CO2 :	Identify different systems of an automobile, its components and with its applications.
	01AE0502	CO3 :	Analyze different drives, gearbox and transmission drive train to determine suitability for a vehicle.
	01AE0502	CO4 :	Analyze performance of an automobile based on types of wheels, tyres and axles.
	01AE0502	CO5 :	Distinguish among the systems and transmissions of an automobile.
	01AE0503	CO1 :	Identify different types of internal combustion engines, its components and their applications.
	01AE0503	CO2 :	Select various fuel supply systems, cooling systems, lubricating systems and governing systems used in automobile engines.
	01AE0503	CO3 :	Analyze various stages of combustion in petrol and diesel engines and factors affecting knocking
	01AE0503	CO4 :	Analyze the various methods of power enhancement such as supercharger and turbocharger
	01AE0503	CO5 :	Analyze the performance of automobile engines based on the different test on petrol and diesel engines
	01AE0504	CO1 :	Interpreting the standardization and design considerations for various processes.
	01AE0504	CO2 :	Identification of the appropriate bearing for the given application.
	01AE0504	CO3 :	Examine the dimensions of various I.C.Engine components based on the design equations.
	01AE0504	CO4 :	Estimate the gear parameters for various loading conditions.
	01AE0505	CO1 :	To apply various methods for alternative fuel production and usages in automobile engines
	01AE0505	CO2 :	To analyze change in alternative fuel properties, performance characteristics and emission characteristics
	01AE0505	CO3 :	To analyze Engine Modification required for alternative fuels
	01AE0505	CO4 :	To analyze Electric, Hybrid and fuel cell technologies
<b>6</b>	01AE0601	CO1 :	Students will be able to understand the fundamentals of various automotive body construction details.
	01AE0601	CO2 :	Students will be able to understand various safety provisions of car.
	01AE0601	CO3 :	Students will be able to design the basic aerodynamics in body engineering for better style.
	01AE0601	CO4 :	Students will be able to know about aspect of car body and types of commercial vehicle and design the cabin and frame component to transfer the force and optimize from safety
	01AE0601	CO5 :	Students will be able to know about material used in car body building, tools used, body repair.
	01AE0602	CO0 :	
	01AE0602	CO1 :	Design of drive line components in an automobile system for a given situation
	01AE0602	CO2 :	Design of frictional components in an automobile system for a given situation
	01AE0602	CO3 :	Design a system to direct vehicle in a particular direction and cushioning of an automobile for given situation
	01AE0602	CO4 :	Design a cushioning system of an automobile for given situation
	01AE0602	CO5 :	Optimize the automobile parts as per given situation with different methods
	01AE0603	CO1 :	To Understand the dynamics of vehicle ride under different riding condition.



	01AE0603	CO2 :	To present a problem oriented in depth knowledge of Vehicle Dynamics.
	01AE0603	CO3 :	To address the underlying concepts and methods behind Vehicle Dynamics.
	01AE0603	CO4 :	To Calculate and refer the loads and forces associated to the vehicles.
	01AE0603	CO5 :	To Analyze the behavior of the vehicles under acceleration, ride and braking.
	01AE0605	CO1 :	Apply fundamental of Balancing to various rotating and reciprocating Mechanical system.
	01AE0605	CO2 :	Apply fundamental of vibration to various mechanical system to find frequency and measure vibration
	01AE0605	CO3 :	Analysis the effect of unbalance force on rotating and reciprocating mechanical system.
	01AE0605	CO4 :	Analysis the vibration occurring in various mechanical system and effect of force and damping on vibration system
	01AE0606	CO1 :	Distinguish the modes and phenomenological origin of laws for the different modes of heat and mass transfer
	01AE0606	CO2 :	Compute heat conduction in a steady and transient state for various geometrics
	01AE0606	CO3 :	Predict empirical correlation for analyzing free and forced convection problem
	01AE0606	CO4 :	Appraise the performance of heat exchangers by using various design method
	01AE0606	CO5 :	Derive radiation heat exchange between black surface, diffuse and gray enclosure
	01AE0610	CO1 :	Understand the importance of Design Engineering.
	01AE0610	CO2 :	Identify various Design Engineering approaches.
	01AE0610	CO3 :	Apply various methodologies to design the product and in testing the product.
	01AE0610	CO4 :	Understand various Project Management Processes.
	01AE0610	CO5 :	Demonstrate effective project execution and control techniques that result in successful projects.
<b>7</b>	01AE0731	CO1 :	Perform test to measure the engine power, vehicle emission and noise level from various vehicle components.
	01AE0731	CO2 :	Breakdown of the fuel consumption by the vehicle into different component friction and analyse the result to improve fuel efficiency.
	01AE0731	CO3 :	Analyse the vehicle for different safety test like crash test, roll over test, etc.
	01AE0731	CO4 :	Evaluate turn circle diameter, braking performance, top speed and acceleration, etc. by road test.
	01AE0732	CO1 :	Implement the basic concepts of Electrical engineering.
	01AE0732	CO2 :	Identify, demonstrate and compare the various components and systems of Automotive Electrical systems.
	01AE0732	CO3 :	Test the layout of wiring and connections of electrical systems in automobiles.
	01AE0732	CO4 :	Analyze the construction and applications of Electrical components in various automotive electrical systems.
	01AE0732	CO5 :	Investigate and solve the problems of automotive electrical systems.
<b>8</b>	01AE0831	CO1 :	To select appropriate maintenance and workshop management practices used in garage
	01AE0831	CO2 :	To choose different measuring and safety instruments used in the automobile vehicles
	01AE0831	CO3 :	To examine, identify various faults and carry out maintenance work in automobile engine, Steering system, Brakes, Suspension system and Transmission systems
	01AE0831	CO4 :	To identify wheel misalignment & wheel imbalance, faults in electrical and air conditioning system and carry out maintenance work



**Marwadi**  
University

**Bachelor of Technology**

**Department of Automobile Engineering**

	01AE0832	CO1 :	Analyze active and passive safety system of automobiles
	01AE0832	CO2 :	Analyze the testing of sensors in automobile engineering
	01AE0832	CO3 :	Analyze the testing of actuators in automobile engineering
	01AE0832	CO4 :	Analyze the use of computer and ECM in automobile engineering
	01AE0832	CO5 :	Identify different faults and error codes and solve them



**Marwadi**  
University

**Bachelor of Technology**

**Department of Automobile Engineering**

**Course Outcome**

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**B.Tech. in Automobile Engineering**



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	01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
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	01MA0101	CO2 :	apply and solve first order differential equations to real life problems
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	01MA0101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
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	01ME0101	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.
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	01ME0101	CO5 :	Analyze the various energy conversion cycles and systems.
<b>2</b>	01EE0103	CO1 :	Recognize importance of electrical energy and its day to day applications. (Understand)
	01EE0103	CO2 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions. (Apply)
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	01EE0103	CO4 :	Explain the need of batteries, its characteristics and charging methods. (Remember/Knowledge)
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	01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
	01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
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	01MA0151	CO2 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.
	01MA0151	CO3 :	Understand the role of multiple integral in finding volume of three dimensional objects, finding area between two curves, finding moment of inertia etc.
	01MA0151	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
	01MA0151	CO5 :	Check the convergence and divergence of various functions which are expandable in infinite terms.
	01MA0151	CO6 :	Gain the fundamental knowledge about special function like Beta and Gamma and its applications.
	01ME0102	CO1 :	Interpret engineering drawings using fundamental technical mathematics.
	01ME0102	CO2 :	Comprehend the theory of projection.
	01ME0102	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
	01ME0102	CO4 :	To improve their technical communication skill in the form of communicative drawings
	01ME0102	CO5 :	Construct basic and intermediate geometry.
	01ME0102	CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.
	01ME0104	CO1 :	Learn about Application of hand tools and power tools.
	01ME0104	CO2 :	Learn about various operations of machine tools.
	01ME0104	CO3 :	Selection of processes and steps for specific operation
	01ME0104	CO4 :	Knowledge and awareness about various safety related operation
01SL0102	CO1 :	To enhance reading skills for academic purposes	





	01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes
	01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
	01SL0102	CO4 :	To express their ideas in formal, academic written form
	01SL0103	CO1 :	Develop speaking competence for academic purpose
	01SL0103	CO2 :	Speak on a given topic in the context of technology
	01SL0103	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements
	01SL0103	CO4 :	Enhance the ability to make a presentation on a given topic
<b>3</b>	01CI0301	CO1 :	To apply fundamental principles of mechanics and equilibrium to get responses of rigid and deformable bodies
	01CI0301	CO2 :	To identify centroid, Center of Gravity, Center of Mass and moment of inertia of a simple and complex geometrical Shapes.
	01CI0301	CO3 :	To determine different types of stresses and strains developed in the Member subjected to axial, bending, shear, torsion & thermal loads.
	01CI0301	CO4 :	To analyze the determinate beam and draw its shear force and bending moment diagram.
	01CR0302	CO1 :	Express the basics of human values.
	01CR0302	CO2 :	Articulate human values and grow as responsible human beings in the society
	01CR0302	CO3 :	Develop ethical conduct and deliver their professional duties.
	01CR0302	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level
	01MA0301	CO1 :	Expand Various functions in terms of sine and cosine functions
	01MA0301	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations
	01MA0301	CO3 :	Apply Laplace transform & series solution to solve differential equations.
	01MA0301	CO4 :	Apply the knowledge of differential equations and its solutions to evaluate engineering problems
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	01ME0302	CO2 :	Construct specified motion profiles for cam and follower.
	01ME0302	CO3 :	Analyze and synthesize planar mechanisms for the motion parameters.
	01ME0302	CO4 :	Evaluate gear tooth geometry and analyze the motion of gear trains.
	01ME0304	CO1 :	Understand the importance of Design Thinking.
	01ME0304	CO2 :	Evaluate the quality of your information and your emotions; keep thinking straight.
	01ME0304	CO3 :	Identify skills and personality traits of successful problem solving.
	01ME0304	CO4 :	Apply standard problem-solving heuristics to aid in problem solving.
	01ME0304	CO5 :	Apply problem-solving techniques to programming activities.
	01ME0304	CO6 :	Formulate and successfully communicate the solutions to problems.
	01ME1301	CO1 :	To identify the fundamentals of Fluid mechanics and define the terminology.
	01ME1301	CO2 :	To distinguish between the types of fluid flow.
	01ME1301	CO3 :	Apply the basic equation of fluid statics on the plane, curved surfaces, manometers,
	01ME1301	CO4 :	Application of continuity and momentum equation, Bernoulli equation .
	01ME1301	CO5 :	Apply principles of dimensional analysis and simplitude to simple problems and use of dimensionless parameters.
	01ME1301	CO6 :	Ability to analyze fluid flow problems with the application of momentum and energy equation and analyze pipe flow problems.



	01ME1303	CO1 :	Select the machine(tool) according to requirements.
	01ME1303	CO2 :	Able to Compare among the different machine tools.
	01ME1303	CO3 :	Develop the sequence of machining operation to produce the end product.
	01ME1303	CO4 :	Analyze any conventional machining operations.
<b>4</b>	01MA0271	CO1 :	Recognize the error in the number generated by the solution
	01MA0271	CO2 :	Compute solution of algebraic and transcendental equation by numerical methods like Bisection method and Newton Rapshon method
	01MA0271	CO3 :	Apply method of interpolation and extrapolation for prediction
	01MA0271	CO4 :	Use numerical methods and tools in the engineering problem solving process.
	01MA0271	CO5 :	Student able to apply numerical integration in engineering problems
	01MA0271	CO6 :	Student able to apply ordinary differential equation in engineering problems
	01ME0401	CO1 :	Understand terminologies used in machine design.
	01ME0401	CO2 :	Use different theories to design members as beam and column.
	01ME0401	CO3 :	Apply different theories of failures to design components subjected to combined loading.
	01ME0401	CO4 :	Select and design various types of temporary and permanent joints such as riveted joint, welded joint, screw joint and power screw.
	01ME0401	CO5 :	Students will be able to scrutinize different static loading conditions such as simple and combined loading for a given machine element.
	01ME0401	CO6 :	Construct Part and assembly drawings by using design standards and symbols in 2D drafting software.
	01ME0404	CO1 :	To elucidate the basic concepts of thermodynamics
	01ME0404	CO2 :	To simplify properties of Ideal and Real Gases
	01ME0404	CO3 :	To express and utilize first law of thermodynamics for closed and open systems
	01ME0404	CO4 :	To determine the feasibility of thermodynamic cycles and processes using second law of thermodynamics
	01ME0404	CO5 :	To make the use of concept of entropy and exergy to different thermodynamic processes and cycles
	01ME0404	CO6 :	To analyze different gas power, vapor power and refrigeration cycles
	01ME0405	CO1 :	Understand the Human Centric approach for design.
	01ME0405	CO2 :	Understand significance of the empathy and solution based on empathy
	01ME0405	CO3 :	Importance of design thinking when addressing social change
	01ME0405	CO4 :	Generate the innovative ideas and will convert in new solutions.
	01ME0405	CO5 :	Build a possible prototype solutions
	01ME1402	CO1 :	Application of manufacturing process for making metallic and nonmetallic components.
	01ME1402	CO2 :	Identify and optimize parameters for manufacturing process.
	01ME1402	CO3 :	Design gating system for casting components.
	01ME1402	CO4 :	Application of simulation software for manufacturing processes.
	01ME1403	CO1 :	Enhance the technical knowledge on Engineering materials & its applications.
	01ME1403	CO2 :	Establish important relationships between internal structure, properties and performance of materials during processing and use.
	01ME1403	CO3 :	Design the alloy system based on their knowledge of phase diagrams and metal characteristics.
	01ME1403	CO4 :	Understand different non-destructive testing methods.
	01ME1403	CO5 :	Know the various heat treatment processes for steels.



	01ME1403	CO6 :	Apply the knowledge of Heat treatment process for emphasizing relation between microstructure and mechanical properties.
<b>5</b>	01AE0501	CO1 :	Implement the basic concepts of Electrical and Electronics engineering.
	01AE0501	CO2 :	Analyze the applications of various Electronics sensors and actuators in various automotive electronics systems.
	01AE0501	CO3 :	Interpret the layout of wiring and connections of electrical systems in automobiles.
	01AE0501	CO4 :	Analyze the construction and applications of Electrical components in various automotive electrical systems.
	01AE0501	CO5 :	Identify and compare the various components and systems of Auto Electrical and Electronics.
	01AE0502	CO1 :	Utilize knowledge of working of Transmission train, Conventional and Non-conventional drives, Clutches, Gear boxes, Synchromesh device, Propeller shaft, Differential axle, Braking, Steering and Suspension systems.
	01AE0502	CO2 :	Identify different systems of an automobile, its components and with its applications.
	01AE0502	CO3 :	Analyze different drives, gearbox and transmission drive train to determine suitability for a vehicle.
	01AE0502	CO4 :	Analyze performance of an automobile based on types of wheels, tyres and axles.
	01AE0502	CO5 :	Distinguish among the systems and transmissions of an automobile.
	01AE0503	CO1 :	Identify different types of internal combustion engines, its components and their applications.
	01AE0503	CO2 :	Select various fuel supply systems, cooling systems, lubricating systems and governing systems used in automobile engines.
	01AE0503	CO3 :	Analyze various stages of combustion in petrol and diesel engines and factors affecting knocking
	01AE0503	CO4 :	Analyze the various methods of power enhancement such as supercharger and turbocharger
	01AE0503	CO5 :	Analyze the performance of automobile engines based on the different test on petrol and diesel engines
	01AE0504	CO1 :	Interpreting the standardization and design considerations for various processes.
	01AE0504	CO2 :	Identification of the appropriate bearing for the given application.
	01AE0504	CO3 :	Examine the dimensions of various I.C.Engine components based on the design equations.
	01AE0504	CO4 :	Estimate the gear parameters for various loading conditions.
	01AE0505	CO1 :	To apply various methods for alternative fuel production and usages in automobile engines
01AE0505	CO2 :	To analyze change in alternative fuel properties, performance characteristics and emission characteristics	
01AE0505	CO3 :	To analyze Engine Modification required for alternative fuels	
01AE0505	CO4 :	To analyze Electric, Hybrid and fuel cell technologies	
<b>6</b>	01AE0601	CO1 :	Students will be able to understand the fundamentals of various automotive body construction details.
	01AE0601	CO2 :	Students will be able to understand various safety provisions of car.
	01AE0601	CO3 :	Students will be able to design the basic aerodynamics in body engineering for better style.
	01AE0601	CO4 :	Students will be able to know about aspect of car body and types of commercial vehicle and design the cabin and frame component to transfer the force and optimize from safety
	01AE0601	CO5 :	Students will be able to know about material used in car body building, tools used, body repair.
	01AE0602	CO0 :	



	01AE0602	CO1 :	Design of drive line components in an automobile system for a given situation
	01AE0602	CO2 :	Design of frictional components in an automobile system for a given situation
	01AE0602	CO3 :	Design a system to direct vehicle in a particular direction and cushioning of an automobile for given situation
	01AE0602	CO4 :	Design a cushioning system of an automobile for given situation
	01AE0602	CO5 :	Optimize the automobile parts as per given situation with different methods
	01AE0603	CO1 :	To Understand the dynamics of vehicle ride under different riding condition.
	01AE0603	CO2 :	To present a problem oriented in depth knowledge of Vehicle Dynamics.
	01AE0603	CO3 :	To address the underlying concepts and methods behind Vehicle Dynamics.
	01AE0603	CO4 :	To Calculate and refer the loads and forces associated to the vehicles.
	01AE0603	CO5 :	To Analyze the behavior of the vehicles under acceleration, ride and braking.
	01AE0605	CO1 :	Apply fundamental of Balancing to various rotating and reciprocating Mechanical system.
	01AE0605	CO2 :	Apply fundamental of vibration to various mechanical system to find frequency and measure vibration
	01AE0605	CO3 :	Analysis the effect of unbalance force on rotating and reciprocating mechanical system.
	01AE0605	CO4 :	Analysis the vibration occurring in various mechanical system and effect of force and damping on vibration system
	01AE0606	CO1 :	Distinguish the modes and phenomenological origin of laws for the different modes of heat and mass transfer
	01AE0606	CO2 :	Compute heat conduction in a steady and transient state for various geometrics
	01AE0606	CO3 :	Predict empirical correlation for analyzing free and forced convection problem
	01AE0606	CO4 :	Appraise the performance of heat exchangers by using various design method
	01AE0606	CO5 :	Derive radiation heat exchange between black surface, diffuse and gray enclosure
	01AE0610	CO1 :	Understand the importance of Design Engineering.
	01AE0610	CO2 :	Identify various Design Engineering approaches.
	01AE0610	CO3 :	Apply various methodologies to design the product and in testing the product.
	01AE0610	CO4 :	Understand various Project Management Processes.
	01AE0610	CO5 :	Demonstrate effective project execution and control techniques that result in successful projects.
<b>7</b>	01AE0731	CO1 :	Perform test to measure the engine power, vehicle emission and noise level from various vehicle components.
	01AE0731	CO2 :	Breakdown of the fuel consumption by the vehicle into different component friction and analyse the result to improve fuel efficiency.
	01AE0731	CO3 :	Analyse the vehicle for different safety test like crash test, roll over test, etc.
	01AE0731	CO4 :	Evaluate turn circle diameter, braking performance, top speed and acceleration, etc. by road test.
	01AE0732	CO1 :	Implement the basic concepts of Electrical engineering.
	01AE0732	CO2 :	Identify, demonstrate and compare the various components and systems of Automotive Electrical systems.
	01AE0732	CO3 :	Test the layout of wiring and connections of electrical systems in automobiles.



	01AE0732	CO4 :	Analyze the construction and applications of Electrical components in various automotive electrical systems.
	01AE0732	CO5 :	Investigate and solve the problems of automotive electrical systems.
<b>8</b>	01AE0831	CO1 :	To select appropriate maintenance and workshop management practices used in garage
	01AE0831	CO2 :	To choose different measuring and safety instruments used in the automobile vehicles
	01AE0831	CO3 :	To examine, identify various faults and carry out maintenance work in automobile engine, Steering system, Brakes, Suspension system and Transmission systems
	01AE0831	CO4 :	To identify wheel misalignment & wheel imbalance, faults in electrical and air conditioning system and carry out maintenance work
	01AE0832	CO1 :	Analyze active and passive safety system of automobiles
	01AE0832	CO2 :	Analyze the testing of sensors in automobile engineering
	01AE0832	CO3 :	Analyze the testing of actuators in automobile engineering
	01AE0832	CO4 :	Analyze the use of computer and ECM in automobile engineering
	01AE0832	CO5 :	Identify different faults and error codes and solve them



**Marwadi**  
University

**Bachelor of Technology**

**Department of Automobile Engineering**

**Course Outcome**

**Batch**

**(2018-19)**

**B.Tech. in Automobile Engineering**



Sem	Subject Code	Sr No	Course Out Comes
1	01CI0101	CO1 :	Recognize importance of Civil engineering and its day to day applications.
	01CI0101	CO2 :	Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
	01CI0101	CO3 :	Describe qualitative comparison between different materials and its selection.
	01CI0101	CO4 :	Analyse the water resources, its harvesting and its consumptive use.
	01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
	01CI0101	CO6 :	Acquaint with the various modes of transportation.
	01CR0103	CO1 :	Understand importance of role of Values in developing self
	01CR0103	CO2 :	Inculcate right values, ethics, attitudes, manners and behaviours for life
	01CR0103	CO3 :	Respond and relate with expectations, competitions and power of networking
	01CR0103	CO4 :	Apply the values in order to live a positive, healthy and productive life.
	01CR0103	CO5 :	Understand the significance of having appropriate attitude and balance towards work life as well as personal life.
	01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
	01EN0101	CO2 :	Know the importance of natural resources for the sustainable development of life.
	01EN0101	CO3 :	Understand the effect of growing population on the Environment.
	01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
	01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
	01GS0101	CO1 :	To Interpret the mechanics of various types of sound waves -what they look like, how they are produced, interact with other sound waves and materials.
	01GS0101	CO2 :	To Describe the basic physical principles and applications of ultrasonic sound.
	01GS0101	CO3 :	To Discuss construction, principle of optical fiber communication. Analyze the structure and properties of lasers to their performance and intended applications .
	01GS0101	CO4 :	To Utilize the concept of superconductivity, magnetic and advanced engineering materials and their behaviors under various system conditions.
	01GS0101	CO5 :	To Explain the need of NDT and its methodologies. Illustrate the properties and mechanisms of nano physics.
	01GS0101	CO6 :	To demonstrate in the laboratory the ability to collect, analyze data and to prepare coherent reports of his or her findings
	01MA1101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
	01MA1101	CO2 :	Apply and solve first order differential equations to real life problems
	01MA1101	CO3 :	Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
	01MA1101	CO4 :	Apply Multiple Integral to evaluate the Surface Area and Volume of any 3D objects.
	01MA1101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
	01MA1101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.



	01ME0101	CO1 :	Understand basic terminologies and fundamentals of mechanical system by correlating science concept.
	01ME0101	CO2 :	Apply the governing laws of mechanical engineering to find solution of different systems.
	01ME0101	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.
	01ME0101	CO4 :	Identify functional characteristics of various mechanisms.
	01ME0101	CO5 :	Analyze the various energy conversion cycles and systems.
	01SL0102	CO1 :	To enhance reading skills for academic purposes
	01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes
	01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
	01SL0102	CO4 :	To express their ideas in formal, academic written form
	01SL0103	CO1 :	Develop speaking competence for academic purpose
	01SL0103	CO2 :	Speak on a given topic in the context of technology
	01SL0103	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements
	01SL0103	CO4 :	Enhance the ability to make a presentation on a given topic
<b>2</b>	01CE0101	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
	01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
	01CE0101	CO3 :	Express and Distinguish various loops in C language (Analyze).
	01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures(Apply)
	01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
	01CE0101	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
	01EE0103	CO1 :	Recognize importance of electrical energy and its day to day applications. (Understand)
	01EE0103	CO2 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions. (Apply)
	01EE0103	CO3 :	Analyse and solve DC Circuits, AC Single phase and magnetic circuits. (Analyse)
	01EE0103	CO4 :	Explain the need of batteries, its characteristics and charging methods. (Remember/Knowledge)
	01EE0103	CO5 :	Perceive the detail understanding of construction, operation and applications of various components like Diode, BJT and Op-Amp. (Understand)
	01EE0103	CO6 :	Recognize basic electronic devices used in various circuits. (Understand)
	01MA1151	CO1 :	Explain the linear dependence of vectors of different vector space.
	01MA1151	CO2 :	Apply the concept of Eigen values and vectors in various field of engineering like control theory, vibration analysis, quantum mechanics etc
	01MA1151	CO3 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.
	01MA1151	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
	01MA1151	CO5 :	Determine convergence of improper integrals and explain special functions like Beta, Gama and error functions.
	01MA1151	CO6 :	Apply Gauss elimination to solve linear system of equations
	01ME0102	CO1 :	Interpret engineering drawings using fundamental technical mathematics.





	01ME0102	CO2 :	Comprehend the theory of projection.
	01ME0102	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
	01ME0102	CO4 :	To improve their technical communication skill in the form of communicative drawings
	01ME0102	CO5 :	Construct basic and intermediate geometry.
	01ME0102	CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.
	01ME0104	CO1 :	Learn about Application of hand tools and power tools.
	01ME0104	CO2 :	Learn about various operations of machine tools.
	01ME0104	CO3 :	Selection of processes and steps for specific operation
	01ME0104	CO4 :	Knowledge and awareness about various safety related operation
<b>3</b>	01CR0302	CO1 :	Express the basics of human values.
	01CR0302	CO2 :	Articulate human values and grow as responsible human beings in the society
	01CR0302	CO3 :	Develop ethical conduct and deliver their professional duties.
	01CR0302	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level
	01MA0301	CO1 :	Expand Various functions in terms of sine and cosine functions
	01MA0301	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations
	01MA0301	CO3 :	Apply Laplace transform & series solution to solve differential equations.
	01MA0301	CO4 :	Apply the knowledge of differential equations and its solutions to evaluate engineering problems
	01ME0302	CO1 :	Identify the functional characteristics of various machine elements
	01ME0302	CO2 :	Construct specified motion profiles for cam and follower.
	01ME0302	CO3 :	Analyze and synthesize planar mechanisms for the motion parameters.
	01ME0302	CO4 :	Evaluate gear tooth geometry and analyze the motion of gear trains.
	01ME0304	CO1 :	Understand the importance of Design Thinking.
	01ME0304	CO2 :	Evaluate the quality of your information and your emotions; keep thinking straight.
	01ME0304	CO3 :	Identify skills and personality traits of successful problem solving.
	01ME0304	CO4 :	Apply standard problem-solving heuristics to aid in problem solving.
	01ME0304	CO5 :	Apply problem-solving techniques to programming activities.
	01ME0304	CO6 :	Formulate and successfully communicate the solutions to problems.
	01ME0305	CO1 :	To understand the laws of mechanics and their application to an engineering problem.
	01ME0305	CO2 :	Apply resultant force to move or equilibrant force to keep the body in equilibrium.
	01ME0305	CO3 :	To Apply the fundamentals of stress/strain analysis with confidence to the simple structure.
	01ME0305	CO4 :	Apply shear force and bending moment diagrams to analyze the resistance offered by the beam and find the stresses induced in a beam.
	01ME0305	CO5 :	To Analyze the Deflection of Beams, Torsion of Circular Shafts.
	01ME1301	CO1 :	To identify the fundamentals of Fluid mechanics and define the terminology.
	01ME1301	CO2 :	To distinguish between the types of fluid flow.
	01ME1301	CO3 :	Apply the basic equation of fluid statics on the plane, curved surfaces, manometers,
	01ME1301	CO4 :	Application of continuity and momentum equation, Bernoulli equation .



	01ME1301	CO5 :	Apply principles of dimensional analysis and simplitude to simple problems and use of dimensionless parameters.
	01ME1301	CO6 :	Ability to analyze fluid flow problems with the application of momentum and energy equation and analyze pipe flow problems.
	01ME1303	CO1 :	Select the machine(tool) according to requirements.
	01ME1303	CO2 :	Able to Compare among the different machine tools.
	01ME1303	CO3 :	Develop the sequence of machining operation to produce the end product.
	01ME1303	CO4 :	Analyze any conventional machining operations.
<b>4</b>	01MA0271	CO1 :	Recognize the error in the number generated by the solution
	01MA0271	CO2 :	Compute solution of algebraic and transcendental equation by numerical methods like Bisection method and Newton Rapshon method
	01MA0271	CO3 :	Apply method of interpolation and extrapolation for prediction
	01MA0271	CO4 :	Use numerical methods and tools in the engineering problem solving process.
	01MA0271	CO5 :	Student able to apply numerical integration in engineering problems
	01MA0271	CO6 :	Student able to apply ordinary differential equation in engineering problems
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	01ME0404	CO2 :	To simplify properties of Ideal and Real Gases
	01ME0404	CO3 :	To express and utilize first law of thermodynamics for closed and open systems
	01ME0404	CO4 :	To determine the feasibility of thermodynamic cycles and processes using second law of thermodynamics
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	01ME0405	CO5 :	Build a possible prototype solutions
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	01ME1401	CO2 :	Use different theories to design a member as a column or strut.
	01ME1401	CO3 :	Apply different theories of failures to design components subjected to combined loading.
	01ME1401	CO4 :	Select and design various types of temporary and permanent joints such as riveted joint, welded joint, screw joint and power screw.
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	01ME1402	CO3 :	Design gating system for casting components.
	01ME1402	CO4 :	Application of simulation software for manufacturing processes.
	01ME1403	CO1 :	Enhance the technical knowledge on Engineering materials & its applications.
	01ME1403	CO2 :	Establish important relationships between internal structure, properties and performance of materials during processing and use.



	01ME1403	CO3 :	Design the alloy system based on their knowledge of phase diagrams and metal characteristics.
	01ME1403	CO4 :	Understand different non-destructive testing methods.
	01ME1403	CO5 :	Know the various heat treatment processes for steels.
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	01AE0501	CO2 :	Analyze the applications of various Electronics sensors and actuators in various automotive electronics systems.
	01AE0501	CO3 :	Interpret the layout of wiring and connections of electrical systems in automobiles.
	01AE0501	CO4 :	Analyze the construction and applications of Electrical components in various automotive electrical systems.
	01AE0501	CO5 :	Identify and compare the various components and systems of Auto Electrical and Electronics.
	01AE0502	CO1 :	Utilize knowledge of working of Transmission train, Conventional and Non-conventional drives, Clutches, Gear boxes, Synchromesh device, Propeller shaft, Differential axle, Braking, Steering and Suspension systems.
	01AE0502	CO2 :	Identify different systems of an automobile, its components and with its applications.
	01AE0502	CO3 :	Analyze different drives, gearbox and transmission drive train to determine suitability for a vehicle.
	01AE0502	CO4 :	Analyze performance of an automobile based on types of wheels, tyres and axles.
	01AE0502	CO5 :	Distinguish among the systems and transmissions of an automobile.
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	01AE0503	CO2 :	Select various fuel supply systems, cooling systems, lubricating systems and governing systems used in automobile engines.
	01AE0503	CO3 :	Analyze various stages of combustion in petrol and diesel engines and factors affecting knocking
	01AE0503	CO4 :	Analyze the various methods of power enhancement such as supercharger and turbocharger
	01AE0503	CO5 :	Analyze the performance of automobile engines based on the different test on petrol and diesel engines
	01AE0504	CO1 :	Interpreting the standardization and design considerations for various processes.
	01AE0504	CO2 :	Identification of the appropriate bearing for the given application.
	01AE0504	CO3 :	Examine the dimensions of various I.C.Engine components based on the design equations.
	01AE0504	CO4 :	Estimate the gear parameters for various loading conditions.
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01AE0505	CO3 :	To analyze Engine Modification required for alternative fuels	
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<b>6</b>	01AE0601	CO1 :	Students will be able to understand the fundamentals of various automotive body construction details.
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	01AE0601	CO3 :	Students will be able to design the basic aerodynamics in body engineering for better style.
	01AE0601	CO4 :	Students will be able to know about aspect of car body and types of commercial vehicle and design the cabin and frame component to transfer the force and optimize from safety



	01AE0601	CO5 :	Students will be able to know about material used in car body building, tools used, body repair.
	01AE0602	CO0 :	
	01AE0602	CO1 :	Design of drive line components in an automobile system for a given situation
	01AE0602	CO2 :	Design of frictional components in an automobile system for a given situation
	01AE0602	CO3 :	Design a system to direct vehicle in a particular direction and cushioning of an automobile for given situation
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	01AE0603	CO2 :	To present a problem oriented in depth knowledge of Vehicle Dynamics.
	01AE0603	CO3 :	To address the underlying concepts and methods behind Vehicle Dynamics.
	01AE0603	CO4 :	To Calculate and refer the loads and forces associated to the vehicles.
	01AE0603	CO5 :	To Analyze the behavior of the vehicles under acceleration, ride and braking.
	01AE0604	CO1 :	Gathering basic concepts and knowledge of Refrigeration and Air-Conditioning system
	01AE0604	CO2 :	Analyze performance parameters of Air-refrigeration system, Vapour Compression & Vapour Absorption Refrigeration by using various refrigerants.
	01AE0604	CO3 :	Examine different terminology of psychrometry and psychrometric processes for human comfort with load calculation sheet
	01AE0604	CO4 :	Predict the duct design method and air distribution system for analyzing duct and piping system
	01AE0604	CO5 :	Categorize refrigeration and air-conditioning system components based on application
	01AE0605	CO1 :	Apply fundamental of Balancing to various rotating and reciprocating Mechanical system.
	01AE0605	CO2 :	Apply fundamental of vibration to various mechanical system to find frequency and measure vibration
	01AE0605	CO3 :	Analysis the effect of unbalance force on rotating and reciprocating mechanical system.
	01AE0605	CO4 :	Analysis the vibration occurring in various mechanical system and effect of force and damping on vibration system
	01AE0610	CO1 :	Understand the importance of Design Engineering.
	01AE0610	CO2 :	Identify various Design Engineering approaches.
	01AE0610	CO3 :	Apply various methodologies to design the product and in testing the product.
	01AE0610	CO4 :	Understand various Project Management Processes.
	01AE0610	CO5 :	Demonstrate effective project execution and control techniques that result in successful projects.
<b>7</b>	01AE0721	CO1 :	Describe basic of vehicle performance.
	01AE0721	CO2 :	Explain Testing methods implemented for measurement of different vehicle performance parameter.
	01AE0721	CO3 :	Discuss about the safety testing of the vehicle.
	01AE0721	CO4 :	Analyze automobile vehicle electrical circuit.
	01AE0722	CO1 :	Students will describe basic concepts of combustion process in diesel engine.
	01AE0731	CO1 :	Perform test to measure the engine power, vehicle emission and noise level from various vehicle components.



	01AE0731	CO2 :	Breakdown of the fuel consumption by the vehicle into different component friction and analyse the result to improve fuel efficiency.
	01AE0731	CO3 :	Analyse the vehicle for different safety test like crash test, roll over test, etc.
	01AE0731	CO4 :	Evaluate turn circle diameter, braking performance, top speed and acceleration, etc. by road test.
	01AE0732	CO1 :	Implement the basic concepts of Electrical engineering.
	01AE0732	CO2 :	Identify, demonstrate and compare the various components and systems of Automotive Electrical systems.
	01AE0732	CO3 :	Test the layout of wiring and connections of electrical systems in automobiles.
	01AE0732	CO4 :	Analyze the construction and applications of Electrical components in various automotive electrical systems.
	01AE0732	CO5 :	Investigate and solve the problems of automotive electrical systems.
<b>8</b>	01AE0821	CO1 :	Students will be able to classify special type of vehicles based on the need and purpose.
	01AE0821	CO2 :	Students will be able describe the working principles of different system of SPV.
	01AE0821	CO3 :	Students will be able to explain design considerations and features of special purpose vehicles.
	01AE0822	CO1 :	Understanding the working of electrical vehicles.
	01AE0822	CO2 :	Understanding of Architecture of electrical vehicles.
	01AE0822	CO3 :	Understanding of electrical vehicle batteries and battery management system.
	01AE0822	CO4 :	Working of charging station and EV scenario.
	01AE0831	CO1 :	To select appropriate maintenance and workshop management practices used in garage
	01AE0831	CO2 :	To choose different measuring and safety instruments used in the automobile vehicles
	01AE0831	CO3 :	To examine, identify various faults and carry out maintenance work in automobile engine, Steering system, Brakes, Suspension system and Transmission systems
	01AE0831	CO4 :	To identify wheel misalignment & wheel imbalance, faults in electrical and air conditioning system and carry out maintenance work
	01AE0832	CO1 :	Analyze active and passive safety system of automobiles
	01AE0832	CO2 :	Analyze the testing of sensors in automobile engineering
	01AE0832	CO3 :	Analyze the testing of actuators in automobile engineering
	01AE0832	CO4 :	Analyze the use of computer and ECM in automobile engineering
	01AE0832	CO5 :	Identify different faults and error codes and solve them



**Marwadi**  
University

**Bachelor of Technology**

**Department of Automobile Engineering**

**Course Outcome**

**Batch**

**(2019-20)**

**B.Tech. in Automobile Engineering**



Sem	Subject Code	Sr No	Course Out Comes
<b>1</b>	01CI0101	CO1 :	Recognize importance of Civil engineering and its day to day applications.
	01CI0101	CO2 :	Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
	01CI0101	CO3 :	Describe qualitative comparison between different materials and its selection.
	01CI0101	CO4 :	Analyse the water resources, its harvesting and its consumptive use.
	01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
	01CI0101	CO6 :	Acquaint with the various modes of transportation.
	01CR0103	CO1 :	Understand importance of role of Values in developing self
	01CR0103	CO2 :	Inculcate right values, ethics, attitudes, manners and behaviours for life
	01CR0103	CO3 :	Respond and relate with expectations, competitions and power of networking
	01CR0103	CO4 :	Apply the values in order to live a positive, healthy and productive life.
	01CR0103	CO5 :	Understand the significance of having appropriate attitude and balance towards work life as well as personal life.
	01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
	01EN0101	CO2 :	Know the importance of natural resources for the sustainable development of life.
	01EN0101	CO3 :	Understand the effect of growing population on the Environment.
	01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
	01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
	01MA1101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
	01MA1101	CO2 :	Apply and solve first order differential equations to real life problems
	01MA1101	CO3 :	Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
	01MA1101	CO4 :	Apply Multiple Integral to evaluate the Surface Area and Volume of any 3D objects.
	01MA1101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
	01MA1101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
	01ME0101	CO1 :	Understand basic terminologies and fundamentals of mechanical system by correlating science concept.
	01ME0101	CO2 :	Apply the governing laws of mechanical engineering to find solution of different systems.
	01ME0101	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.
	01ME0101	CO4 :	Identify functional characteristics of various mechanisms.
	01ME0101	CO5 :	Analyze the various energy conversion cycles and systems.
	01ME0104	CO1 :	Learn about Application of hand tools and power tools.
	01ME0104	CO2 :	Learn about various operations of machine tools.
	01ME0104	CO3 :	Selection of processes and steps for specific operation
	01ME0104	CO4 :	Knowledge and awareness about various safety related operation



	01SL0102	CO1 :	To enhance reading skills for academic purposes
	01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes
	01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
	01SL0102	CO4 :	To express their ideas in formal, academic written form
	01SL0103	CO1 :	Develop speaking competence for academic purpose
	01SL0103	CO2 :	Speak on a given topic in the context of technology
	01SL0103	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements
	01SL0103	CO4 :	Enhance the ability to make a presentation on a given topic
<b>3</b>	01CR0302	CO1 :	Express the basics of human values.
	01CR0302	CO2 :	Articulate human values and grow as responsible human beings in the society
	01CR0302	CO3 :	Develop ethical conduct and deliver their professional duties.
	01CR0302	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level
	01MA0301	CO1 :	Expand Various functions in terms of sine and cosine functions
	01MA0301	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations
	01MA0301	CO3 :	Apply Laplace transform & series solution to solve differential equations.
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	01ME0302	CO2 :	Construct specified motion profiles for cam and follower.
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	01ME0305	CO2 :	Apply resultant force to move or equilibrant force to keep the body in equilibrium.
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	01ME0305	CO4 :	Apply shear force and bending moment diagrams to analyze the resistance offered by the beam and find the stresses induced in a beam.
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	01ME1301	CO1 :	To identify the fundamentals of Fluid mechanics and define the terminology.
	01ME1301	CO2 :	To distinguish between the types of fluid flow.
	01ME1301	CO3 :	Apply the basic equation of fluid statics on the plane, curved surfaces, manometers,
	01ME1301	CO4 :	Application of continuity and momentum equation, Bernoulli equation





	01ME1301	CO5 :	Apply principles of dimensional analysis and simplitude to simple problems and use of dimensionless parameters.
	01ME1301	CO6 :	Ability to analyze fluid flow problems with the application of momentum and energy equation and analyze pipe flow problems.
	01ME1303	CO1 :	Select the machine(tool) according to requirements.
	01ME1303	CO2 :	Able to Compare among the different machine tools.
	01ME1303	CO3 :	Develop the sequence of machining operation to produce the end product.
	01ME1303	CO4 :	Analyze any conventional machining operations.
<b>4</b>	01MA0271	CO1 :	Recognize the error in the number generated by the solution
	01MA0271	CO2 :	Compute solution of algebraic and transcendental equation by numerical methods like Bisection method and Newton Rapshon method
	01MA0271	CO3 :	Apply method of interpolation and extrapolation for prediction
	01MA0271	CO4 :	Use numerical methods and tools in the engineering problem solving process.
	01MA0271	CO5 :	Student able to apply numerical integration in engineering problems
	01MA0271	CO6 :	Student able to apply ordinary differential equation in engineering problems
	01ME0404	CO1 :	To elucidate the basic concepts of thermodynamics
	01ME0404	CO2 :	To simplify properties of Ideal and Real Gases
	01ME0404	CO3 :	To express and utilize first law of thermodynamics for closed and open systems
	01ME0404	CO4 :	To determine the feasibility of thermodynamic cycles and processes using second law of thermodynamics
	01ME0404	CO5 :	To make the use of concept of entropy and exergy to different thermodynamic processes and cycles
	01ME0404	CO6 :	To analyze different gas power, vapor power and refrigeration cycles
	01ME0405	CO1 :	Understand the Human Centric approach for design.
	01ME0405	CO2 :	Understand significance of the empathy and solution based on empathy
	01ME0405	CO3 :	Importance of design thinking when addressing social change
	01ME0405	CO4 :	Generate the innovative ideas and will convert in new solutions.
	01ME0405	CO5 :	Build a possible prototype solutions
	01ME1401	CO1 :	Understand terminologies used in machine design.
	01ME1401	CO2 :	Use different theories to design a member as a column or strut.
	01ME1401	CO3 :	Apply different theories of failures to design components subjected to combined loading.
	01ME1401	CO4 :	Select and design various types of temporary and permanent joints such as riveted joint, welded joint, screw joint and power screw.
	01ME1401	CO5 :	Students will be able to scrutinize different static loading conditions such as simple and combined loading for a given machine element.
	01ME1401	CO6 :	Construct Part and assembly drawings by using design standards and symbols in 2D drafting software.
	01ME1402	CO1 :	Application of manufacturing process for making metallic and nonmetallic components.
	01ME1402	CO2 :	Identify and optimize parameters for manufacturing process.
	01ME1402	CO3 :	Design gating system for casting components.
	01ME1402	CO4 :	Application of simulation software for manufacturing processes.
	01ME1403	CO1 :	Enhance the technical knowledge on Engineering materials & its applications.
	01ME1403	CO2 :	Establish important relationships between internal structure, properties and performance of materials during processing and use.



	01ME1403	CO3 :	Design the alloy system based on their knowledge of phase diagrams and metal characteristics.
	01ME1403	CO4 :	Understand different non-destructive testing methods.
	01ME1403	CO5 :	Know the various heat treatment processes for steels.
	01ME1403	CO6 :	Apply the knowledge of Heat treatment process for emphasizing relation between microstructure and mechanical properties.
<b>5</b>	01AE0501	CO1 :	Implement the basic concepts of Electrical and Electronics engineering.
	01AE0501	CO2 :	Analyze the applications of various Electronics sensors and actuators in various automotive electronics systems.
	01AE0501	CO3 :	Interpret the layout of wiring and connections of electrical systems in automobiles.
	01AE0501	CO4 :	Analyze the construction and applications of Electrical components in various automotive electrical systems.
	01AE0501	CO5 :	Identify and compare the various components and systems of Auto Electrical and Electronics.
	01AE0502	CO1 :	Utilize knowledge of working of Transmission train, Conventional and Non-conventional drives, Clutches, Gear boxes, Synchromesh device, Propeller shaft, Differential axle, Braking, Steering and Suspension systems.
	01AE0502	CO2 :	Identify different systems of an automobile, its components and with its applications.
	01AE0502	CO3 :	Analyze different drives, gearbox and transmission drive train to determine suitability for a vehicle.
	01AE0502	CO4 :	Analyze performance of an automobile based on types of wheels, tyres and axles.
	01AE0502	CO5 :	Distinguish among the systems and transmissions of an automobile.
	01AE0503	CO1 :	Identify different types of internal combustion engines, its components and their applications.
	01AE0503	CO2 :	Select various fuel supply systems, cooling systems, lubricating systems and governing systems used in automobile engines.
	01AE0503	CO3 :	Analyze various stages of combustion in petrol and diesel engines and factors affecting knocking
	01AE0503	CO4 :	Analyze the various methods of power enhancement such as supercharger and turbocharger
	01AE0503	CO5 :	Analyze the performance of automobile engines based on the different test on petrol and diesel engines
	01AE0504	CO1 :	Interpreting the standardization and design considerations for various processes.
	01AE0504	CO2 :	Identification of the appropriate bearing for the given application.
	01AE0504	CO3 :	Examine the dimensions of various I.C.Engine components based on the design equations.
	01AE0504	CO4 :	Estimate the gear parameters for various loading conditions.
	01AE0505	CO1 :	To apply various methods for alternative fuel production and usages in automobile engines
01AE0505	CO2 :	To analyze change in alternative fuel properties, performance characteristics and emission characteristics	
01AE0505	CO3 :	To analyze Engine Modification required for alternative fuels	
01AE0505	CO4 :	To analyze Electric, Hybrid and fuel cell technologies	
<b>6</b>	01AE0601	CO1 :	Students will be able to understand the fundamentals of various automotive body construction details.
	01AE0601	CO2 :	Students will be able to understand various safety provisions of car.
	01AE0601	CO3 :	Students will be able to design the basic aerodynamics in body engineering for better style.
	01AE0601	CO4 :	Students will be able to know about aspect of car body and types of commercial vehicle and design the cabin and frame component to transfer the force and optimize from safety



01AE0601	CO5 :	Students will be able to know about material used in car body building, tools used, body repair.
01AE0602	CO0 :	
01AE0602	CO1 :	Design of drive line components in an automobile system for a given situation
01AE0602	CO2 :	Design of frictional components in an automobile system for a given situation
01AE0602	CO3 :	Design a system to direct vehicle in a particular direction and cushioning of an automobile for given situation
01AE0602	CO4 :	Design a cushioning system of an automobile for given situation
01AE0602	CO5 :	Optimize the automobile parts as per given situation with different methods
01AE0603	CO1 :	To Understand the dynamics of vehicle ride under different riding condition.
01AE0603	CO2 :	To present a problem oriented in depth knowledge of Vehicle Dynamics.
01AE0603	CO3 :	To address the underlying concepts and methods behind Vehicle Dynamics.
01AE0603	CO4 :	To Calculate and refer the loads and forces associated to the vehicles.
01AE0603	CO5 :	To Analyze the behavior of the vehicles under acceleration, ride and braking.
01AE0604	CO1 :	Gathering basic concepts and knowledge of Refrigeration and Air-Conditioning system
01AE0604	CO2 :	Analyze performance parameters of Air-refrigeration system, Vapour Compression & Vapour Absorption Refrigeration by using various refrigerants.
01AE0604	CO3 :	Examine different terminology of psychrometry and psychrometric processes for human comfort with load calculation sheet
01AE0604	CO4 :	Predict the duct design method and air distribution system for analyzing duct and piping system
01AE0604	CO5 :	Categorize refrigeration and air-conditioning system components based on application
01AE0605	CO1 :	Apply fundamental of Balancing to various rotating and reciprocating Mechanical system.
01AE0605	CO2 :	Apply fundamental of vibration to various mechanical system to find frequency and measure vibration
01AE0605	CO3 :	Analysis the effect of unbalance force on rotating and reciprocating mechanical system.
01AE0605	CO4 :	Analysis the vibration occurring in various mechanical system and effect of force and damping on vibration system
01AE0606	CO1 :	Distinguish the modes and phenomenological origin of laws for the different modes of heat and mass transfer
01AE0606	CO2 :	Compute heat conduction in a steady and transient state for various geometrics
01AE0606	CO3 :	Predict empirical correlation for analyzing free and forced convection problem
01AE0606	CO4 :	Appraise the performance of heat exchangers by using various design method
01AE0606	CO5 :	Derive radiation heat exchange between black surface, diffuse and gray enclosure
01AE0610	CO1 :	Understand the importance of Design Engineering.
01AE0610	CO2 :	Identify various Design Engineering approaches.
01AE0610	CO3 :	Apply various methodologies to design the product and in testing the product.
01AE0610	CO4 :	Understand various Project Management Processes.
01AE0610	CO5 :	Demonstrate effective project execution and control techniques that result in successful projects.



<b>7</b>	01AE0721	CO1 :	Describe basic of vehicle performance.
	01AE0721	CO2 :	Explain Testing methods implemented for measurement of different vehicle performance parameter.
	01AE0721	CO3 :	Discuss about the safety testing of the vehicle.
	01AE0721	CO4 :	Analyze automobile vehicle electrical circuit.
	01AE0722	CO1 :	Students will describe basic concepts of combustion process in diesel engine.
	01AE0731	CO1 :	Perform test to measure the engine power, vehicle emission and noise level from various vehicle components.
	01AE0731	CO2 :	Breakdown of the fuel consumption by the vehicle into different component friction and analyse the result to improve fuel efficiency.
	01AE0731	CO3 :	Analyse the vehicle for different safety test like crash test, roll over test, etc.
	01AE0731	CO4 :	Evaluate turn circle diameter, braking performance, top speed and acceleration, etc. by road test.
	01AE0732	CO1 :	Implement the basic concepts of Electrical engineering.
	01AE0732	CO2 :	Identify, demonstrate and compare the various components and systems of Automotive Electrical systems.
	01AE0732	CO3 :	Test the layout of wiring and connections of electrical systems in automobiles.
	01AE0732	CO4 :	Analyze the construction and applications of Electrical components in various automotive electrical systems.
	01AE0732	CO5 :	Investigate and solve the problems of automotive electrical systems.



**Marwadi**  
University

**Bachelor of Technology**

**Department of Automobile Engineering**

**Course Outcome**

**Batch**

**(2020-21)**

**B.Tech. in Automobile Engineering**



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	01EN0101	CO3 :	Understand the effect of growing population on the Environment.
	01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
	01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
	01MA1101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
	01MA1101	CO2 :	Apply and solve first order differential equations to real life problems
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	01SL0102	CO1 :	To enhance reading skills for academic purposes
	01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes
	01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
	01SL0102	CO4 :	To express their ideas in formal, academic written form
	01SL0103	CO1 :	Develop speaking competence for academic purpose
	01SL0103	CO2 :	Speak on a given topic in the context of technology
	01SL0103	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements
	01SL0103	CO4 :	Enhance the ability to make a presentation on a given topic
<b>2</b>	01CE0101	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
	01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
	01CE0101	CO3 :	Express and Distinguish various loops in C language (Analyze).
	01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures(Apply)
	01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
	01CE0101	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
	01EE0103	CO1 :	Recognize importance of electrical energy and its day to day applications. (Understand)
	01EE0103	CO2 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions. (Apply)
	01EE0103	CO3 :	Analyse and solve DC Circuits, AC Single phase and magnetic circuits. (Analyse)
	01EE0103	CO4 :	Explain the need of batteries, its characteristics and charging methods. (Remember/Knowledge)
	01EE0103	CO5 :	Perceive the detail understanding of construction, operation and applications of various components like Diode, BJT and Op-Amp. (Understand)
	01EE0103	CO6 :	Recognize basic electronic devices used in various circuits. (Understand)
	01GS0101	CO1 :	To Interpret the mechanics of various types of sound waves -what they look like, how they are produced, interact with other sound waves and materials.
	01GS0101	CO2 :	To Describe the basic physical principles and applications of ultrasonic sound.
	01GS0101	CO3 :	To Discuss construction, principle of optical fiber communication. Analyze the structure and properties of lasers to their performance and intended applications .
	01GS0101	CO4 :	To Utilize the concept of superconductivity, magnetic and advanced engineering materials and their behaviors under various system conditions.
	01GS0101	CO5 :	To Explain the need of NDT and its methodologies. Illustrate the properties and mechanisms of nano physics.
	01GS0101	CO6 :	To demonstrate in the laboratory the ability to collect, analyze data and to prepare coherent reports of his or her findings
	01MA1151	CO1 :	Explain the linear dependence of vectors of different vector space.
	01MA1151	CO2 :	Apply the concept of Eigen values and vectors in various field of engineering like control theory, vibration analysis, quantum mechanics etc
	01MA1151	CO3 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.



	01MA1151	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
	01MA1151	CO5 :	Determine convergence of improper integrals and explain special functions like Beta, Gama and error functions.
	01MA1151	CO6 :	Apply Gauss elimination to solve linear system of equations
	01ME0102	CO1 :	Interpret engineering drawings using fundamental technical mathematics.
	01ME0102	CO2 :	Comprehend the theory of projection.
	01ME0102	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
	01ME0102	CO4 :	To improve their technical communication skill in the form of communicative drawings
	01ME0102	CO5 :	Construct basic and intermediate geometry.
	01ME0102	CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.
<b>3</b>	01CR0302	CO1 :	Express the basics of human values.
	01CR0302	CO2 :	Articulate human values and grow as responsible human beings in the society
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	01ME1301	CO2 :	To distinguish between the types of fluid flow.





	01ME1301	CO3 :	Apply the basic equation of fluid statics on the plane, curved surfaces, manometers,
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	01ME0404	CO3 :	To express and utilize first law of thermodynamics for closed and open systems
	01ME0404	CO4 :	To determine the feasibility of thermodynamic cycles and processes using second law of thermodynamics
	01ME0404	CO5 :	To make the use of concept of entropy and exergy to different thermodynamic processes and cycles
	01ME0404	CO6 :	To analyze different gas power, vapor power and refrigeration cycles
	01ME0406	CO1 :	Importance of creativity, problem solving and innovation while addressing science, engineering and social issues.
	01ME0406	CO2 :	Demonstrate the ability to contextualize knowledge related to professional engineering practices.
	01ME0406	CO3 :	Demonstrate the functioning effectively as an individual and team member.
	01ME0406	CO4 :	Ability to engage in life-long learning in the context of technological change.
	01ME1401	CO1 :	Understand terminologies used in machine design.
	01ME1401	CO2 :	Use different theories to design a member as a column or strut.
	01ME1401	CO3 :	Apply different theories of failures to design components subjected to combined loading.
	01ME1401	CO4 :	Select and design various types of temporary and permanent joints such as riveted joint, welded joint, screw joint and power screw.
	01ME1401	CO5 :	Students will be able to scrutinize different static loading conditions such as simple and combined loading for a given machine element.
	01ME1401	CO6 :	Construct Part and assembly drawings by using design standards and symbols in 2D drafting software.
	01ME1402	CO1 :	Application of manufacturing process for making metallic and nonmetallic components.
	01ME1402	CO2 :	Identify and optimize parameters for manufacturing process.
	01ME1402	CO3 :	Design gating system for casting components.



	01ME1402	CO4 :	Application of simulation software for manufacturing processes.
	01ME1403	CO1 :	Enhance the technical knowledge on Engineering materials & its applications.
	01ME1403	CO2 :	Establish important relationships between internal structure, properties and performance of materials during processing and use.
	01ME1403	CO3 :	Design the alloy system based on their knowledge of phase diagrams and metal characteristics.
	01ME1403	CO4 :	Understand different non-destructive testing methods.
	01ME1403	CO5 :	Know the various heat treatment processes for steels.
	01ME1403	CO6 :	Apply the knowledge of Heat treatment process for emphasizing relation between microstructure and mechanical properties.
<b>5</b>	01AE0501	CO1 :	Implement the basic concepts of Electrical and Electronics engineering.
	01AE0501	CO2 :	Analyze the applications of various Electronics sensors and actuators in various automotive electronics systems.
	01AE0501	CO3 :	Interpret the layout of wiring and connections of electrical systems in automobiles.
	01AE0501	CO4 :	Analyze the construction and applications of Electrical components in various automotive electrical systems.
	01AE0501	CO5 :	Identify and compare the various components and systems of Auto Electrical and Electronics.
	01AE0502	CO1 :	Utilize knowledge of working of Transmission train, Conventional and Non-conventional drives, Clutches, Gear boxes, Synchromesh device, Propeller shaft, Differential axle, Braking, Steering and Suspension systems.
	01AE0502	CO2 :	Identify different systems of an automobile, its components and with its applications.
	01AE0502	CO3 :	Analyze different drives, gearbox and transmission drive train to determine suitability for a vehicle.
	01AE0502	CO4 :	Analyze performance of an automobile based on types of wheels, tyres and axles.
	01AE0502	CO5 :	Distinguish among the systems and transmissions of an automobile.
	01AE0503	CO1 :	Identify different types of internal combustion engines, its components and their applications.
	01AE0503	CO2 :	Select various fuel supply systems, cooling systems, lubricating systems and governing systems used in automobile engines.
	01AE0503	CO3 :	Analyze various stages of combustion in petrol and diesel engines and factors affecting knocking
	01AE0503	CO4 :	Analyze the various methods of power enhancement such as supercharger and turbocharger
	01AE0503	CO5 :	Analyze the performance of automobile engines based on the different test on petrol and diesel engines
	01AE0504	CO1 :	Interpreting the standardization and design considerations for various processes.
	01AE0504	CO2 :	Identification of the appropriate bearing for the given application.
	01AE0504	CO3 :	Examine the dimensions of various I.C.Engine components based on the design equations.
	01AE0504	CO4 :	Estimate the gear parameters for various loading conditions.
	01AE0505	CO1 :	To apply various methods for alternative fuel production and usages in automobile engines
	01AE0505	CO2 :	To analyze change in alternative fuel properties, performance characteristics and emission characteristics
	01AE0505	CO3 :	To analyze Engine Modification required for alternative fuels
	01AE0505	CO4 :	To analyze Electric, Hybrid and fuel cell technologies



**Marwadi**  
University

**Bachelor of Technology**

**Department of Automobile Engineering**

**Course Outcome**

**Batch**

**(2021-22)**

**B.Tech. in Automobile Engineering**



Sem	Subject Code	Sr No	Course Out Comes
1	01CI1101	CO1 :	Recognize importance of civil engineering and its day to day applications
	01CI1101	CO2 :	Interpret the plan/map; locate the objects on ground from map and from site to on paper plan/map.
	01CI1101	CO3 :	Describe qualitative comparison between different materials and its selection.
	01CI1101	CO4 :	Create & interpret building planning and will be able to draw plan, section and elevation.
	01CI1101	CO5 :	Acquaint with the various modes of transportation.
	01CR1103	CO1 :	Understand importance of role of Values in developing self
	01CR1103	CO2 :	Inculcate right values, ethics, attitudes, manners and behaviours for life
	01CR1103	CO3 :	Respond and relate with expectations, competitions and power of networking
	01CR1103	CO4 :	Apply the values in order to live a positive, healthy and productive life.
	01CR1103	CO5 :	Understand the significance of having appropriate attitude and balance towards work life as well as personal life.
	01EN1101	CO1 :	Understand and realize the multidisciplinary nature of Environment and its components.
	01EN1101	CO2 :	Know the importance of natural resources for the sustainable development of life.
	01EN1101	CO3 :	Understand the effect of growing population on the Environment.
	01EN1101	CO4 :	Classify the different types of pollution and measure to control pollution
	01EN1101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
	01GS2101	CO1 :	Obtain knowledge about various Non-Destructive-Testing methods and use it in various engineering fields.
	01GS2101	CO2 :	Acquire knowledge about various crystal structures and important properties of different materials.
	01GS2101	CO3 :	Understand basic properties of superconducting materials and check its industrial applications.
	01GS2101	CO4 :	Prepare Nano materials and use it for various engineering applications
	01MA2101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
	01MA2101	CO2 :	Apply and solve first order differential equations to real life problems
	01MA2101	CO3 :	Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
	01MA2101	CO4 :	Apply Multiple Integral to evaluate the Surface Area and Volume of any 3D objects.
	01MA2101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
	01MA2101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
	01ME1101	CO1 :	To understand the basic terminology of Mechanical systems.
	01ME1101	CO2 :	To able to make elementary calculations of ideal gases and steam.
	01ME1101	CO3 :	To understand working and construction of different boilers and mountings and accessories.
	01ME1101	CO4 :	To analyze the performance of I.C. engines.
	01ME1101	CO5 :	To understand working and construction of pump and various refrigeration cycles.
	01ME1101	CO6 :	To understand various power transmission elements.
	01SL0102	CO1 :	To enhance reading skills for academic purposes
01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes	



	01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
	01SL0102	CO4 :	To express their ideas in formal, academic written form
	01SL0103	CO1 :	Develop speaking competence for academic purpose
	01SL0103	CO2 :	Speak on a given topic in the context of technology
	01SL0103	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements
	01SL0103	CO4 :	Enhance the ability to make a presentation on a given topic
<b>2</b>	01CE1101	CO1 :	Able to explain programming problems logically through flow charts and algorithms.
	01CE1101	CO2 :	Identify programming principles using C Language.
	01CE1101	CO3 :	Demonstrate problem solving skills through C Language.
	01CE1101	CO4 :	Generate computer-based solution for real time problem using programming language.
	01CE1101	CO5 :	Develop confidence to self-educate new programming languages.
	01EE1101	CO1 :	Analyze electrical circuits with different elements
	01EE1101	CO2 :	Apply principle of electromagnetic for electromechanical energy conversion in machines
	01EE1101	CO3 :	Choose a semiconductor circuit based on a given application.
	01EE1101	CO4 :	Describe the operation of various OpAmp circuits.
	01EE1101	CO5 :	Define the role of electrical apparatus used in household applications
	01MA0103	CO1 :	Apply vectors in higher dimensional space in experimental data, graphical images, civil and mechanical systems.
	01MA0103	CO2 :	apply System of linear equations in solving the problems of electrical and mechanical engineering, applied mechanics etc.
	01MA0103	CO3 :	Apply the concept of Eigen values and vectors in various field of engineering like control theory, vibration analysis, quantum mechanics etc.
	01MA0103	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
	01ME1102	CO1 :	Know, understand and able to define the methods of engineering drawing
	01ME1102	CO2 :	Learn basic sketching methods
	01ME1102	CO3 :	Understand engineering drawings using fundamental mathematics
	01ME1102	CO4 :	Construct Engineered Drawing
	01ME1102	CO5 :	Develop visualization skills so that they can create new product design
	01ME1102	CO6 :	Understand the theory of projection, Learn technical communication skill
<b>3</b>	01CR0302	CO1 :	Express the basics of human values.
	01CR0302	CO2 :	Articulate human values and grow as responsible human beings in the society
	01CR0302	CO3 :	Develop ethical conduct and deliver their professional duties.
	01CR0302	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level
	01MA1301	CO1 :	Apply Laplace transform and Fourier series to solve differential equations.
	01MA1301	CO2 :	Classify and apply the standard methods to solve ordinary differential equations.
	01MA1301	CO3 :	Expand various functions in terms of sine and cosine functions.
	01MA1301	CO4 :	Apply partial differential equations in engineering problems.

**Course Outcomes (COs) for R20 Regulations (Batch: 2018-2022)**

Course Outcomes for First Year First Semester Course		
Course	#	Statement
01CE0102 Computer Workshop	CO1 :	Understand the basic concept and structure of computer hardware and networking.
	CO2 :	Identify the existing configuration of the computers and peripherals.
	CO3 :	Upgrading the system as and when required.
	CO4 :	Apply their knowledge about computer peripherals to identify / rectify problems onboard.
	CO5 :	Integrate the PCs into local area network and re-install operating system and various application programs.
	CO6 :	Manage data backup and restore operations on computer and update application software.
01CR0103 Value Edition	CO1 :	Understand importance of role of Values in developing self
	CO2 :	Inculcate right values, ethics, attitudes, manners and behaviours for life
	CO3 :	Respond and relate with expectations, competitions and power of networking
	CO4 :	Apply the values in order to live a positive, healthy and productive life.
	CO5 :	Understand the significance of having appropriate attitude and balance towards work life as well as personal life.
01EC0101 Basics of Electronics Engineering	CO1 :	Understand the Voltage current and operation of semiconductor devices, circuits and operational Amplifier.
	CO2 :	Apply basic fundamentals of semiconductor devices and operational amplifier to illustrate/show the operation of application.
	CO3 :	Apply the basic knowledge of simulation tool & Circuit level concepts to synthesize real life problems.
	CO4 :	Analyze the behavior of Electronics circuits containing Semiconductor device, Operational Amplifier or Verify using Modern tools.
	CO5 :	Design, implement and analyze of electronic circuits to solve the problem with in society.
01EE0101 Elements of Electrical Engineering	CO1 :	Recognize importance of electrical energy and its day to day applications.
	CO2 :	Interpret the role of resistor, capacitor and inductor and their behavior under various system conditions
	CO3 :	Qualitatively compare AC and DC system as well as single phase and three phase systems in AC.
	CO4 :	Analyze and solve DC Circuits, AC Single phase and Three Phase Circuits
	CO5 :	Explain the need of batteries, its characteristics and charging methods.
	CO6 :	Choose the most appropriate protective devices based on the appliance used and safety requirements.

01MA1101 Differential and Integral Calculus	CO1 :	Expand functions using Maclaurin's and Taylor's series.
	CO2 :	apply and solve first order differential equations to real life problems
	CO3 :	Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
	CO4 :	Apply partial differentiation to evaluate equations of tangent plane and normal line for given surface.
	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
01ME0101 Elements of Mechanical Engineering	CO1 :	Understand basic terminologies and fundamentals of mechanical system by correlating science concept.
	CO2 :	Apply the governing laws of mechanical engineering to find solution of different systems.
	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.
	CO4 :	Identify functional characteristics of various mechanisms.
	CO5 :	Analyze the various energy conversion cycles and systems.
01SL0102 Reading and Writing for Technology	CO1 :	To enhance reading skills for academic purposes
	CO2 :	To evolve appropriate writing competence for academic purposes
	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
	CO4 :	To express their ideas in formal, academic written form
01SL0103 Speaking and Presentation skills	CO1 :	Develop speaking competence for academic purpose
	CO2 :	Speak on a given topic in the context of technology
	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements
	CO4 :	Enhance the ability to make a presentation on a given topic
<b>Course Outcomes for First Year Second Semester Course</b>		
<b>Course</b>		
<b>Title with Code</b>	<b>#</b>	<b>Statements</b>
01CE0101 Computer Programming	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
	CO3 :	Express and Distinguish various loops in C language (Analyze).
	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures(Apply)
	CO5 :	Select the appropriate user defined function category.(Evaluate)

	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
01EC0102 Digital Electronics	CO1 :	Develop understanding of basic digital circuits like logic gates, logic families, flip flops and memory devices
	CO2 :	Use knowledge of various number systems and binary codes to solve conversion problems.
	CO3 :	Apply concepts of Boolean algebra and other minimization techniques for digital circuit design.
	CO4 :	Design digital circuits using different combinational and sequential logic.
	CO5 :	Implement various combinational and sequential circuits using appropriate hardware/simulation.
01EN0101 Basics of Environmental Studies	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
	CO2 :	Know the importance of natural resources for the sustainable development of life.
	CO3 :	Understand the effect of growing population on the Environment.
	CO4 :	Classify the different types of pollution and measure to control pollution
	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
01GS0101 Physics	CO1 :	To Interpret the mechanics of various types of sound waves -what they look like, how they are produced, interact with other sound waves and materials.
	CO2 :	To Describe the basic physical principles and applications of ultrasonic sound.
	CO3 :	To Discuss construction, principle of optical fiber communication. Analyze the structure and properties of lasers to their performance and intended applications .
	CO4 :	To Utilize the concept of superconductivity, magnetic and advanced engineering materials and their behaviors under various system conditions.
	CO5 :	To Explain the need of NDT and its methodologies. Illustrate the properties and mechanisms of nano physics.
	CO6 :	To demonstrate in the laboratory the ability to collect, analyze data and to prepare coherent reports of his or her findings
01MA1151 Matrix Algebra and Vector Calculus	CO1 :	Explain the linear dependence of vectors of different vector space.
	CO2 :	"Apply the concept of Eigen values and vectors in various field of engineering like control theory, vibration analysis, quantum mechanicsetc"
	CO3 :	"Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc."
	CO4 :	"Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
	CO5 :	Determine convergence of improper integrals and explain special functions like Beta, Gama and error functions.
	CO6 :	Apply Gauss elimination to solve linear system of equations
01ME0103	CO1 :	Interpret engineering drawings using fundamental technical mathematics.



Engineering Drawings	CO2 :	Comprehend the theory of projection.
	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
	CO4 :	To improve their technical communication skill in the form of communicative drawings
	CO5 :	Construct basic and intermediate geometry.
	CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.
<b>Course Outcomes for Second Year Third Semester Course</b>		
<b>Course</b>		
<b>Title with Code</b>	<b>#</b>	<b>Statements</b>
01CE0301 Data Structure	CO1 :	differentiate Linear and Non-Linear data structures (Understand)
	CO2 :	implement Linear and Non-Linear data structures such as Array, Stack, Queue, Linked List, Tree (Apply)
	CO3 :	perform different Graph traversal methods Depth First Search, Breadth First Search (Apply)
	CO4 :	implement sorting and searching techniques such as Bubble sort, Selection sort, Insertion sort, Quick sort, Merge sort, Sequential search, Binary search (Apply)
	CO5 :	Apply Hash functions and Collision Resolution by Open Addressing and Chaining (Apply)
	CO6 :	choose efficient data structure for a given problem (Evaluate)
01CE1302 Database Management System	CO1 :	Use Relational Database and different models of Database. (Apply)
	CO2 :	Design ER Model for an Application. (Create)
	CO3 :	Apply Concepts of normalization with functional dependency to construct Data dictionary. (Apply)
	CO4 :	Implement Structured Query Language (SQL) and evaluate query expression. (Evaluate)
	CO5 :	Differentiate and Execute transactional Concepts and locking mechanism (Analyze)
	CO6 :	Use concepts of Database Security on Database. (Apply)
01CE1303 Object Oriented Design and Programming	CO1 :	Identify the potential benefits of object-oriented programming features and compare them with structure-oriented programming features. (understand)
	CO2 :	Apply various object-oriented Features and Concepts to designing programs and to solve various computing problems using C++ language. (apply)
	CO3 :	Analyze programs based on exception handling and using advanced features like STL for faster development (analysis)
	CO4 :	Apply Different concepts of object-oriented programming to develop real-world applications. (Apply)
01CE0304 Design Thinking and Problem Solving Skills	CO1 :	Understand the importance of Design Thinking.(Understand)
	CO2 :	Evaluate the quality of your information and your emotions; keep thinking straight. (Evaluate)
	CO3 :	Identify skills and personality traits of successful problem solving. (Apply)
	CO4 :	Apply standard problem-solving heuristics to aid in problem solving. (Apply)

	CO5 :	Apply problem-solving techniques to programming activities. (Apply)
	CO6 :	Formulate and successfully communicate the solutions to problems. (Create)
01CR0302 Professional Ethics	CO1 :	Express the basics of human values.
	CO2 :	Articulate human values and grow as responsible human beings in the society
	CO3 :	Develop ethical conduct and deliver their professional duties.
	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level
01IT0301 Data Communication and Networking	CO1 :	Understand importance of data communication systems and fundamentals. (Understand)
	CO2 :	Distinguish and relate various physical Medias, interfacing standards and adapters. (Analyze)
	CO3 :	Evaluate various flow control techniques. (Evaluate)
	CO4 :	Apply various modulation technique in analog and digital career system(Apply)
	CO5 :	Understand Physical layer of LAN, MAN and WAN. (Understand)
	CO6 :	Analyse short range and long range wireless technologies. (Analyze)
01MA0231 Discrete Mathematics and Graph Theory	CO1 :	Understand graphs, Logic and Lattices.
	CO2 :	Apply abstract concept of Predicate in design of computing machines, data structures for programming languages.
	CO3 :	Apply concept of Boolean algebra in switching theory and building basic electronic circuits.
	CO4 :	Apply concepts of Kruskal's algorithm to find the shortest possible distance between two objects.
	CO5 :	Apply concepts of graph theory in data mining and networking.
<b>Course Outcomes for Second Year Fourth Semester Course</b>		
<b>Course</b>		
<b>Title with Code</b>	<b>#</b>	<b>Statements</b>
01CE0401 Operating System	CO1 :	Understanding the role of operating system with its function and services. (Understanding)
	CO2 :	Compare Various Algorithm used for CPU Scheduling, Memory management and Disk Scheduling Algorithm. (Evaluate)
	CO3 :	Apply Various Concepts related with Deadlock to solve Problems. (Apply)
	CO4 :	Analyze Protection and Security Mechanism in Operating System. (Analyze)
01CE0402 Computer Organization and Architecture	CO1 :	"Understand and describe the basics of various architectural units of the Computer System"
	CO2 :	"To be able to apply the knowledge of combinational and sequential logical circuits to mimic a simple computer architecture."
	CO3 :	To be able to apply logic to create assembly language programs for different microoperations.
	CO4 :	To be able to Demonstrate ALU operations and instruction level parallelism.
	CO5 :	To be able to Identify and differentiate various methods for I/O mechanisms.
	CO6 :	To be able to identify and differentiate various types of memory and memory mapping techniques.
01CE0403	CO1 :	Understand object oriented programming concepts in java

Object Oriented Programming with Java	CO2 :	"Comprehend building blocks of OOPs language, inheritance, package and interfaces."
	CO3 :	Identify exception handling methods and collection framework.
	CO4 :	Implement file handling and multithreading in object oriented programs.
	CO5 :	Develop GUI based application using applet, awt and swing.
01CE0405 Human Centric Design Approach	CO1 :	Understand the Human Centric approach for design.
	CO2 :	Understand significance of the empathy and solution based on empathy
	CO3 :	Importance of design thinking when addressing social change
	CO4 :	Generate the innovative ideas and will convert in new solutions
01IT0401 Computer Network	CO1 :	(Remember) Describe the importance of computer networks and various performance metrics.
	CO2 :	(Understand) Distinguish and relate various protocols in layered architecture of computer networks.
	CO3 :	(Apply) Explain various topological and routing strategies for IP based networks.
	CO4 :	(Apply) Prepare client server application using socket programming
	CO5 :	(Analysis) Compare various devices and protocols that builds computer network.
	CO6 :	(Evaluate) Measure of network parameters.
01MA1281 Statistical and Numerical Methods	CO1 :	Understand the basic concepts of probability and distribution to realize the logic of data sciences
	CO2 :	Apply the concept of Data representation and Analysis in various field of engineering like image processing etc.
	CO3 :	Apply concept of Correlation and Regression in result analysis and Business forecasting using EXCEL.
	CO4 :	Analyse errors for accuracy and precision of solutions to hike up the level of accuracy in daily calculations.
	CO5 :	Apply curve fitting and interpolation techniques to approximate a function into any known curve to analyse their behaviours.
	CO6 :	Apply Numerical integration to obtain approximate solutions to mathematical problems
<b>Course Outcomes for Third Year Fifth Semester Course</b>		
<b>Course</b>		
<b>Title with Code</b>	<b>#</b>	<b>Statements</b>
01CE0501 Microprocessor Fundamentals & Programming	CO1 :	Understand the architecture and pin diagram of 8085 and advance Microprocessor. (Understand)
	CO2 :	Implement Memory and I/O interfacing in 8085 Microprocessor. (Apply)
	CO3 :	Sketch Timing diagram after getting brief with the addressing mode, byte and machine cycle of instructions.(Apply)
	CO4 :	Apply the concepts of instruction to write, Debug & Simulate assembly language program of 8085 microprocessors. (Apply)
	CO5 :	Analyze time delay generation, counter and waveform generation (Analyze).
01CE0502	CO1 :	Describe the components of J2EE Architecture, MVC Framework and Multi-tier Application and Various Network Protocol (Understand)

Advanced Java Programming	CO2 :	To make use of Servlet and JSP API in the process of enterprise application deployment. (Apply)
	CO3 :	Implement components such as Session, Filters, JSTL, Beans. (Apply)
	CO4 :	Distinguish Application Server, Web Container, JDBC and ORM tools.(Analyse)
	CO5 :	Design and Development of web application having collaboration of Servlets, JSPs, JSF, Spring and Hibernate base upon the requirement. (Create)
01CE0503 Design and Analysis of Algorithms	CO1 :	Learn and understand asymptotic notations for performance of different algorithms. (Understand)
	CO2 :	Derive and solve recurrences describing the performance of divide-and-conquer algorithms (Evaluate)
	CO3 :	Design optimal solution by applying various methods like Dynamic Programming and Greedy Method. (Application)
	CO4 :	Summarize the certain graph algorithms and their analysis.(Application)
	CO5 :	Apply pattern matching algorithms (Application)
	CO6 :	Differentiate polynomial and non-polynomial problems. ( Analysis)
01CE0504 Theory of Automata and Formal Languages	CO1 :	Gain the knowledge of basic kinds of finite automata and their capabilities.(Knowledge)
	CO2 :	To understanding of regular and context-free languages(Comprehension)
	CO3 :	To understand the time and space complexity for p and np problems.(Comprehension)
	CO4 :	To apply proved results using proof by induction, proof by contradiction, proof by construction, proof by case exhaustion.(Application)
	CO5 :	Gain the knowledge of describe and change language to regular expressions and grammars.(Application)
	CO6 :	Constructing the Turing machine for Recursive languages.(Analysis)
01CE0506 Distributed Operating System	CO1 :	Gain knowledge of distributed operating system architecture
	CO2 :	Illustrate principles and importance of distributed operating system.
	CO3 :	Implement distributed client server applications using remote method invocation.
	CO4 :	Distinguish between centralized systems and distributed systems.
	CO5 :	Create state-ful and state-less applications.
01CE0507 Image Processing	CO1 :	To understand the formation of digital image and its various formats.[Understand]
	CO2 :	Implement various filtering techniques in spatial domain and frequency domain.[Apply]
	CO3 :	Implement the colour and gray level image enhancement techniques[Apply]
	CO4 :	Create Matlab program to apply morphological operators and Image Segmentation.[Apply]
01CE0508 Reverse Engineering	CO1 :	Understand the problem in the existing process.
	CO2 :	Collect the large number of data/ information for the product
	CO3 :	Depth analyze of the products and extraction of real time data
	CO4 :	Understand the principles behind the design of the product, ways to redesign and improve the performance of the system.
01IT0502	CO1 :	Analyzing, Construct/create, and evaluate information presented in technical and/or scientific journals.

Seminar	CO2 :	Examine best methods and implement them for developing and presenting a quality scientific presentation on recent trends using various presentation software like PowerPoint, Prezi ( <a href="http://prezi.com">http://prezi.com</a> ), etc.
	CO3 :	Create 5-10 minute video presentation to be delivered via YouTube based upon the analysis and learning of one journal article or recent technology for a second seminar presentation.
	CO4 :	Practice critical evaluation of peer students' work.
01IT0503 Advanced Computer Network	CO1 :	Describe concepts of scaling networks and wireless LAN (Analyze)
	CO2 :	Implement OSPF operations, configuration and troubleshoot (Apply)
	CO3 :	Implement EIGRP operations, configuration and troubleshoot (Apply)
	CO4 :	Implement PPP operations, configuration and troubleshoot (Apply)
	CO5 :	Design ACL for IPv4 and IPv6 with advance configuration (Create)
<b>Course Outcomes for Third Year Sixth Semester Course</b>		
<b>Course</b>		
<b>Title with Code</b>	<b>#</b>	<b>Statements</b>
01CE0601 Compiler Design	CO1 :	To be able to describe compiler and different phases. Using this translate program from source code to executable code and files. (Knowledge)
	CO2 :	Able to explain lexical analysis phase and their connection to language definition through regular expressions and grammars. (Comprehensive)
	CO3 :	Able to explain the syntax analysis phase and differentiate among various parsing techniques and grammar transformation techniques. (Comprehensive)
	CO4 :	Able to apply formal attributed grammars for specifying the syntax and semantics of programming languages. (Application)
	CO5 :	To be able to calculate the effectiveness of optimization and differences between machine dependent and independent translation. (Application)
	CO6 :	Able to use the powerful compiler generation tools such as Lex and YACC. (Analysis)
01CE0602 .Net Technologies	CO1 :	To develop applications with Dot-Net framework
	CO2 :	To create Console based C# application
	CO3 :	To create GUI based desktop application using C# Win-form application
	CO4 :	To create basic database application using ADO.net technology
	CO5 :	To Design and develop basic applications using WPF
01CE0604 Cyber Security	CO1 :	Understanding the basic technical, social and law suits aspect of Cyber Security (Remember)
	CO2 :	Integrate the ethical hacking process and scripting (Create)
	CO3 :	The students can use basic security tools to enhance cyber security. (Analyse)
	CO4 :	Understand the security management methods and auditing. (Evaluation)
	CO5 :	Apply the security principles to system design. (Apply)
01CE0606 Design Engineering and Project Management	CO1 :	Understand the importance of Design Engineering.
	CO2 :	Identify various Design Engineering approaches.
	CO3 :	Apply various methodologies to design the product and in testing the product.
	CO4 :	Understand various Project Management Processes.
	CO5 :	Demonstrate effective project execution and control techniques that result in successful projects.
01CR0601	CO1 :	"Contrast and understand short pieces of business correspondence reports or

Business Benchmark		proposals.(Understanding)"
	CO2 :	"Read and Categorize the extracts from business publications. Ask for the information required.(Analyzing)"
	CO3 :	"Listen to, understand and contribute to discussions in meetings. (Remembering)"
	CO4 :	"Prepare the presentation on a familiar topic. (Applying)"
01IT0601 Software Engineering	CO1 :	Understand various software engineering principles and their application (Understand)
	CO2 :	Demonstrate use of various Agile methodologies for software development (Apply)
	CO3 :	Apply various modelling techniques for designing system requirement (Apply)
	CO4 :	Identify different types of risk and evaluate its impact on software system(Evaluate)
	CO5 :	Distinguish different testing strategies and Create test cases. (Create)
	CO6 :	Able to understand and apply the basic project management practices in real life projects (Apply)
01IT0602 Web Technology	CO1 :	To understand and compare the fundamentals of Web hosting and domain name services. (Analyze)
	CO2 :	To understand various non-browser specific web design principles. (Understand)
	CO3 :	To understand the need and be able to develop HTML and CSS pages with valid structure as well as content. (Evaluate)
	CO4 :	To understand and be able to develop JavaScript/jQuery code to access the DOM structure of web document and object properties. (Apply)
	CO5 :	To develop dynamic web pages with usage of server-side scripting PHP and MySQL. (Evaluate)
<b>Course Outcomes for Fourth Year Seventh Semester Course</b>		
<b>Course</b>		
<b>Title with Code</b>	<b>#</b>	<b>Statements</b>
01CE0701 Mobile Computing	CO1 :	To understand the concepts of Mobile Communication.
	CO2 :	To analyze next-generation Mobile Communication System.
	CO3 :	To understand the network and transport layers of Mobile Communication.
	CO4 :	Analyze various protocols of all layers for mobile and ad hoc wireless communication networks.
	CO5 :	To understand IP and TCP layers of Mobile Communication.
01CE0702 Artificial Intelligence	CO1 :	Assess critically the techniques presented and to apply them to real world problems(Analyze)
	CO2 :	Mindful of the significant difficulties confronting AI and the multifaceted nature of run of the mill issues inside the field(remember)
	CO3 :	Comprehend the significant zones and difficulties of AI(Understanding)
	CO4 :	Apply fundamental AI calculations to take care of issues(Apply)
	CO5 :	Get a learning of utilizations in various zones of registering including the web and human communication(Evaluate)
01CE0704 Android Programming	CO1 :	Demonstrate the Understanding of fundamental of Android Programming (Understand)
	CO2 :	Build their ability to develop software with reasonable complexity on mobile platform (Apply)

	CO3 :	Discover the life cycles of Activities, Applications ,intents and fragments(Evaluate)
	CO4 :	Design the Android apps by using Java Concepts.(Apply)
01CE0705 programming with python	CO1 :	Apply various fundamentals for problem solving using python.
	CO2 :	Implement modular programming and differentiate mutability of various datatypes.
	CO3 :	Create object-oriented solution by applying various concept like polymorphism, inheritance and package with python programming
	CO4 :	Implement exception handling and data structure concepts.
01CE0707 Data Mining and Information Retrieval	CO1 :	Understand different indexing techniques on real data set. (Understand)
	CO2 :	Demonstrate different classification methods on real and synthetic data set. (Apply)
	CO3 :	Discover knowledge using various Data Mining methods for given system/application. (Apply)
	CO4 :	Analyze various data warehousing techniques used in industry. (Analyze)
01IT0701 Advanced Web Technology	CO1 :	Apply Object Oriented concepts in developing PHP applications (Apply)
	CO2 :	Use various third party APIs and advance concepts of PHP to develop Applications (Apply)
	CO3 :	Create and deploy scalable web based system using Laravel (Create)
	CO4 :	Develop server side web applications using Node.js (Create)
01IT0703 Major project 1	CO1 :	To analyze real world problems and design solutions for those problems (Analyze)
	CO2 :	To identify practical aspect of studied technologies (Evaluate)
	CO3 :	To use latest software / hardware as per requirement (Apply)
	CO4 :	To develop complete solutions for read world problems (Create)
	CO5 :	To use different testing methodologies for implemented work (Apply)
	CO6 :	To present and document implemented work effectively (Create)
<b>Course Outcomes for Fourth Year Eighth Semester Course</b>		
<b>Course</b>		
<b>Title with Code</b>	<b>#</b>	<b>Statements</b>
01CE0803 Cloud Computing	CO1 :	Understand and analyze the architecture of Cloud (Analyze).
	CO2 :	Identify and apply deployment and management options of AWS Cloud Architecture (Apply).
	CO3 :	Design architectures to decouple infrastructure and reduce interdependencies (Create).
	CO4 :	Formulate policy based scenarios in Cloud simulators (Create).
	CO5 :	"Define Cloud Computing and memorize the different Cloudservice and deployment models (Remembering)"
	CO6 :	Use and Examine different cloud computing services and its Basics(Understanding)
01CE0804 Machine Learning	CO1 :	Understand machine-learning concepts.(Understand)
	CO2 :	Understand Optimization theory and concepts.(Understand)
	CO3 :	Understand and analyse different method of Gardient Descent. (Analyze)
	CO4 :	Apply concept of Supervised and Unsupervised learning.(Apply)
	CO5 :	Apply the concepts of machine leaning and optimization in designing intelligent systems.(Apply)

01CE0806 Internet of Things	CO1 :	Understand general concepts of Internet of Things (IoT)
	CO2 :	Recognize various devices, sensors and applications
	CO3 :	Apply design concept to IoT solutions
	CO4 :	Analyze various M2M and IoT architectures
	CO5 :	Evaluate design issues in IoT applications
	CO6 :	Create IoT solutions using sensors, actuators and Devices
01IT0801 Major Project 2	CO1 :	Understand, analyze and solve Medium / Large scale industrial / social problems (Analyse)
	CO2 :	Demonstrate the application of various engineering subjects to solve industrial / social problems (Apply)
	CO3 :	Communicate in the way industry demands in oral and documented way. (Create)
	CO4 :	Demonstrate teamwork and leadership qualities. (Apply)
	CO5 :	Demonstrate professional and ethical conduct as per industrial expectations. (Evaluate)





**Marwadi**  
University

**Department of Chemical Engineering**

**Course Outcome**

**Batch**

**(2020-21)**

**M.Tech. in Chemical Engineering**



Sem	Subject Code	Sr No	Course Out Comes
1	01CM0105	CO1 :	Explain the concept of advanced control schemes used in process control.
	01CM0105	CO2 :	Understand the working of distributed control system
	01CM0105	CO3 :	Apply the use of artificial intelligence techniques in process control.
	01CM0105	CO4 :	Apply Dynamics and control of fluid flow, heat and Mass transfer systems.
	01CM0106	CO1 :	Know the role of vector theory in representation and solution of engineering problems.
	01CM0106	CO2 :	Apply the concept of Matrix Algebra in various filed of Engineering like Control Theory, Vibration analysis etc.
	01CM0106	CO3 :	Apply the standard methods to solve higher ordered differential equations.
	01CM0106	CO4 :	Apply the suitable methods to solve various linear and non-linear differential equations.
	01CM0106	CO5 :	Analyze various maximization and minimization problems using Operation research.
	01CM0107	CO1 :	Describe the different technologies and heat distribution configurations.
	01CM0107	CO2 :	Calculate energy conversion performance characteristics.
	01CM0107	CO3 :	Utilize renewable energy as an alternative for conventional energy processes
	01CM0107	CO4 :	Design the power generating devices using renewable energy resources as per the industrial requirement
	01CM0108	CO1 :	Know the need of industrial effluent treatment.
	01CM0108	CO2 :	Analyze the principle and working mechanism of various effluent treatment processes.
	01CM0108	CO3 :	Choose the appropriate treatment method for different industries
	01CM0108	CO4 :	Propose the innovative technologies for the areas requiring further improvements.
	01CM1103	CO1 :	Understand the phenomenon of mass transfer in various operations using advanced techniques
	01CM1103	CO2 :	Analyze the mass transfer operation
	01CM1103	CO3 :	Select suitable mass transfer operation for a particular separation process
	01CM1103	CO4 :	Determine the use and implication of the distillation process with the suitable number of stages and desired type
	01CM1103	CO5 :	Determine number of stages and height of packed column in distillation and extraction operation
	01RM0101	CO1 :	Conduct a quality literature review and find research gap.
	01RM0101	CO2 :	Identify an original and relevant problem and identify methods to find its solution
	01RM0101	CO3 :	Validate the model.
	01RM0101	CO4 :	Present and defend the solution obtained in an effective manner in written or spoken form



	01RM0101	CO5 :	Follow research ethics	
	01RM0101	CO6 :	Understand IPR protection for further research and better products.	
2	01CM0205	CO1 :	Understand the suspended solid catalysed reactions.	
	01CM0205	CO2 :	Familiarize the non-ideal flow patterns in chemical reaction engineering problems.	
	01CM0205	CO3 :	Design catalytic reactor with regenerator.	
	01CM0205	CO4 :	Design reactors that operate at steady state and involve heat effects.	
	01CM0207	CO1 :	Identify the use of design concepts and relevant application of equipment design in process industry	
	01CM0207	CO2 :	Build a bridge between theoretical and practical concepts used for designing the equipment in any process industry.	
	01CM0207	CO3 :	Modify the design of the existing equipment to the new process conditions as per new required capacity.	
	01CM0207	CO4 :	Create understanding of equipment design with mechanical concepts.	
			CO5 :	
	01CM0208	CO1 :		Basic understanding of the fundamental principles of chemical engineering thermodynamics and its laws.
	01CM0208	CO2 :		Learn basic concepts of liquid solution properties
	01CM0208	CO3 :		Examine and select data, and solve energy transformations problems.
	01CM0208	CO4 :		Calculations of various phase and reaction equilibrium.
	01CM0208	CO5 :		Estimation of thermodynamic properties fugacity and activity coefficient
	01CM0209	CO1 :		Identify the appropriate modelling approach for the desired system.
	01CM0209	CO2 :		Correlate the process variables in order to achieve the optimized conditions.
	01CM0209	CO3 :		Justify the developed mathematical model for related system
	01CM0209	CO4 :		Develop mathematical model to simulate it in allied environment.
	01CM0211	CO1 :		Utilize the technological methods in problem solving in process plant.
	01CM0211	CO2 :		Analyse the process flow diagrams.
	01CM0211	CO3 :		Demonstrate the knowledge on the importance of various unit processes and unit operations involved in industrial processes.
	01CM0211	CO4 :		Build a bridge between theoretical and practical concept used in industry.
	01CM0213	CO1 :		Know the need of separation technology.
01CM0213	CO2 :		Apply modern separation techniques in different industries.	
01CM0213	CO3 :		Analyse the conventional separation methods and to enhance them as per required standards.	
01CM0213	CO4 :		Design & develop the desired separation hybrid system in chemical industry.	
3	01CM0306	CO1 :	Identify the problem of Chemical Engineering field.	
	01CM0306	CO2 :	Apply fundamental concept of Chemical engineering to solve the problem.	
	01CM0306	CO3 :	Analyze the result and observation made during project work.	



	01CM0306	CO4 :	Deliver their results or major findings.
	01CM1305	CO1 :	Capability to critically and systematically integrate knowledge to identify issues that must be addressed within framework of specific thesis.
	01CM1305	CO2 :	Identify the gap of research and planning of research design path.
	01CM1305	CO3 :	Conduct research activity independently.
	01CM1305	CO4 :	Analyse and critically evaluate different analytical techniques.
	01CM1305	CO5 :	Create report and research article writing skills
<b>4</b>	01CM0401	CO1 :	Can select problem of Chemical Engineering field.
	01CM0401	CO2 :	Apply fundamental concept of Chemical engineering to solve the problem.
	01CM0401	CO3 :	Analyze the result and observation made during project work.
	01CM0401	CO4 :	Deliver their results or major findings.



**Marwadi**  
University

**Bachelor of Technology**

**Department of Chemical Engineering**

**Course Outcome**

**Batch**

**(2017-18)**

**B.Tech. in Chemical Engineering**



Sem	Subject Code	Sr No	Course Out Comes
1	01CE0101	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
	01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
	01CE0101	CO3 :	Express and Distinguish various loops in C language (Analyze).
	01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures(Apply)
	01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
	01CE0101	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
	01CI0101	CO1 :	Recognize importance of Civil engineering and its day to day applications.
	01CI0101	CO2 :	Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
	01CI0101	CO3 :	Describe qualitative comparison between different materials and its selection.
	01CI0101	CO4 :	Analyse the water resources, its harvesting and its consumptive use.
	01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
	01CI0101	CO6 :	Acquaint with the various modes of transportation.
	01CR0101	CO1 :	Understands how to use different tools of language in order to communicate effectively. (Understanding)
	01CR0101	CO2 :	Applies appropriate grammatical structures and a wide range of vocabulary in spoken and written discourse. (Applying)
	01CR0101	CO3 :	Choose appropriate alternatives in personal and professional life. (Analyze)
	01CR0101	CO4 :	Displaying the best of the professional attitude and behavior. (Implying)
	01GS0102	CO1 :	To gain the knowledge of basic chemistry which includes molecules and their reactions
	01GS0102	CO2 :	Demonstrate the knowledge of fundamentals of phase equilibria and identify the various reasons behind corrosion
	01GS0102	CO3 :	Understand chemistry behind response of photons and identify the various method to measure their intensity
	01GS0102	CO4 :	Identify as well as classify the different types of bonds and their characteristics
	01GS0102	CO5 :	To understand the thermodynamics behind chemical reactions and how their state changes
	01MA0101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
	01MA0101	CO2 :	apply and solve first order differential equations to real life problems
	01MA0101	CO3 :	.Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
	01MA0101	CO4 :	Apply partial differentiation to evaluate equations of tangent plane and normal line for given surface.
	01MA0101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
	01MA0101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.



	01ME0101	CO1 :	Understand basic terminologies and fundamentals of mechanical system by correlating science concept.
	01ME0101	CO2 :	Apply the governing laws of mechanical engineering to find solution of different systems.
	01ME0101	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.
	01ME0101	CO4 :	Identify functional characteristics of various mechanisms.
	01ME0101	CO5 :	Analyze the various energy conversion cycles and systems.
2	01EE0103	CO1 :	Recognize importance of electrical energy and its day to day applications. (Understand)
	01EE0103	CO2 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions. (Apply)
	01EE0103	CO3 :	Analyse and solve DC Circuits, AC Single phase and magnetic circuits. (Analyse)
	01EE0103	CO4 :	Explain the need of batteries, its characteristics and charging methods. (Remember/Knowledge)
	01EE0103	CO5 :	Perceive the detail understanding of construction, operation and applications of various components like Diode, BJT and Op-Amp. (Understand)
	01EE0103	CO6 :	Recognize basic electronic devices used in various circuits. (Understand)
	01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
	01EN0101	CO2 :	Know the importance of natural resources for the sustainable development of life.
	01EN0101	CO3 :	Understand the effect of growing population on the Environment.
	01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
	01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
	01MA0151	CO1 :	Explain the linear dependence of vectors of different vector space.
	01MA0151	CO2 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.
	01MA0151	CO3 :	Understand the role of multiple integral in finding volume of three dimensional objects, finding area between to two curves, finding moment of inertia etc.
	01MA0151	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
	01MA0151	CO5 :	Check the convergence and divergence of various functions which are expandable in infinite terms.
	01MA0151	CO6 :	Gain the fundamental knowledge about special function like Beta and Gamma and its applications.
	01ME0102	CO1 :	Interpret engineering drawings using fundamental technical mathematics.
	01ME0102	CO2 :	Comprehend the theory of projection.
	01ME0102	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
	01ME0102	CO4 :	To improve their technical communication skill in the form of communicative drawings
	01ME0102	CO5 :	Construct basic and intermediate geometry.



	01ME0102	CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.
	01ME0104	CO1 :	Learn about Application of hand tools and power tools.
	01ME0104	CO2 :	Learn about various operations of machine tools.
	01ME0104	CO3 :	Selection of processes and steps for specific operation
	01ME0104	CO4 :	Knowledge and awareness about various safety related operation
	01SL0102	CO1 :	To enhance reading skills for academic purposes
	01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes
	01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
	01SL0102	CO4 :	To express their ideas in formal, academic written form
	01SL0103	CO1 :	Develop speaking competence for academic purpose
	01SL0103	CO2 :	Speak on a given topic in the context of technology
	01SL0103	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements
	01SL0103	CO4 :	Enhance the ability to make a presentation on a given topic
<b>3</b>	01CH0301	CO1 :	To create a vision of understanding the momentum transfer process.
	01CH0301	CO2 :	To analyze fluid flow concepts.
	01CH0301	CO3 :	To review the practical importance and relevance of fluid flow in process industry.
	01CH0301	CO4 :	To be able to utilize the technological methods in problem solving in process plant.
	01CH0301	CO5 :	To build a bridge between theoretical and practical concepts used in industry.
	01CH0301	CO6 :	To understand the behaviour of fluid phase operations going in an industry.
	01CH0302	CO0 :	.
	01CH0302	CO1 :	Establish mathematical methodologies for the computation of material balances and energy balances
	01CH0302	CO2 :	Present an overview of industrial chemical processes
	01CH0302	CO3 :	Develop an in depth understanding of the basic principles of chemical engineering calculations
	01CH0302	CO4 :	Solve material and energy balance problems.
	01CH0302	CO5 :	Evaluate their own solutions and those of others to find and correct errors.
	01CH0303	CO1 :	To build basic knowledge of various mechanical operations.
	01CH0303	CO2 :	To review the practical importance and relevance of unit operations used for crushing, grinding and size separation in chemical industry.
	01CH0303	CO3 :	To utilize the technological methods related to unit operations in process plant.
	01CH0303	CO4 :	To study a detailed overview of equipment used to perform various mechanical operations and problems associated during the implementation and applications.
	01CH0304	CO1 :	To build a basic knowledge of the process carried out in chemical industry.
	01CH0304	CO2 :	To review the practical importance and relevance of process taking place in chemical industry.
	01CH0304	CO3 :	To be able to utilize the technological methods in problem solving in process plant.





	01CH0304	CO4 :	To study about the salient features of the process.
	01CH0304	CO5 :	To build a bridge between theoretical and practical concept used in industry.
	01CH0305	CO1 :	Analyze the broad scope of roles played by Chemical Engineering in the society.
	01CH0305	CO2 :	Recognize the main drivers for conducting projects in chemical engineering.
	01CH0305	CO3 :	Evaluate how human variation impacts on chemical engineers and society.
	01CH0305	CO4 :	Applying some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real-world problems.
	01CR0302	CO1 :	Express the basics of human values.
	01CR0302	CO2 :	Articulate human values and grow as responsible human beings in the society
	01CR0302	CO3 :	Develop ethical conduct and deliver their professional duties.
	01CR0302	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level
	01MA0301	CO1 :	Expand Various functions in terms of sine and cosine functions
	01MA0301	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations
	01MA0301	CO3 :	Apply Laplace transform & series solution to solve differential equations.
	01MA0301	CO4 :	Apply the knowledge of differential equations and its solutions to evaluate engineering problems
<b>4</b>	01CH0401	CO1 :	Apply basic principles of thermodynamics in engineering
	01CH0401	CO2 :	Create mathematical models for the calculation of heat and work association for any process changes
	01CH0401	CO3 :	Calculate properties of pure compounds using different models of equations of state and other mathematical models
	01CH0401	CO4 :	Understand the interaction of heat during the process (chemical or physical) and able to apply appropriate model to calculate the energy requirement of any process
	01CH0401	CO5 :	Understanding of the fundamental principles of chemical engineering thermodynamics and its laws.
	01CH0402	CO1 :	To build basic knowledge and understand the concepts of the material composition.
	01CH0402	CO2 :	To evaluate the practical importance and relevance of properties of materials and its application in chemical industry.
	01CH0402	CO3 :	To analyze the technological methods related to material strength
	01CH0402	CO4 :	To discover the reasons for existence of various material properties
	01CH0402	CO5 :	To create a bridge between theoretical and practical concept used in industry.
	01CH0403	CO1 :	Understand three different modes of Heat Transfer viz Conduction, Convection & Radiation and Distinguish them.
	01CH0403	CO2 :	Apply theoretical knowledge of governing equations to solve practical engineering problems and understand about different types of convection.
	01CH0403	CO3 :	To analyze the various technological methods which includes Evaporation, Boiling & Condensation operations to increases the efficiency of heat transfer related to chemical industry
	01CH0403	CO4 :	Students will be able to Apply the knowledge of Radiation to calculate and minimize the radiative heat losses from heated objects/pipelines/reactors



	01CH0403	CO5 :	Students will be able to design shell and tube Heat Exchangers as per the given requirement.
	01CH0404	CO1 :	Understand the bonding fundamentals for both ionic and covalent compounds, including electronegativities, bond distances and bond energies
	01CH0404	CO2 :	Apply the fundamentals of the chemistry of main group elements and important real world applications of many of these species
	01CH0404	CO3 :	Analyze the understanding of organic mechanisms to predict the outcome of reactions
	01CH0404	CO4 :	Design synthesis of organic molecules
	01CH0404	CO5 :	Determine the structure of organic molecules using IR and NMR spectroscopic techniques
	01CH0405	CO1 :	Analyze the broad scope of roles played by Chemical Engineering in the society.
	01CH0405	CO2 :	Recognize the main drivers for conducting projects in chemical engineering.
	01CH0405	CO3 :	Evaluate how human variation impacts on chemical engineers and society.
	01CH0405	CO4 :	Applying some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real-world problems.
	01MA0281	CO0 :	-----
	01MA0281	CO1 :	Understand the basic concepts of probability and distribution to realize the logic of data sciences
	01MA0281	CO2 :	"Apply the concept of Data representation and Analysis in various field of engineering like image processing etc."
	01MA0281	CO3 :	"Apply concept of Correlation and Regression in result analysis and Business forecasting using EXCEL."
	01MA0281	CO4 :	Analyse errors for accuracy and precision of solutions to hike up the level of accuracy in daily calculations.
	01MA0281	CO5 :	"Apply curve fitting and interpolation techniques to approximate a function into any known curve to analyse their behaviours."
<b>5</b>	01CH0501	CO1 :	Demonstrate the basic knowledge of mass transfer operations and separation processes carried out in chemical process industries.
	01CH0501	CO2 :	Design of various mass transfer equipment's used in the chemical industries
	01CH0501	CO3 :	Calculate the driving forces behind the transport of mass from one phase to another.
	01CH0501	CO4 :	Demonstrate the knowledge of various physico-chemical separation techniques.
	01CH0502	CO1 :	Relate the role of Cleaner Production in sustainable development in Chemical Industries.
	01CH0502	CO2 :	Appraise the Energy conservation via Cleaner Technology Options.
	01CH0502	CO3 :	Connect Cleaner Production & Cleaner Technology as Remedial Measures for Mitigating Climate Change
	01CH0502	CO4 :	Judge the Green Process options available for the conventional processes being followed in Chemical Industries.
	01CH0503	CO1 :	Basic understanding of the applications of fundamental principles of chemical engineering thermodynamics and its laws.
	01CH0503	CO2 :	Calculate various phase and reaction equilibrium.
	01CH0503	CO3 :	Estimate various thermodynamic properties, fugacity and activity coefficient



	01CH0503	CO4 :	Apply basic concepts of liquid solution properties
	01CH0504	CO1 :	Develop Mathematical model of Chemical Engineering System.
	01CH0504	CO2 :	Examine order of Chemical Engineering system and generate the transfer function of systems.
	01CH0504	CO3 :	Examine the feedback controller effect on the response of a chemical process.
	01CH0504	CO4 :	Analyze stability of the control system
	01CH0504	CO5 :	Understand working principles of basic instruments available for flow, pressure, level and temperature measurement.
	01CH0505	CO1 :	Analyze Indian and International Safety Standards
	01CH0505	CO2 :	Detect the cause of accident and explain various engineering control methods
	01CH0505	CO3 :	Demonstrate the understanding of storage, handling and transportation of hazardous materials
	01CH0505	CO4 :	Classify fire extinguishing agent methods
	01CH1506	CO1 :	Analyze the broad scope of roles played by Chemical engineers in the society.
	01CH1506	CO2 :	Recognize the main drivers for conducting projects in chemical engineering
	01CH1506	CO3 :	Evaluate how human variation impacts on chemical engineers and society
	01CH1506	CO4 :	apply some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real world problems.
	01CR0501	CO1 :	Contrast and understand short pieces of business correspondence reports or proposals. (Understanding)
	01CR0501	CO2 :	Read and Categorize the extracts from business publications. Ask for the information required. (Analyzing)
	01CR0501	CO3 :	Listen to, understand and contribute to discussions in meetings. (Remembering)
	01CR0501	CO4 :	Prepare the presentation on a familiar topic. (Applying)
<b>6</b>	01CH0601	CO1 :	Identify suitable mass transfer operation.
	01CH0601	CO2 :	Represent a suitable mass transfer operation for particular separation process.
	01CH0601	CO3 :	To determine the use and implication of different mass transfer processes with suitable number of stages and desired type.
	01CH0601	CO4 :	Estimate number of stages and height of packed column in distillation and extraction operation.
	01CH0601	CO5 :	To choose specific mass transfer operation in particular process.
	01CH0601	CO6 :	Design and modify various phenomenon of mass transfer operations using advanced techniques.
	01CH0602	CO1 :	To build basic knowledge and Understanding of classification of reactions.
	01CH0602	CO2 :	Understand kinetics of competing reactions and their influence on product yield and selectivity.
	01CH0602	CO3 :	Understand fundamentals of kinetics including definitions of rate and forms of rate expressions and relationships between moles, concentration, extent of reaction and conversion.
	01CH0602	CO4 :	Derive batch, CSTR, and PFR performance equations from general material balance.



	01CH0603	CO1 :	Analyze, compare process equipment's and modify the design of existing equipment to new process conditions or new required capacity.
	01CH0603	CO2 :	Build a bridge between theoretical and practical concepts used for designing the equipment in any process industry
	01CH0603	CO3 :	Explain use of equipment design.
	01CH0603	CO4 :	Identify the importance of design concepts in process industry.
	01CH0606	CO1 :	To judge the development of bio process technology design and construction of fermentor.
	01CH0606	CO2 :	To predict the various media for Fermentation Process.
	01CH0606	CO3 :	To analyse the principles and kinetics of Sterilization methods.
	01CH0606	CO4 :	To compare the batch, fed-batch and continuous systems.
	01CH0606	CO5 :	To evaluate different mass transfer operations used in biochemical industries
	01CH0609	CO1 :	Analyze the broad scope of roles played by Chemical engineers in the society.
	01CH0609	CO2 :	Recognize the main drivers for conducting projects in chemical engineering
	01CH0609	CO3 :	Evaluate how human variation impacts on chemical engineers and society
	01CH0609	CO4 :	apply some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real world problems.
	01ES0601	CO1 :	To understand the availability of various Renewable Energy Resources.
	01ES0601	CO2 :	To understand how to harness these Energy Resources.
	01ES0601	CO3 :	To apply the principles to extract energy out of the resources.
	01ES0601	CO4 :	To analyze the concept of sustainable use of natural resources.
<b>7</b>	01CH0701	CO1 :	Identify the suitable process modelling approach for various processes.
	01CH0701	CO2 :	Construct the mathematical models for different processes.
	01CH0701	CO3 :	Plan the appropriate modelling and simulation methodology for respective system.
	01CH0701	CO4 :	Test and justify the developed model for a particular process.
	01CH0701	CO5 :	Design and rearrange the parameters based on the modelling approach.
	01CH0702	CO1 :	Analyze the residence time distribution studies for any flow reactor, to predict the deviation from ideal reactors by evaluating the dispersion number.
	01CH0702	CO2 :	Analyze the various contacting pattern for two phase system and predict the rate equation for heterogeneous reactions.
	01CH0702	CO3 :	Analyze the best kinetic regimes for mass transfer and reaction for a given reaction and predict the rate equation.
	01CH0702	CO4 :	Predict the rate-controlling step for the fluid - particle reactions.
	01CH0703	CO1 :	Analyze, compare process equipment's and modify the design of the existing equipment to the new process conditions or new required capacity.
	01CH0703	CO2 :	Build a bridge between theoretical and practical concepts used for designing the equipment in any process industry.
	01CH0703	CO3 :	Create understanding of equipment design with mechanical concepts.
	01CH0703	CO4 :	Identify the use of design concepts and relevant application of equipment design in process industry.
	01CH0704	CO1 :	Study the economic aspects of equipment selection
	01CH0704	CO2 :	Understand the concept of capital investment and capital returns for chemical industry.



	01CH0704	CO3 :	Apply the concepts to design a manufacturing plant.
	01CH0704	CO4 :	Evaluate the profitability of process industry projects using different measures and analyse market potential for process industry products
	01CH0705	CO1 :	Understand how a project has to be started, their pre-requirements, flowchart preparation, and economic calculation and solution.
	01CH0705	CO2 :	Conduct experiments to solve complex engineering problems effectively as an individual or team work.
	01CH0705	CO3 :	Perform as a leader with good ethical principles to meet societal needs in the field of chemical and allied engineering
	01CH0705	CO4 :	Present the results from the work comprehensively through presentation
	01CH0706	CO1 :	Understand general processing flow for various food products, physical principles of operation for various types of equipment.
	01CH0706	CO2 :	Impact of the processing on the physical, chemical and sensory properties of the food products.
	01CH0706	CO3 :	Compare results from own studies with results from other natural science and social science studies.
	01CH0706	CO4 :	Select the food processing method most suitable for specific application
	01CH0707	CO0 :	After completion of this course, student will be able to: 1. apply modern separation techniques in various applications 2. analyze and evaluate novel membranes for intended application 3. analyze and design pervaporation, chromatography and dialysis based separation processes 4. utilize the technological methods in problem solving in process plant.
	01CH0707	CO1 :	apply modern separation techniques in various applications
	01CH0707	CO2 :	analyze and evaluate novel membranes for intended application
	01CH0707	CO3 :	analyze and design pervaporation, chromatography and dialysis based separation processes
	01CH0707	CO4 :	utilize the technological methods in problem solving in process plant.
<b>8</b>	01CH0801	CO1 :	Identify the suitable optimization approach for engineering systems.
	01CH0801	CO2 :	Construct the optimization methodology for different processes.
	01CH0801	CO3 :	Plan the appropriate optimization methodology and execution.
	01CH0801	CO4 :	Test and justify the optimization technique.
	01CH0801	CO5 :	Design the system using optimization techniques and fine tuning of parameters.
	01CH0802	CO1 :	Setup overall balances for conservation of momentum, energy and mass.
	01CH0802	CO2 :	Reduce and solve the appropriate equations of change to obtain desired profiles for velocity, temperature and concentration.
	01CH0802	CO3 :	Utilize information obtained from solutions of the balance equations to obtain Engineering quantities of interest.
	01CH0802	CO4 :	Reduce and solve appropriate macroscopic balances for conservation of momentum, energy and mass.
	01CH0803	CO1 :	Understand the processing of crude oil through various processes.
	01CH0803	CO2 :	Preform the various testing methods for petroleum products
	01CH0803	CO3 :	Evaluate the significance of various standard specifications for fuels
	01CH0803	CO4 :	Analyze the various processes and unit operations in petrochemical industry



01CH0804	CO1 :	prepare a detailed report on the project work carried out by the students.
01CH0804	CO2 :	Conduct experiments to solve complex engineering problems effectively as an individual or team work.
01CH0804	CO3 :	Perform as a leader with good ethical principles to meet societal needs in the field of chemical engineering.
01CH0804	CO4 :	Present the results from the work comprehensively through presentation
01CH0804	CO5 :	Present his/her work in a conference or publish the work in a peer reviewed journal
01CH0805	CO1 :	Explain the basic methodologies in synthesis and characterization of various polymers
01CH0805	CO2 :	Demonstrate the knowledge of application based modifications in polymers
01CH0805	CO3 :	Analyse and explain synthesis, properties, and characterization of nanomaterials and their applications.
01CH0806	CO1 :	Use reactions and unit operations steps in manufacturing of various fertilizers
01CH0806	CO2 :	Identify engineering problems in fertilizer manufacturing.
01CH0806	CO3 :	Select appropriate synthesis fertilizer.
01CH0806	CO4 :	Analyse the recent advancements in fertilizer industry



**Marwadi**  
University

**Bachelor of Technology**

**Department of Chemical Engineering**

**Course Outcome**

**Batch**

**(2018-19)**

**B.Tech. in Chemical Engineering**



Sem	Subject Code	Sr No	Course Out Comes
1	01CI0101	CO1 :	Recognize importance of Civil engineering and its day to day applications.
	01CI0101	CO2 :	Interpret the plan/maps, locate the objects on ground from map and from site to on paper plan/map.
	01CI0101	CO3 :	Describe qualitative comparison between different materials and its selection.
	01CI0101	CO4 :	Analyze the water resources, its harvesting and its consumptive use.
	01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
	01CI0101	CO6 :	Acquaint with the various modes of transportation.
	01CR0103	CO1 :	Understand importance of role of Values in developing self
	01CR0103	CO2 :	Inculcate right values, ethics, attitudes, manners and behaviours for life
	01CR0103	CO3 :	Respond and relate with expectations, competitions and power of networking
	01EN0101	CO1 :	Understand and realize the multidisciplinary nature of Environment & its components.
	01EN0101	CO2 :	Know the importance of natural resources for the sustainable development of life.
	01EN0101	CO3 :	Understand the effect of growing population on the Environment.
	01EN0101	CO4 :	Classify the different types of pollution and measure to control pollution
	01EN0101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
	01GS0102	CO1 :	To gain the knowledge of basic chemistry which includes molecules and their reactions
	01GS0102	CO2 :	Demonstrate the knowledge of fundamentals of phase equilibria and identify the various reasons behind corrosion
	01GS0102	CO3 :	Understand chemistry behind response of photons and identify the various method to measure their intensity
	01GS0102	CO4 :	Identify as well as classify the different types of bonds and their characteristics
	01GS0102	CO5 :	To understand the thermodynamics behind chemical reactions and how their state changes
	01MA1101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
	01MA1101	CO2 :	Apply and solve first order differential equations to real life problems
	01MA1101	CO3 :	Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
	01MA1101	CO4 :	Apply Multiple Integral to evaluate the Surface Area and Volume of any 3D objects.
	01MA1101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
	01MA1101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
	01ME0101	CO1 :	Understand basic terminologies and fundamentals of mechanical system by correlating science concept.
	01ME0101	CO2 :	Apply the governing laws of mechanical engineering to find solution of





		different systems.
01ME0101	CO3 :	Identify the broad context of Mechanical engineering problems and identifying possible contributing factors.
01ME0101	CO4 :	Identify functional characteristics of various mechanisms.
01ME0101	CO5 :	Analyze the various energy conversion cycles and systems.
01SL0102	CO1 :	To enhance reading skills for academic purposes
01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes
01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and technology related content
01SL0102	CO4 :	To express their ideas in formal, academic written form
01SL0103	CO1 :	Develop speaking competence for academic purpose
01SL0103	CO2 :	Speak on a given topic in the context of technology
01SL0103	CO3 :	Express ideas in an organized way for conversations and interactions related to academic requirements
01SL0103	CO4 :	Enhance the ability to make a presentation on a given topic
2		
01CE0101	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
01CE0101	CO3 :	Express and Distinguish various loops in C language (Analyze).
01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures(Apply)
01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
01CE0101	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
01EE0103	CO1 :	Recognize importance of electrical energy and its day to day applications. (Understand)
01EE0103	CO2 :	Interpret the role of resistor, capacitor and inductor and their behaviour under various system conditions. (Apply)
01EE0103	CO3 :	Analyse and solve DC Circuits, AC Single phase and magnetic circuits. (Analyse)
01EE0103	CO4 :	Explain the need of batteries, its characteristics and charging methods. (Remember/Knowledge)
01EE0103	CO5 :	Perceive the detail understanding of construction, operation and applications of various components like Diode, BJT and Op-Amp. (Understand)
01EE0103	CO6 :	Recognize basic electronic devices used in various circuits. (Understand)
01MA1151	CO1 :	Explain the linear dependence of vectors of different vector space.
01MA1151	CO2 :	Apply the concept of Eigen values and vectors in various field of engineering like control theory, vibration analysis, quantum mechanics etc
01MA1151	CO3 :	Understand role of mathematical modeling in taking care of different issues related to heat transfer, mechanics, momentum, etc.
01MA1151	CO4 :	Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
01MA1151	CO5 :	Determine convergence of improper integrals and explain special functions like Beta, Gama and error functions.
01MA1151	CO6 :	Apply Gauss elimination to solve linear system of equations
01ME0102	CO1 :	Interpret engineering drawings using fundamental technical mathematics.



	01ME0102	CO2 :	Comprehend the theory of projection.
	01ME0102	CO3 :	To improve their visualization skills so that they can apply these skills in developing new products.
	01ME0102	CO4 :	To improve their technical communication skill in the form of communicative drawings
	01ME0102	CO5 :	Construct basic and intermediate geometry.
	01ME0102	CO6 :	To know, understand and able to define the conventions and the methods of engineering drawing.
	01ME0104	CO1 :	Learn about Application of hand tools and power tools.
	01ME0104	CO2 :	Learn about various operations of machine tools.
	01ME0104	CO3 :	Selection of processes and steps for specific operation
	01ME0104	CO4 :	Knowledge and awareness about various safety related operation
<b>3</b>	01CH0301	CO1 :	To create a vision of understanding the momentum transfer process.
	01CH0301	CO2 :	To analyze fluid flow concepts.
	01CH0301	CO3 :	To review the practical importance and relevance of fluid flow in process industry.
	01CH0301	CO4 :	To be able to utilize the technological methods in problem solving in process plant.
	01CH0301	CO5 :	To build a bridge between theoretical and practical concepts used in industry.
	01CH0301	CO6 :	To understand the behaviour of fluid phase operations going in an industry.
	01CH0302	CO0 :	.
	01CH0302	CO1 :	Establish mathematical methodologies for the computation of material balances and energy balances
	01CH0302	CO2 :	Present an overview of industrial chemical processes
	01CH0302	CO3 :	Develop an in depth understanding of the basic principles of chemical engineering calculations
	01CH0302	CO4 :	Solve material and energy balance problems.
	01CH0302	CO5 :	Evaluate their own solutions and those of others to find and correct errors.
	01CH0303	CO1 :	To build basic knowledge of various mechanical operations.
	01CH0303	CO2 :	To review the practical importance and relevance of unit operations used for crushing, grinding and size separation in chemical industry.
	01CH0303	CO3 :	To utilize the technological methods related to unit operations in process plant.
	01CH0303	CO4 :	To study a detailed overview of equipment used to perform various mechanical operations and problems associated during the implementation and applications.
	01CH0305	CO1 :	Analyze the broad scope of roles played by Chemical Engineering in the society.
	01CH0305	CO2 :	Recognize the main drivers for conducting projects in chemical engineering.
	01CH0305	CO3 :	Evaluate how human variation impacts on chemical engineers and society.
	01CH0305	CO4 :	Applying some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real-world problems.
	01CH0306	CO1 :	Compare the classical and modern analytical techniques
	01CH0306	CO2 :	Point out the various applications of electrochemistry, fuels, analytical techniques and environmental chemistry



	01CH0306	CO3 :	Estimate the combustion parameters, instrumental methods and possible solutions to environmental issues
	01CH0306	CO4 :	Analyze the various problems and solutions related to fuels, pollutions and analysis
	01CH0306	CO5 :	Predict the various instrumental methods of analysis.
	01CR0302	CO1 :	Express the basics of human values.
	01CR0302	CO2 :	Articulate human values and grow as responsible human beings in the society
	01CR0302	CO3 :	Develop ethical conduct and deliver their professional duties.
	01CR0302	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level
	01MA0301	CO1 :	Expand Various functions in terms of sine and cosine functions
	01MA0301	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations
	01MA0301	CO3 :	Apply Laplace transform & series solution to solve differential equations.
	01MA0301	CO4 :	Apply the knowledge of differential equations and its solutions to evaluate engineering problems
<b>4</b>	01CH0401	CO1 :	Apply basic principles of thermodynamics in engineering
	01CH0401	CO2 :	Create mathematical models for the calculation of heat and work association for any process changes
	01CH0401	CO3 :	Calculate properties of pure compounds using different models of equations of state and other mathematical models
	01CH0401	CO4 :	Understand the interaction of heat during the process (chemical or physical) and able to apply appropriate model to calculate the energy requirement of any process
	01CH0401	CO5 :	Understanding of the fundamental principles of chemical engineering thermodynamics and its laws.
	01CH0402	CO1 :	To build basic knowledge and understand the concepts of the material composition.
	01CH0402	CO2 :	To evaluate the practical importance and relevance of properties of materials and its application in chemical industry.
	01CH0402	CO3 :	To analyze the technological methods related to material strength
	01CH0402	CO4 :	To discover the reasons for existence of various material properties
	01CH0402	CO5 :	To create a bridge between theoretical and practical concept used in industry.
	01CH0405	CO1 :	Analyze the broad scope of roles played by Chemical Engineering in the society.
	01CH0405	CO2 :	Recognize the main drivers for conducting projects in chemical engineering.
	01CH0405	CO3 :	Evaluate how human variation impacts on chemical engineers and society.
	01CH0405	CO4 :	Applying some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real-world problems.
	01CH0406	CO1 :	Explain the basic mechanism of mass transfer including diffusion and convective mass transfer
	01CH0406	CO2 :	Solve the problems related to mass transfer coefficient and interphase mass transfer.
	01CH0406	CO3 :	Understand the gas-liquid contacting process and solve related problems
	01CH0406	CO4 :	Solve problems on gas absorption and design gas absorption column.



	01CH0406	CO5 :	Understand Drying and Crystallization operation.
	01CH0407	CO1 :	Understand principle of various modes of heat transfer with relation to existing energy system.
	01CH0407	CO2 :	Apply theoretical knowledge of governing equations to solve practical engineering problems.
	01CH0407	CO3 :	Analyze the various technological methods related to heat transfer for the benefits of the process plant.
	01CH0407	CO4 :	Evaluate the outcomes after reviewing the problems associated at preliminary stage of design of heat transfer equipment.
	01MA0281	CO0 :	-----
	01MA0281	CO1 :	Understand the basic concepts of probability and distribution to realize the logic of data sciences
	01MA0281	CO2 :	"Apply the concept of Data representation and Analysis in various field of engineering like image processing etc."
	01MA0281	CO3 :	"Apply concept of Correlation and Regression in result analysis and Business forecasting using EXCEL."
	01MA0281	CO4 :	Analyse errors for accuracy and precision of solutions to hike up the level of accuracy in daily calculations.
	01MA0281	CO5 :	"Apply curve fitting and interpolation techniques to approximate a function into any known curve to analyse their behaviours."
<b>5</b>	01CH0301	CO1 :	To create a vision of understanding the momentum transfer process.
	01CH0301	CO2 :	To analyze fluid flow concepts.
	01CH0301	CO3 :	To review the practical importance and relevance of fluid flow in process industry.
	01CH0301	CO4 :	To be able to utilize the technological methods in problem solving in process plant.
	01CH0301	CO5 :	To build a bridge between theoretical and practical concepts used in industry.
	01CH0301	CO6 :	To understand the behaviour of fluid phase operations going in an industry.
	01CH0303	CO1 :	To build basic knowledge of various mechanical operations.
	01CH0303	CO2 :	To review the practical importance and relevance of unit operations used for crushing, grinding and size separation in chemical industry.
	01CH0303	CO3 :	To utilize the technological methods related to unit operations in process plant.
	01CH0303	CO4 :	To study a detailed overview of equipment used to perform various mechanical operations and problems associated during the implementation and applications.
	01CH0305	CO1 :	Analyze the broad scope of roles played by Chemical Engineering in the society.
	01CH0305	CO2 :	Recognize the main drivers for conducting projects in chemical engineering.
	01CH0305	CO3 :	Evaluate how human variation impacts on chemical engineers and society.
	01CH0305	CO4 :	Applying some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real-world problems.
	01CH0306	CO1 :	Compare the classical and modern analytical techniques
	01CH0306	CO2 :	Point out the various applications of electrochemistry, fuels, analytical techniques and environmental chemistry
	01CH0306	CO3 :	Estimate the combustion parameters, instrumental methods and possible solutions to environmental issues



01CH0306	CO4 :	Analyze the various problems and solutions related to fuels, pollutions and analysis
01CH0306	CO5 :	Predict the various instrumental methods of analysis.
01CH0502	CO1 :	Relate the role of Cleaner Production in sustainable development in Chemical Industries.
01CH0502	CO2 :	Appraise the Energy conservation via Cleaner Technology Options.
01CH0502	CO3 :	Connect Cleaner Production & Cleaner Technology as Remedial Measures for Mitigating Climate Change
01CH0502	CO4 :	Judge the Green Process options available for the conventional processes being followed in Chemical Industries.
01CH0503	CO1 :	Basic understanding of the applications of fundamental principles of chemical engineering thermodynamics and its laws.
01CH0503	CO2 :	Calculate various phase and reaction equilibrium.
01CH0503	CO3 :	Estimate various thermodynamic properties, fugacity and activity coefficient
01CH0503	CO4 :	Apply basic concepts of liquid solution properties
01CH0504	CO1 :	Develop Mathematical model of Chemical Engineering System.
01CH0504	CO2 :	Examine order of Chemical Engineering system and generate the transfer function of systems.
01CH0504	CO3 :	Examine the feedback controller effect on the response of a chemical process.
01CH0504	CO4 :	Analyze stability of the control system
01CH0504	CO5 :	Understand working principles of basic instruments available for flow, pressure, level and temperature measurement.
01CH0505	CO1 :	Analyze Indian and International Safety Standards
01CH0505	CO2 :	Detect the cause of accident and explain various engineering control methods
01CH0505	CO3 :	Demonstrate the understanding of storage, handling and transportation of hazardous materials
01CH0505	CO4 :	Classify fire extinguishing agent methods
01CH0507	CO1 :	Identify suitable mass transfer operation.
01CH0507	CO2 :	Represent a suitable mass transfer operation for particular separation process.
01CH0507	CO3 :	Determine the use and implication of different mass transfer processes with suitable number of stages and desired type.
01CH0507	CO4 :	Estimate number of stages and height of packed column in distillation and extraction operation.
01CH0507	CO5 :	Choose specific mass transfer operation in particular process.
01CH0507	CO6 :	Design and modify various phenomenons of mass transfer operations using advanced techniques.
01CH1506	CO1 :	Analyze the broad scope of roles played by Chemical engineers in the society.
01CH1506	CO2 :	Recognize the main drivers for conducting projects in chemical engineering
01CH1506	CO3 :	Evaluate how human variation impacts on chemical engineers and society
01CH1506	CO4 :	apply some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real world problems.
01CR0302	CO1 :	Express the basics of human values.
01CR0302	CO2 :	Articulate human values and grow as responsible human beings in the society



	01CR0302	CO3 :	Develop ethical conduct and deliver their professional duties.
	01CR0302	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level
	01CR0501	CO1 :	Contrast and understand short pieces of business correspondence reports or proposals. (Understanding)
	01CR0501	CO2 :	Read and Categorize the extracts from business publications. Ask for the information required. (Analyzing)
	01CR0501	CO3 :	Listen to, understand and contribute to discussions in meetings. (Remembering)
	01CR0501	CO4 :	Prepare the presentation on a familiar topic. (Applying)
<b>6</b>	01CH0602	CO1 :	To build basic knowledge and Understanding of classification of reactions.
	01CH0602	CO2 :	Understand kinetics of competing reactions and their influence on product yield and selectivity.
	01CH0602	CO3 :	Understand fundamentals of kinetics including definitions of rate and forms of rate expressions and relationships between moles, concentration, extent of reaction and conversion.
	01CH0602	CO4 :	Derive batch, CSTR, and PFR performance equations from general material balance.
	01CH0603	CO1 :	Analyze, compare process equipment's and modify the design of existing equipment to new process conditions or new required capacity.
	01CH0603	CO2 :	Build a bridge between theoretical and practical concepts used for designing the equipment in any process industry
	01CH0603	CO3 :	Explain use of equipment design.
	01CH0603	CO4 :	Identify the importance of design concepts in process industry.
	01CH0604	CO1 :	To gain the the basic knowledge of unit operation used in chemical engineering
	01CH0604	CO2 :	Understand the applications of various equipment used to carry out various operations heat and mass transfer.
	01CH0604	CO3 :	Apply the knowledge gain through various operations performed on fluid flow, Mass Transfer and Heat Transfer laboratory to solve the problems occurring during these operations
	01CH0604	CO4 :	Analyse the use of fundamentals processes at the industrial level to increase the efficiency
	01CH0604	CO5 :	Evaluate the formulation process with the development of qualified product
	01CH0605	CO1 :	Understand the different roles of, and relations between, firms, governmental agencies, not-for-profit organisations and other actors in relation to issues concerning environmental and natural resource management and sustainability.
	01CH0605	CO2 :	Describe the motivating factors and processes for integrating environmental and natural resource management and sustainability issues with the strategies, operations management and global surveillance of organisations.
	01CH0605	CO3 :	Analyze results from own studies with results from other natural science and social science studies.
	01CH0605	CO4 :	Apply the principles and create a project and firmly establish the study in a theoretical basis within environmental management and sustainable development
	01CH0606	CO1 :	To judge the development of bio process technology design and



		construction of fermentor.
01CH0606	CO2 :	To predict the various media for Fermentation Process.
01CH0606	CO3 :	To analyse the principles and kinetics of Sterilization methods.
01CH0606	CO4 :	To compare the batch, fed-batch and continuous systems.
01CH0606	CO5 :	To evaluate different mass transfer operations used in biochemical industries
01CH0608	CO1 :	Understand the concept of unit operations and unit processes
01CH0608	CO2 :	Develop ability to read and abstract the process flow diagrams.
01CH0608	CO3 :	Inspect different feed preparation, separation and purification steps involved in the manufacturing of organic and inorganic chemicals.
01CH0608	CO4 :	Analyse the salient features of the process.
01CH0609	CO1 :	Analyze the broad scope of roles played by Chemical engineers in the society.
01CH0609	CO2 :	Recognize the main drivers for conducting projects in chemical engineering
01CH0609	CO3 :	Evaluate how human variation impacts on chemical engineers and society
01CH0609	CO4 :	apply some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real world problems.
01ES0601	CO1 :	To understand the availability of various Renewable Energy Resources.
01ES0601	CO2 :	To understand how to harness these Energy Resources.
01ES0601	CO3 :	To apply the principles to extract energy out of the resources.
01ES0601	CO4 :	To analyze the concept of sustainable use of natural resources.
<b>7</b>		
01CH0701	CO1 :	Identify the suitable process modelling approach for various processes.
01CH0701	CO2 :	Construct the mathematical models for different processes.
01CH0701	CO3 :	Plan the appropriate modelling and simulation methodology for respective system.
01CH0701	CO4 :	Test and justify the developed model for a particular process.
01CH0701	CO5 :	Design and rearrange the parameters based on the modelling approach.
01CH0702	CO1 :	Analyze the residence time distribution studies for any flow reactor, to predict the deviation from ideal reactors by evaluating the dispersion number.
01CH0702	CO2 :	Analyze the various contacting pattern for two phase system and predict the rate equation for heterogeneous reactions.
01CH0702	CO3 :	Analyze the best kinetic regimes for mass transfer and reaction for a given reaction and predict the rate equation.
01CH0702	CO4 :	Predict the rate-controlling step for the fluid - particle reactions.
01CH0703	CO1 :	Analyze, compare process equipment's and modify the design of the existing equipment to the new process conditions or new required capacity.
01CH0703	CO2 :	Build a bridge between theoretical and practical concepts used for designing the equipment in any process industry.
01CH0703	CO3 :	Create understanding of equipment design with mechanical concepts.
01CH0703	CO4 :	Identify the use of design concepts and relevant application of equipment design in process industry.
01CH0704	CO1 :	Study the economic aspects of equipment selection
01CH0704	CO2 :	Understand the concept of capital investment and capital returns for chemical industry.
01CH0704	CO3 :	Apply the concepts to design a manufacturing plant.
01CH0704	CO4 :	Evaluate the profitability of process industry projects using different



		measures and analyse market potential for process industry products	
01CH0705	CO1 :	Understand how a project has to be started, their pre-requirements, flowchart preparation, and economic calculation and solution.	
01CH0705	CO2 :	Conduct experiments to solve complex engineering problems effectively as an individual or team work.	
01CH0705	CO3 :	Perform as a leader with good ethical principles to meet societal needs in the field of chemical and allied engineering	
01CH0705	CO4 :	Present the results from the work comprehensively through presentation	
01CH0706	CO1 :	Understand general processing flow for various food products, physical principles of operation for various types of equipment.	
01CH0706	CO2 :	Impact of the processing on the physical, chemical and sensory properties of the food products.	
01CH0706	CO3 :	Compare results from own studies with results from other natural science and social science studies.	
01CH0706	CO4 :	Select the food processing method most suitable for specific application	
01CH0707	CO0 :	After completion of this course, student will be able to: 1. apply modern separation techniques in various applications 2. analyze and evaluate novel membranes for intended application 3. analyze and design pervaporation, chromatography and dialysis based separation processes 4. utilize the technological methods in problem solving in process plant.	
01CH0707	CO1 :	apply modern separation techniques in various applications	
01CH0707	CO2 :	analyze and evaluate novel membranes for intended application	
01CH0707	CO3 :	analyze and design pervaporation, chromatography and dialysis based separation processes	
01CH0707	CO4 :	utilize the technological methods in problem solving in process plant.	
<b>8</b>	01CH0801	CO1 :	Identify the suitable optimization approach for engineering systems.
	01CH0801	CO2 :	Construct the optimization methodology for different processes.
	01CH0801	CO3 :	Plan the appropriate optimization methodology and execution.
	01CH0801	CO4 :	Test and justify the optimization technique.
	01CH0801	CO5 :	Design the system using optimization techniques and fine tuning of parameters.
	01CH0802	CO1 :	Setup overall balances for conservation of momentum, energy and mass.
	01CH0802	CO2 :	Reduce and solve the appropriate equations of change to obtain desired profiles for velocity, temperature and concentration.
	01CH0802	CO3 :	Utilize information obtained from solutions of the balance equations to obtain Engineering quantities of interest.
	01CH0802	CO4 :	Reduce and solve appropriate macroscopic balances for conservation of momentum, energy and mass.
	01CH0803	CO1 :	Understand the processing of crude oil through various processes.
	01CH0803	CO2 :	Preform the various testing methods for petroleum products
	01CH0803	CO3 :	Evaluate the significance of various standard specifications for fuels
	01CH0803	CO4 :	Analyze the various processes and unit operations in petrochemical industry
	01CH0804	CO1 :	prepare a detailed report on the project work carried out by the students.
	01CH0804	CO2 :	Conduct experiments to solve complex engineering problems effectively as an individual or team work.





01CH0804	CO3 :	Perform as a leader with good ethical principles to meet societal needs in the field of chemical engineering.
01CH0804	CO4 :	Present the results from the work comprehensively through presentation
01CH0804	CO5 :	Present his/her work in a conference or publish the work in a peer reviewed journal
01CH0805	CO1 :	Explain the basic methodologies in synthesis and characterization of various polymers
01CH0805	CO2 :	Demonstrate the knowledge of application based modifications in polymers
01CH0805	CO3 :	Analyse and explain synthesis, properties, and characterization of nanomaterials and their applications.
01CH0806	CO1 :	Use reactions and unit operations steps in manufacturing of various fertilizers
01CH0806	CO2 :	Identify engineering problems in fertilizer manufacturing.
01CH0806	CO3 :	Select appropriate synthesis fertilizer.
01CH0806	CO4 :	Analyse the recent advancements in fertilizer industry



**Marwadi**  
University

**Bachelor of Technology**

**Department of Chemical Engineering**

**Course Outcome**

**Batch**

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**B.Tech. in Chemical Engineering**



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	01CI0101	CO5 :	Create & interpret building planning and will be able to draw plan, section and elevation.
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	01MA1101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
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<b>2</b>	01CE0101	CO1 :	Express programming problems logically through flow charts and algorithms (Understand).
	01CE0101	CO2 :	Identify various conditional control structures and jumping structures and use them. (Remember)
	01CE0101	CO3 :	Express and Distinguish various loops in C language (Analyze).
	01CE0101	CO4 :	Demonstrate the usage of concepts like strings, arrays, pointers, Structures(Apply)
	01CE0101	CO5 :	Select the appropriate user defined function category.(Evaluate)
	01CE0101	CO6 :	Develop the programs on dynamic memory allocations and Files.(Create)
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	01CH0101	CO2 :	Demonstrate the knowledge of fundamentals of water technology and identify the various water treatment methods.
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	01MA1151	CO6 :	Apply Gauss elimination to solve linear system of equations
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	01ME0102	CO2 :	Comprehend the theory of projection.
	01ME0102	CO3 :	To improve their visualization skills so that they can apply these skills in



		developing new products.
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<b>3</b>		
01CH0301	CO1 :	To create a vision of understanding the momentum transfer process.
01CH0301	CO2 :	To analyze fluid flow concepts.
01CH0301	CO3 :	To review the practical importance and relevance of fluid flow in process industry.
01CH0301	CO4 :	To be able to utilize the technological methods in problem solving in process plant.
01CH0301	CO5 :	To build a bridge between theoretical and practical concepts used in industry.
01CH0301	CO6 :	To understand the behaviour of fluid phase operations going in an industry.
01CH0302	CO0 :	.
01CH0302	CO1 :	Establish mathematical methodologies for the computation of material balances and energy balances
01CH0302	CO2 :	Present an overview of industrial chemical processes
01CH0302	CO3 :	Develop an in depth understanding of the basic principles of chemical engineering calculations
01CH0302	CO4 :	Solve material and energy balance problems.
01CH0302	CO5 :	Evaluate their own solutions and those of others to find and correct errors.
01CH0303	CO1 :	To build basic knowledge of various mechanical operations.
01CH0303	CO2 :	To review the practical importance and relevance of unit operations used for crushing, grinding and size separation in chemical industry.
01CH0303	CO3 :	To utilize the technological methods related to unit operations in process plant.
01CH0303	CO4 :	To study a detailed overview of equipment used to perform various mechanical operations and problems associated during the implementation and applications.
01CH0305	CO1 :	Analyze the broad scope of roles played by Chemical Engineering in the society.
01CH0305	CO2 :	Recognize the main drivers for conducting projects in chemical engineering.
01CH0305	CO3 :	Evaluate how human variation impacts on chemical engineers and society.
01CH0305	CO4 :	Applying some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real-world problems.
01CH0306	CO1 :	Compare the classical and modern analytical techniques
01CH0306	CO2 :	Point out the various applications of electrochemistry, fuels, analytical techniques and environmental chemistry
01CH0306	CO3 :	Estimate the combustion parameters, instrumental methods and possible solutions to environmental issues
01CH0306	CO4 :	Analyze the various problems and solutions related to fuels, pollutions and analysis



	01CH0306	CO5 :	Predict the various instrumental methods of analysis.
	01CR0302	CO1 :	Express the basics of human values.
	01CR0302	CO2 :	Articulate human values and grow as responsible human beings in the society
	01CR0302	CO3 :	Develop ethical conduct and deliver their professional duties.
	01CR0302	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level
	01MA0301	CO1 :	Expand Various functions in terms of sine and cosine functions
	01MA0301	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations
	01MA0301	CO3 :	Apply Laplace transform & series solution to solve differential equations.
	01MA0301	CO4 :	Apply the knowledge of differential equations and its solutions to evaluate engineering problems
<b>4</b>	01CH0401	CO1 :	Apply basic principles of thermodynamics in engineering
	01CH0401	CO2 :	Create mathematical models for the calculation of heat and work association for any process changes
	01CH0401	CO3 :	Calculate properties of pure compounds using different models of equations of state and other mathematical models
	01CH0401	CO4 :	Understand the interaction of heat during the process (chemical or physical) and able to apply appropriate model to calculate the energy requirement of any process
	01CH0401	CO5 :	Understanding of the fundamental principles of chemical engineering thermodynamics and its laws.
	01CH0402	CO1 :	To build basic knowledge and understand the concepts of the material composition.
	01CH0402	CO2 :	To evaluate the practical importance and relevance of properties of materials and its application in chemical industry.
	01CH0402	CO3 :	To analyze the technological methods related to material strength
	01CH0402	CO4 :	To discover the reasons for existence of various material properties
	01CH0402	CO5 :	To create a bridge between theoretical and practical concept used in industry.
	01CH0405	CO1 :	Analyze the broad scope of roles played by Chemical Engineering in the society.
	01CH0405	CO2 :	Recognize the main drivers for conducting projects in chemical engineering.
	01CH0405	CO3 :	Evaluate how human variation impacts on chemical engineers and society.
	01CH0405	CO4 :	Applying some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real-world problems.
	01CH0406	CO1 :	Explain the basic mechanism of mass transfer including diffusion and convective mass transfer
	01CH0406	CO2 :	Solve the problems related to mass transfer coefficient and interphase mass transfer.
	01CH0406	CO3 :	Understand the gas-liquid contacting process and solve related problems
	01CH0406	CO4 :	Solve problems on gas absorption and design gas absorption column.
	01CH0406	CO5 :	Understand Drying and Crystallization operation.
	01CH0407	CO1 :	Understand principle of various modes of heat transfer with relation to existing energy system.
	01CH0407	CO2 :	Apply theoretical knowledge of governing equations to solve practical engineering problems.
	01CH0407	CO3 :	Analyze the various technological methods related to heat transfer for the benefits of the process plant.



	01CH0407	CO4 :	Evaluate the outcomes after reviewing the problems associated at preliminary stage of design of heat transfer equipment.
	01MA0281	CO0 :	-----
	01MA0281	CO1 :	Understand the basic concepts of probability and distribution to realize the logic of data sciences
	01MA0281	CO2 :	"Apply the concept of Data representation and Analysis in various field of engineering like image processing etc."
	01MA0281	CO3 :	"Apply concept of Correlation and Regression in result analysis and Business forecasting using EXCEL."
	01MA0281	CO4 :	Analyse errors for accuracy and precision of solutions to hike up the level of accuracy in daily calculations.
	01MA0281	CO5 :	"Apply curve fitting and interpolation techniques to approximate a function into any known curve to analyse their behaviours."
<b>5</b>	01CH0502	CO1 :	Relate the role of Cleaner Production in sustainable development in Chemical Industries.
	01CH0502	CO2 :	Appraise the Energy conservation via Cleaner Technology Options.
	01CH0502	CO3 :	Connect Cleaner Production & Cleaner Technology as Remedial Measures for Mitigating Climate Change
	01CH0502	CO4 :	Judge the Green Process options available for the conventional processes being followed in Chemical Industries.
	01CH0503	CO1 :	Basic understanding of the applications of fundamental principles of chemical engineering thermodynamics and its laws.
	01CH0503	CO2 :	Calculate various phase and reaction equilibrium.
	01CH0503	CO3 :	Estimate various thermodynamic properties, fugacity and activity coefficient
	01CH0503	CO4 :	Apply basic concepts of liquid solution properties
	01CH0504	CO1 :	Develop Mathematical model of Chemical Engineering System.
	01CH0504	CO2 :	Examine order of Chemical Engineering system and generate the transfer function of systems.
	01CH0504	CO3 :	Examine the feedback controller effect on the response of a chemical process.
	01CH0504	CO4 :	Analyze stability of the control system
	01CH0504	CO5 :	Understand working principles of basic instruments available for flow, pressure, level and temperature measurement.
	01CH0505	CO1 :	Analyze Indian and International Safety Standards
	01CH0505	CO2 :	Detect the cause of accident and explain various engineering control methods
	01CH0505	CO3 :	Demonstrate the understanding of storage, handling and transportation of hazardous materials
	01CH0505	CO4 :	Classify fire extinguishing agent methods
	01CH0507	CO1 :	Identify suitable mass transfer operation.
	01CH0507	CO2 :	Represent a suitable mass transfer operation for particular separation process.
	01CH0507	CO3 :	Determine the use and implication of different mass transfer processes with suitable number of stages and desired type.
	01CH0507	CO4 :	Estimate number of stages and height of packed column in distillation and extraction operation.
	01CH0507	CO5 :	Choose specific mass transfer operation in particular process.
	01CH0507	CO6 :	Design and modify various phenomenons of mass transfer operations using advanced techniques.
	01CH1506	CO1 :	Analyze the broad scope of roles played by Chemical engineers in the society.



	01CH1506	CO2 :	Recognize the main drivers for conducting projects in chemical engineering
	01CH1506	CO3 :	Evaluate how human variation impacts on chemical engineers and society
	01CH1506	CO4 :	apply some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real world problems.
	01CR0501	CO1 :	Contrast and understand short pieces of business correspondence reports or proposals. (Understanding)
	01CR0501	CO2 :	Read and Categorize the extracts from business publications. Ask for the information required. (Analyzing)
	01CR0501	CO3 :	Listen to, understand and contribute to discussions in meetings. (Remembering)
	01CR0501	CO4 :	Prepare the presentation on a familiar topic. (Applying)
<b>6</b>	01CH0602	CO1 :	To build basic knowledge and Understanding of classification of reactions.
	01CH0602	CO2 :	Understand kinetics of competing reactions and their influence on product yield and selectivity.
	01CH0602	CO3 :	Understand fundamentals of kinetics including definitions of rate and forms of rate expressions and relationships between moles, concentration, extent of reaction and conversion.
	01CH0602	CO4 :	Derive batch, CSTR, and PFR performance equations from general material balance.
	01CH0603	CO1 :	Analyze, compare process equipment's and modify the design of existing equipment to new process conditions or new required capacity.
	01CH0603	CO2 :	Build a bridge between theoretical and practical concepts used for designing the equipment in any process industry
	01CH0603	CO3 :	Explain use of equipment design.
	01CH0603	CO4 :	Identify the importance of design concepts in process industry.
	01CH0605	CO1 :	Understand the different roles of, and relations between, firms, governmental agencies, not-for-profit organisations and other actors in relation to issues concerning environmental and natural resource management and sustainability.
	01CH0605	CO2 :	Describe the motivating factors and processes for integrating environmental and natural resource management and sustainability issues with the strategies, operations management and global surveillance of organisations.
	01CH0605	CO3 :	Analyze results from own studies with results from other natural science and social science studies.
	01CH0605	CO4 :	Apply the principles and create a project and firmly establish the study in a theoretical basis within environmental management and sustainable development
	01CH0606	CO1 :	To judge the development of bio process technology design and construction of fermentor.
	01CH0606	CO2 :	To predict the various media for Fermentation Process.
	01CH0606	CO3 :	To analyse the principles and kinetics of Sterilization methods.
	01CH0606	CO4 :	To compare the batch, fed-batch and continuous systems.
	01CH0606	CO5 :	To evaluate different mass transfer operations used in biochemical industries
	01CH0608	CO1 :	Understand the concept of unit operations and unit processes
	01CH0608	CO2 :	Develop ability to read and abstract the process flow diagrams.
	01CH0608	CO3 :	Inspect different feed preparation, separation and purification steps involved





		in the manufacturing of organic and inorganic chemicals.
01CH0608	CO4 :	Analyse the salient features of the process.
01CH0609	CO1 :	Analyze the broad scope of roles played by Chemical engineers in the society.
01CH0609	CO2 :	Recognize the main drivers for conducting projects in chemical engineering
01CH0609	CO3 :	Evaluate how human variation impacts on chemical engineers and society
01CH0609	CO4 :	apply some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real world problems.
01ES0601	CO1 :	To understand the availability of various Renewable Energy Resources.
01ES0601	CO2 :	To understand how to harness these Energy Resources.
01ES0601	CO3 :	To apply the principles to extract energy out of the resources.
01ES0601	CO4 :	To analyze the concept of sustainable use of natural resources.
7		
01CH0701	CO1 :	Identify the suitable process modelling approach for various processes.
01CH0701	CO2 :	Construct the mathematical models for different processes.
01CH0701	CO3 :	Plan the appropriate modelling and simulation methodology for respective system.
01CH0701	CO4 :	Test and justify the developed model for a particular process.
01CH0701	CO5 :	Design and rearrange the parameters based on the modelling approach.
01CH0702	CO1 :	Analyze the residence time distribution studies for any flow reactor, to predict the deviation from ideal reactors by evaluating the dispersion number.
01CH0702	CO2 :	Analyze the various contacting pattern for two phase system and predict the rate equation for heterogeneous reactions.
01CH0702	CO3 :	Analyze the best kinetic regimes for mass transfer and reaction for a given reaction and predict the rate equation.
01CH0702	CO4 :	Predict the rate-controlling step for the fluid - particle reactions.
01CH0703	CO1 :	Analyze, compare process equipment's and modify the design of the existing equipment to the new process conditions or new required capacity.
01CH0703	CO2 :	Build a bridge between theoretical and practical concepts used for designing the equipment in any process industry.
01CH0703	CO3 :	Create understanding of equipment design with mechanical concepts.
01CH0703	CO4 :	Identify the use of design concepts and relevant application of equipment design in process industry.
01CH0704	CO1 :	Study the economic aspects of equipment selection
01CH0704	CO2 :	Understand the concept of capital investment and capital returns for chemical industry.
01CH0704	CO3 :	Apply the concepts to design a manufacturing plant.
01CH0704	CO4 :	Evaluate the profitability of process industry projects using different measures and analyse market potential for process industry products
01CH0705	CO1 :	Understand how a project has to be started, their pre-requirements, flowchart preparation, and economic calculation and solution.
01CH0705	CO2 :	Conduct experiments to solve complex engineering problems effectively as an individual or team work.
01CH0705	CO3 :	Perform as a leader with good ethical principles to meet societal needs in the field of chemical and allied engineering
01CH0705	CO4 :	Present the results from the work comprehensively through presentation
01CH0706	CO1 :	Understand general processing flow for various food products, physical principles of operation for various types of equipment.



01CH0706	CO2 :	Impact of the processing on the physical, chemical and sensory properties of the food products.
01CH0706	CO3 :	Compare results from own studies with results from other natural science and social science studies.
01CH0706	CO4 :	Select the food processing method most suitable for specific application
		After completion of this course, student will be able to: 1. apply modern separation techniques in various applications 2. analyze and evaluate novel membranes for intended application 3. analyze and design pervaporation, chromatography and dialysis based separation processes
01CH0707	CO0 :	4. utilize the technological methods in problem solving in process plant.
01CH0707	CO1 :	apply modern separation techniques in various applications
01CH0707	CO2 :	analyze and evaluate novel membranes for intended application
01CH0707	CO3 :	analyze and design pervaporation, chromatography and dialysis based separation processes
01CH0707	CO4 :	utilize the technological methods in problem solving in process plant.



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<b>3</b>		
01CH0301	CO1 :	To create a vision of understanding the momentum transfer process.
01CH0301	CO2 :	To analyze fluid flow concepts.
01CH0301	CO3 :	To review the practical importance and relevance of fluid flow in process industry.
01CH0301	CO4 :	To be able to utilize the technological methods in problem solving in process plant.
01CH0301	CO5 :	To build a bridge between theoretical and practical concepts used in industry.
01CH0301	CO6 :	To understand the behaviour of fluid phase operations going in an industry.
01CH0302	CO0 :	.
01CH0302	CO1 :	Establish mathematical methodologies for the computation of material balances and energy balances
01CH0302	CO2	Present an overview of industrial chemical processes



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01CH0302	CO3 :	Develop an in depth understanding of the basic principles of chemical engineering calculations
01CH0302	CO4 :	Solve material and energy balance problems.
01CH0302	CO5 :	Evaluate their own solutions and those of others to find and correct errors.
01CH0303	CO1 :	To build basic knowledge of various mechanical operations.
01CH0303	CO2 :	To review the practical importance and relevance of unit operations used for crushing, grinding and size separation in chemical industry.
01CH0303	CO3 :	To utilize the technological methods related to unit operations in process plant.
01CH0303	CO4 :	To study a detailed overview of equipment used to perform various mechanical operations and problems associated during the implementation and applications.
01CH0305	CO1 :	Analyze the broad scope of roles played by Chemical Engineering in the society.
01CH0305	CO2 :	Recognize the main drivers for conducting projects in chemical engineering.
01CH0305	CO3 :	Evaluate how human variation impacts on chemical engineers and society.
01CH0305	CO4 :	Applying some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real-world problems.
01CH0306	CO1 :	Compare the classical and modern analytical techniques
01CH0306	CO2 :	Point out the various applications of electrochemistry, fuels, analytical techniques and environmental chemistry
01CH0306	CO3 :	Estimate the combustion parameters, instrumental methods and possible solutions to environmental issues
01CH0306	CO4 :	Analyze the various problems and solutions related to fuels, pollutions and analysis
01CH0306	CO5 :	Predict the various instrumental methods of analysis.
01CR0302	CO1 :	Express the basics of human values.
01CR0302	CO2 :	Articulate human values and grow as responsible human beings in the society
01CR0302	CO3 :	Develop ethical conduct and deliver their professional duties.
01CR0302	CO4 :	Analyze ethical confusions and contradictions to bring harmony at thought, behaviour and action level
01MA0301	CO1 :	Expand Various functions in terms of sine and cosine functions
01MA0301	CO2 :	Classify and apply the standard methods to solve ordinary and partial differential equations
01MA0301	CO3 :	Apply Laplace transform & series solution to solve differential equations.
01MA0301	CO4 :	Apply the knowledge of differential equations and its solutions to evaluate engineering problems



4	01CH0401	CO1 :	Apply basic principles of thermodynamics in engineering
	01CH0401	CO2 :	Create mathematical models for the calculation of heat and work association for any process changes
	01CH0401	CO3 :	Calculate properties of pure compounds using different models of equations of state and other mathematical models
	01CH0401	CO4 :	Understand the interaction of heat during the process (chemical or physical) and able to apply appropriate model to calculate the energy requirement of any process
	01CH0401	CO5 :	Understanding of the fundamental principles of chemical engineering thermodynamics and its laws.
	01CH0402	CO1 :	To build basic knowledge and understand the concepts of the material composition.
	01CH0402	CO2 :	To evaluate the practical importance and relevance of properties of materials and its application in chemical industry.
	01CH0402	CO3 :	To analyze the technological methods related to material strength
	01CH0402	CO4 :	To discover the reasons for existence of various material properties
	01CH0402	CO5 :	To create a bridge between theoretical and practical concept used in industry.
	01CH0405	CO1 :	Analyze the broad scope of roles played by Chemical Engineering in the society.
	01CH0405	CO2 :	Recognize the main drivers for conducting projects in chemical engineering.
	01CH0405	CO3 :	Evaluate how human variation impacts on chemical engineers and society.
	01CH0405	CO4 :	Applying some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real-world problems.
	01CH0406	CO1 :	Explain the basic mechanism of mass transfer including diffusion and convective mass transfer
	01CH0406	CO2 :	Solve the problems related to mass transfer coefficient and interphase mass transfer.
	01CH0406	CO3 :	Understand the gas-liquid contacting process and solve related problems
	01CH0406	CO4 :	Solve problems on gas absorption and design gas absorption column.
	01CH0406	CO5 :	Understand Drying and Crystallization operation.
	01CH0407	CO1 :	Understand principle of various modes of heat transfer with relation to existing energy system.
	01CH0407	CO2 :	Apply theoretical knowledge of governing equations to solve practical engineering problems.
	01CH0407	CO3 :	Analyze the various technological methods related to heat transfer for the benefits of the process plant.
	01CH0407	CO4 :	Evaluate the outcomes after reviewing the problems associated at preliminary stage of design of heat transfer equipment.
	01MA0281	CO0 :	-----
	01MA0281	CO1 :	Understand the basic concepts of probability and distribution to realize the logic of data sciences





	01MA0281	CO2 :	"Apply the concept of Data representation and Analysis in various field of engineering like image processing etc."
	01MA0281	CO3 :	"Apply concept of Correlation and Regression in result analysis and Business forecasting using EXCEL."
	01MA0281	CO4 :	Analyse errors for accuracy and precision of solutions to hike up the level of accuracy in daily calculations.
	01MA0281	CO5 :	"Apply curve fitting and interpolation techniques to approximate a function into any known curve to analyse their behaviours."
<b>5</b>	01CH0502	CO1 :	Relate the role of Cleaner Production in sustainable development in Chemical Industries.
	01CH0502	CO2 :	Appraise the Energy conservation via Cleaner Technology Options.
	01CH0502	CO3 :	Connect Cleaner Production & Cleaner Technology as Remedial Measures for Mitigating Climate Change
	01CH0502	CO4 :	Judge the Green Process options available for the conventional processes being followed in Chemical Industries.
	01CH0503	CO1 :	Basic understanding of the applications of fundamental principles of chemical engineering thermodynamics and its laws.
	01CH0503	CO2 :	Calculate various phase and reaction equilibrium.
	01CH0503	CO3 :	Estimate various thermodynamic properties, fugacity and activity coefficient
	01CH0503	CO4 :	Apply basic concepts of liquid solution properties
	01CH0504	CO1 :	Develop Mathematical model of Chemical Engineering System.
	01CH0504	CO2 :	Examine order of Chemical Engineering system and generate the transfer function of systems.
	01CH0504	CO3 :	Examine the feedback controller effect on the response of a chemical process.
	01CH0504	CO4 :	Analyze stability of the control system
	01CH0504	CO5 :	Understand working principles of basic instruments available for flow, pressure, level and temperature measurement.
	01CH0505	CO1 :	Analyze Indian and International Safety Standards
	01CH0505	CO2 :	Detect the cause of accident and explain various engineering control methods
	01CH0505	CO3 :	Demonstrate the understanding of storage, handling and transportation of hazardous materials
	01CH0505	CO4 :	Classify fire extinguishing agent methods
	01CH0507	CO1 :	Identify suitable mass transfer operation.
	01CH0507	CO2 :	Represent a suitable mass transfer operation for particular separation process.
	01CH0507	CO3 :	Determine the use and implication of different mass transfer processes with suitable number of stages and desired type.
	01CH0507	CO4 :	Estimate number of stages and height of packed column in distillation and extraction operation.
	01CH0507	CO5	Choose specific mass transfer operation in particular process.



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01CH0507	CO6 :	Design and modify various phenomenons of mass transfer operations using advanced techniques.
01CH1506	CO1 :	Analyze the broad scope of roles played by Chemical engineers in the society.
01CH1506	CO2 :	Recognize the main drivers for conducting projects in chemical engineering
01CH1506	CO3 :	Evaluate how human variation impacts on chemical engineers and society
01CH1506	CO4 :	apply some basic concepts and methods from chemical engineering to explore creative solutions to clearly defined real world problems.
01CR0501	CO1 :	Contrast and understand short pieces of business correspondence reports or proposals. (Understanding)
01CR0501	CO2 :	Read and Categorize the extracts from business publications. Ask for the information required. (Analyzing)
01CR0501	CO3 :	Listen to, understand and contribute to discussions in meetings. (Remembering)
01CR0501	CO4 :	Prepare the presentation on a familiar topic. (Applying)



**Marwadi**  
University

**Bachelor of Technology**

**Department of Chemical Engineering**

**Course Outcome**

**Batch**

**(2021-22)**

**B.Tech. in Chemical Engineering**



Sem	Subject Code	Sr No	Course Out Comes
1	01CH0101	CO1 :	Explain the basic concepts of organic chemistry and recent trends in Green Chemistry.
	01CH0101	CO2 :	Demonstrate the knowledge of fundamentals of water technology and identify the various water treatment methods.
	01CH0101	CO3 :	Understand chemistry behind corrosion and identify the various types of corrosion and its effect.
	01CH0101	CO4 :	Identify as well as classify the properties of various types of cement, Refractory, Abrasives and Insulators, Polymers etc.
	01CI1101	CO1 :	Recognize importance of civil engineering and its day to day applications
	01CI1101	CO2 :	Interpret the plan/map; locate the objects on ground from map and from site to on paper plan/map.
	01CI1101	CO3 :	Describe qualitative comparison between different materials and its selection.
	01CI1101	CO4 :	Create & interpret building planning and will be able to draw plan, section and elevation.
	01CI1101	CO5 :	Acquaint with the various modes of transportation.
	01EN1101	CO1 :	Understand and realize the multidisciplinary nature of Environment and its components.
	01EN1101	CO2 :	Know the importance of natural resources for the sustainable development of life.
	01EN1101	CO3 :	Understand the effect of growing population on the Environment.
	01EN1101	CO4 :	Classify the different types of pollution and measure to control pollution
	01EN1101	CO5 :	Learn about the Environmental issues faced globally and various steps taken globally to solve such Environmental issues.
	01MA2101	CO1 :	Expand functions using Maclaurin's and Taylor's series.
	01MA2101	CO2 :	Apply and solve first order differential equations to real life problems
	01MA2101	CO3 :	Verify Euler's theorem and Modified Euler's theorem for given function of several variables.
	01MA2101	CO4 :	Apply Multiple Integral to evaluate the Surface Area and Volume of any 3D objects.
	01MA2101	CO5 :	Apply the concepts of convergence and divergence of infinite series in problem of science, technology and engineering.
	01MA2101	CO6 :	Apply the method of Lagrange's multiplier to solve the problems of constrained optimization.
	01ME1101	CO1 :	To understand the basic terminology of Mechanical systems.
	01ME1101	CO2 :	To able to make elementary calculations of ideal gases and steam.
	01ME1101	CO3 :	To understand working and construction of different boilers and mountings and accessories.
	01ME1101	CO4 :	To analyze the performance of I.C. engines.
	01ME1101	CO5 :	To understand working and construction of pump and various refrigeration cycles.
	01ME1101	CO6 :	To understand various power transmission elements.
	01SL0102	CO1 :	To enhance reading skills for academic purposes
	01SL0102	CO2 :	To evolve appropriate writing competence for academic purposes
	01SL0102	CO3 :	To carry out reading and writing tasks in the context of technology and



		technology related content
	01SL0102	CO4 : To express their ideas in formal, academic written form
	01SL0103	CO1 : Develop speaking competence for academic purpose
	01SL0103	CO2 : Speak on a given topic in the context of technology
	01SL0103	CO3 : Express ideas in an organized way for conversations and interactions related to academic requirements
	01SL0103	CO4 : Enhance the ability to make a presentation on a given topic
<b>2</b>	01CE1101	CO1 : Able to explain programming problems logically through flow charts and algorithms.
	01CE1101	CO2 : Identify programming principles using C Language.
	01CE1101	CO3 : Demonstrate problem solving skills through C Language.
	01CE1101	CO4 : Generate computer-based solution for real time problem using programming language.
	01CE1101	CO5 : Develop confidence to self-educate new programming languages.
	01EE1101	CO1 : Analyze electrical circuits with different elements
	01EE1101	CO2 : Apply principle of electromagnetic for electromechanical energy conversion in machines
	01EE1101	CO3 : Choose a semiconductor circuit based on a given application.
	01EE1101	CO4 : Describe the operation of various OpAmp circuits.
	01EE1101	CO5 : Define the role of electrical apparatus used in household applications
	01MA0103	CO1 : Apply vectors in higher dimensional space in experimental data, graphical images, civil and mechanical systems.
	01MA0103	CO2 : apply System of linear equations in solving the problems of electrical and mechanical engineering, applied mechanics etc.
	01MA0103	CO3 : Apply the concept of Eigen values and vectors in various field of engineering like control theory, vibration analysis, quantum mechanics etc.
	01MA0103	CO4 : Understand the key role of vector integral calculus in finding flux in vector field, finding potential function, etc.
	01ME1102	CO1 : Know, understand and able to define the methods of engineering drawing
	01ME1102	CO2 : Learn basic sketching methods
	01ME1102	CO3 : Understand engineering drawings using fundamental mathematics
	01ME1102	CO4 : Construct Engineered Drawing
	01ME1102	CO5 : Develop visualization skills so that they can create new product design
	01ME1102	CO6 : Understand the theory of projection, Learn technical communication skill

# **COURSE OUTCOME**

**FACULTY OF COMPUTER APPLICATION**

**Course Outcomes (COs)**

<b>Course Component</b>	<b>Semester</b>	<b>Course Name with Course Code</b>	<b>Course Outcomes</b>
Core	1	FoM_05BC1101	1. Able to apply concepts of set theory in problem solving 2. Enhance the students ability to think logically and mathematically 3. Able to apply concepts of matrix in real life problem. 4. Able to specify and manipulate basic mathematical objects such as relations and functions and their properties. 5. Able to understand and apply fundamentals of graph theory in solving problems.
Core	1	COA_05BC1102	1. Outline the organization of a computer system in terms of its main components. 2. Understand the digital representation of data and differentiate between number systems and codes. 3. Describe laws of Boolean Algebra and their usage and understand functions of logic gates. 4. Understand the concept of sequential logic and combinational circuit. 5. Understand the concept of system memory hierarchy.
Core	1	PIC1_05BC1103	1. Ability to develop understanding of Procedure Oriented Programming Language 2. Ability to illustrate the flowchart and design algorithm for a given problem 3. Ability to use conditional and iterative statements. 4. Ability to develop user defined functions for the different applications. 5. Ability to use pre-processor directives for the file inclusion and macro substitutions.
Core	1	HTML_05BC1104	1. Students will be able to design dynamic website. 2. Students will be able to apply different HTML5 tags to develop user friendly web-site. 3. Students will be able to apply CSS to make

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**Bachelor of Computer Applications**

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			<p>website presentable.</p> <p>4. Students will be able to develop website using multimedia tags like audio and video.</p> <p>5. Students will be able to design and develop dynamic website using JavaScript.</p>
Core	2	CONM_05BC1201	<p>1. Able to apply different type of errors rules occurring in numerical calculation &amp; solution of them.</p> <p>2. Ability to apply of numerical iterative methods for the basic problems of numerical analysis.</p> <p>3. Able to apply algorithmic implementation of different interpolation methods.</p> <p>4. Application of concept of differentiation, integration in numerical calculation.</p> <p>5. Able to understand and apply the application and solution of linear differential equations &amp; predictor –corrector methods.</p>
Core	2	SAD_05BC1202	<p>1. Knowledge of steps in Software Development</p> <p>2. Application of Information gathering methods.</p> <p>3. Depiction of Analysis in terms of diagrams and tables.</p> <p>4. Creating effective User Interface Design.</p> <p>5. Ensuring Quality Assurance and effective implementation of system.</p>
Core	2	PIC2_05BC1203	<p>1. Ability to work with arrays of complex objects.</p> <p>2. Ability to work with textual information, characters and strings.</p> <p>3. Ability to develop advanced applications using enumerated data types, function pointers and nested structures.</p> <p>4. Ability to implement programs with pointers and arrays, perform pointer arithmetic, and use the dynamic memory allocation.</p> <p>5. Ability to work with basics of file handling mechanism that is essential for understanding the concepts in database management systems.</p> <p>6. Ability to find out better searching and sorting techniques for list of data.</p>
Core	2	DBMS_05BC1204	<p>1. To understand various fundamental aspects</p>



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			<p>of database management system.</p> <ol style="list-style-type: none"> <li>To depict a database system using ER diagram.</li> <li>To understand the uses the database schema and need for normalization.</li> <li>To implement and execute SQL Queries.</li> <li>Query representation using Relational Algebra.</li> </ol>
Core	3	BS_05BC1301	<ol style="list-style-type: none"> <li>To compute descriptive statistics including diagrammatic representation and interpretation</li> <li>To calculate probability and classify the probability usage in different area.</li> <li>To test sampling characteristic from a population based on statistical measures &amp; construct a sample for experiment.</li> <li>To verify decision statements by parametric methods.</li> <li>To determine simple linear regression analysis and correlation to understand time series analysis and application to predict value of unknown variable.</li> </ol>
Core	3	DBMS2_05BC1302	<ol style="list-style-type: none"> <li>Student will be able to understand the various concept of PL/SQL.</li> <li>Student will be able to manage implicit and explicit cursors.</li> <li>Student will be able to trace and correct the errors by using the concepts of exception handling.</li> <li>Student will be able to manage database objects like stored procedures and functions.</li> <li>Students will develop an ability to create and implement database triggers.</li> </ol>
Core	3	DS_05BC1303	<ol style="list-style-type: none"> <li>Compare different data structures. Pick an appropriate data structure for a design situation.</li> <li>Use appropriate data structures like arrays, linked list, stacks and queues to solve real world problems efficiently.</li> <li>Represent and manipulate data using nonlinear data structures like trees and graphs to design algorithms for various applications.</li> <li>Implement operations like searching, insertion, and deletion, traversing mechanism etc. on various data structures.</li> <li>Determine and analyze the complexity of</li> </ol>

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			given Algorithms.
Core	3	JAVA_05BC1304	<ol style="list-style-type: none"> <li>1. Describe the basic concepts of OOP with Java.</li> <li>2. Construct console based applications using various features of java.</li> <li>3. Determine how to use Exception handling in Java .</li> <li>4. Determine how to use Multithreading in Java.</li> <li>5. Construct Applications based on Database Connectivity.</li> </ol>
Core	4	OOAD_05BC1401	<ol style="list-style-type: none"> <li>1. Ability to discriminate what the UML is, what it is not, and why the UML is relevant to the process of developing software-intensive systems.</li> <li>2. Ability to apply rules, idioms and vocabulary of the UML.</li> <li>3. Ability to use UML effectively in software development process.</li> <li>4. Ability to prepare structural, behavioural and architectural model of a software</li> <li>5. Ability to apply the UML to solve common modelling problems.</li> </ol>
Core	4	OS_05BC1402	<ol style="list-style-type: none"> <li>1. Demonstrate understanding of the concepts, structure and design of operating Systems.</li> <li>2. Demonstrate understanding of operating system design and its impact on application system design and performance.</li> <li>3. Able to apply different solutions for Memory Partitioning.</li> <li>4. Understand about interactions between user application, hardware and OS.</li> <li>5. Design program in Unix for file and directory management.</li> </ol>
Core	4	CN_05BC1403	<ol style="list-style-type: none"> <li>1. Explain basics of Computer Networks and functionality of each layer of OSI and TCP/IP models.</li> <li>2. Compare difference between OSI and TCP/IP model.</li> <li>3. Apply error-detection and error-correction techniques to provide better security</li> <li>4. Apply insight of programming for network solutions.</li> <li>5. Compare different protocols for data</li> </ol>

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			transmission.
Secondary	4	BCT_05BC1404	<ol style="list-style-type: none"> <li>1. To apply their speaking skills in business communication.</li> <li>2. To create effective technical presentations.</li> <li>3. To create various written documents for business and technology.</li> <li>4. To apply English language skills for professional purposes.</li> </ol>
Core	5	MIS_05BC1501	<ol style="list-style-type: none"> <li>1. Students will be able to understand about organizations, management and role of Information Systems</li> <li>2. Students can distinguish between the concept of Ethical and Social Issues in Information Systems &amp; DBMS</li> <li>3. Students will be able to apply and relate Knowledge Management and Decision Making Process</li> <li>4. Students will be able to analyze Enterprise applications and concepts of Business Intelligence (BI).</li> <li>5. Students will be able to gain the knowledge about how to secure Information Systems</li> </ol>
Core	5	Software Testing_05BC1502	<ol style="list-style-type: none"> <li>1. Student will be able to understand the difference between bugs, errors and faults and build basic test cases.</li> <li>2. Student will be able to apply testing techniques.</li> <li>3. Student will be able to compare various levels of testing.</li> <li>4. Student will be able to prepare test plans, design and various test reports.</li> <li>5. Student will be able to understand software quality and its various models.</li> </ol>
Elective – I	5	Data Analytics with R_05BC1503	<ol style="list-style-type: none"> <li>1. To understand Data analytics, its types and its applications.</li> <li>2. To get knowledge about R studio installation and R programming fundamental concepts like variable, data types, commands.</li> <li>3. To apply the basics in R programming in terms of functions, loops, decision making and data structure.</li> <li>4. To design various experiments based on graphs and charts for data visualization in R programming.</li> </ol>

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			5. To apply of statistical computations for data analytics.
Elective – I	5	Web Application Development – 1_05BC1504	<ol style="list-style-type: none"> <li>1. Students will be able to apply the Apache Web Server configuration and PHP Program Structure.</li> <li>2. Students will be able to understand the concept of Web Application Design and development.</li> <li>3. Students will be able to develop web application using open source technologies like PHP &amp; MySQL.</li> <li>4. Students will be able to apply PHP scripting language and deploying web application on Apache Web Server.</li> <li>5. Students will be able to design and develop dynamic website using JavaScript.</li> </ol>
Elective – II	5	Computer Graphics_05BC1505	<ol style="list-style-type: none"> <li>1. Understand and implement graphics terms and concepts.</li> <li>2. Apply the 2D graphics operations into the objects.</li> <li>3. Apply the 3D graphics concepts and its transformation methods.</li> <li>4. Analyze the appropriate data structures required for the graphical displays.</li> <li>5. Applications of Virtual Reality models and recent trends.</li> </ol>
Elective – II	5	Android Programming_05BC1506	<ol style="list-style-type: none"> <li>1. Describe mobile development and basics of android.</li> <li>2. Design UI and develop Fragment for Android App.</li> <li>3. Develop an Android App using multimedia, menus, animation and background threads.</li> <li>4. Build their ability to develop Database Application by applying the concepts of SQLite and Content Providers.</li> <li>5. Demonstrate how to publish Android App on Google Play store.</li> </ol>
Core	6	Cloud Computing Foundation_05BC1601	<ol style="list-style-type: none"> <li>1. To explain the core concepts of the cloud computing paradigm how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing .</li> <li>2. To discuss system virtualization and outline its role in enabling the cloud computing</li> </ol>

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			<p>system model.</p> <ol style="list-style-type: none"> <li>Analyze the performance of Cloud Computing.</li> <li>Understand the concept of Cloud Security.</li> <li>Learn the Concept of Cloud Infrastructure Model</li> </ol>
Core	6	CyberSecurity_05BC1602	<ol style="list-style-type: none"> <li>Analyze the cyber perimeter of the infrastructures against cyber-attacks.</li> <li>Analyze threats and risks within context of the cyber security architecture.</li> <li>Examine the performance and troubleshoot Network and Cyber security systems.</li> <li>Implement different tools which are utilized for the exploitation of the cyber security.</li> <li>Evaluate cyber activities which are considered as crime as per IT Act.</li> </ol>
Elective - I	6	Python Programming_05BC1603	<ol style="list-style-type: none"> <li>Describe basics of Python Programming.</li> <li>Design a Python Program using Functions &amp; Modules.</li> <li>Develop understanding of Exceptions and File Handling in Python.</li> <li>Build their ability to develop Python Programs using Object-Oriented concepts.</li> <li>Create robust applications using Python Programming</li> </ol>
Elective - I	6	LARAVEL_05BC1604	<ol style="list-style-type: none"> <li>Students will understand LARAVEL framework structure.</li> <li>Students will understand importance of Template Inheritance Implementation in web application.</li> <li>Students will design in-built Validations in Laravel application.</li> <li>Student will develop LARAVEL Application using Database CRUD operation.</li> <li>Students will design MVC framework architecture through Laravel.</li> </ol>
Elective - II	6	IP_05BC1605	<ol style="list-style-type: none"> <li>Students will be able to Understand image representation &amp; Enhance image quality using image processing.</li> <li>Students will be able to understand Intensity transformation and Histogram processing to analyze image structure.</li> <li>Students will be able to apply filter on given image using frequency domain filtering technique</li> </ol>

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			<p>4. Students will be able to identify the proper image restoration technique to remove degradation from given image.</p> <p>5. Students will be understood and representation of color image processing with various models.</p>
Elective – II	6	GAD_05BC1606	<p>1. Illustrate an understanding of the language and concepts of game development technology and techniques.</p> <p>2. Design and develop game scripts using C# and the Unity API.</p> <p>3. Demonstrate knowledge of the various interface components that compromise the Integrated Development Environment (IDE) of Unity.</p> <p>4. Apply mathematical and game programming knowledge and skills to solve development tasks.</p> <p>5. Understand and apply Object-Oriented Programming techniques in C#.</p>
Core	7	Advanced Networking_05BC0701	<p>1. Understand IP addressing and Mapping methodologies.</p> <p>2. Evaluate a strong conceptual foundation of the TCP/IP protocol stack, services and related tools/technologies.</p> <p>3. Implement different routing methodologies for configuring routers for better performance.</p> <p>4. Analysis of all the commonly used protocols used in the TCP/IP protocol stack.</p> <p>5. Evaluate testing and troubleshooting of different network-based protocol and services.</p>
Core	7	ML_05BC0702	<p>1. Able to understand applications of ML in real life.</p> <p>2. Able to implement preprocessing steps on data to make it ready for analysis.</p> <p>3. Able to apply classification algorithms for supervised learning</p> <p>4. Able to apply regression algorithms for predictive analysis.</p> <p>5. Able to apply clustering algorithms and association rule mining algorithms for real life problems.</p>
Core	7	LARAVEL_05BC0703	<p>1. Students will understand LARAVEL</p>



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			<p>framework structure.</p> <ol style="list-style-type: none"><li>2. Students will understand importance of Template Inheritance Implementation in web application.</li><li>3. Students will design in-built Validations in Laravel application.</li><li>4. Student will develop LARAVEL Application using Database CRUD operation.</li><li>5. Students will design MVC framework architecture through Laravel.</li></ol>
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**COURSE OUTCOME**

**FACULTY OF SCIENCE**



## **DEPARTMENT OF MICROBIOLOGY**

### **UNDERGRADUATE PROGRAM- BSc. Microbiology**

#### **Program Outcomes (POs)**

Sr. No.	Program Outcome Statement
<b>PO1</b>	Prepare the graduates who have a thorough knowledge of the fundamental aspects of science and an awareness of its applications.
<b>PO2</b>	To understand and acquire knowledge of Basic science relevant to the discipline.
<b>PO3</b>	To utilise appropriate key skills and tools for solving scientific problems.
<b>PO4</b>	To understand professional, ethical and social issues and responsibilities for the scientific community.
<b>PO5</b>	To apply the design and development principles in the construction of scientific systems of varying complexity.
<b>PO6</b>	To categorize the graduates with skills sets for job opportunities in Research organisations, Private and Government jobs and further academic study
<b>PO7</b>	To prepare the graduates with efficiency to independently initiate starts ups/entrepreneurship ventures.
<b>PO8</b>	To Prepare/nurture graduates with holistic approach towards identification and development of solution to scientific challenges.
<b>PO9</b>	To prepare graduates who will work and communicate effectively in inter-disciplinary environment

#### **Program specific Outcomes (PSOs)**

Sr. No.	Program Specific Outcomes Statement
<b>PSO1</b>	Students will acquire fundamental and advanced understanding of the Life science and allied subjects.
<b>PSO2</b>	Students will comprehend the understanding of biologically relevant technical skills.

## Course Outcomes (COs)

On completion of the course students will be able to

COURSE COMPONENT	COURSE	COURSE OUTCOME
<b>CORE I</b>	<b>INTRODUCTION TO MICROBIOLOGY</b>	<p><b>CO1:</b> Acquire, articulate and recall history and scientific theories relevant to Microbiology.</p> <p><b>CO2:</b> Understands the Classification of different types of microorganism.</p> <p><b>CO3:</b> To study diversity of different microbial groups.</p> <p><b>CO4:</b> To study application of microbiology in various fields.</p>
<b>CORE II</b>	<b>BASIC TECHNIQUES IN MICROBIOLOGY</b>	<p><b>CO1:</b> Understand principles and different methods of sterilisation.</p> <p><b>CO2:</b> Identify and understand use of different microscopy techniques.</p> <p><b>CO3:</b> Understanding of basic structure, similarities and differences among various groups of microorganisms using different staining methods.</p> <p><b>CO4:</b> Usage of various culture media and their applications.</p>
<b>CORE III</b>	<b>FUNDAMENTAL BIOLOGY –I</b>	<p><b>CO1:</b> Identify, recognize, list and label the biological organism in nature.</p> <p><b>CO2:</b> Understand and describe the structure, composition &amp; properties of plants and animal systems.</p> <p><b>CO3:</b> Predict an outcome using several pieces of information or concepts; and apply the information in a new context.</p> <p><b>CO4:</b> Infer and understand the structure, morphology and genetic components of organism and related it to the process as a whole.</p>
<b>CORE IV</b>	<b>CHEMISTRY-I</b>	<p><b>CO1:</b> Understand the basic idea of atomic structure and its quantum mechanical concept.</p> <p><b>CO2:</b> Be aware of the basic concepts of various types of chemical bonding.</p> <p><b>CO3:</b> Obtain the basic idea of thermodynamics and analyse simple systems involving energy</p>

		<p>balance by applying the concept of thermodynamics.</p> <p><b>CO4:</b> Get the idea of various thermochemical processes and their applications.</p> <p><b>CO5:</b> Recognize the basic involvement of electronic configuration and their consequences on formation of orbital's.</p>
<b>ELECTIVE I</b>	<b>READING AND WRITING FOR SCIENCE</b>	<p><b>CO1:</b> To understand the usage of language in terms of reading and writing for science;</p> <p><b>CO2:</b> To analyze and understand the language in context of science.</p>
<b>ELECTIVE II</b>	<b>SPEAKING AND PRESENTATION SKILLS</b>	<p><b>CO1:</b> To share information on familiar matters/issues in English;</p> <p><b>CO2:</b> To make effective presentations in English;</p> <p><b>CO3:</b> To gain confidence in speaking in English.</p>
<b>CORE V</b>	<b>BIOMOLECULES</b>	<p><b>CO1:</b> Understand the concepts &amp; properties of molecules and their reactions.</p> <p><b>CO2:</b> Better understanding about the structure, composition &amp; properties of various biomolecules like carbohydrate, nucleic acids lipids, proteins and vitamins etc.</p> <p><b>CO3:</b> Better understanding about the biological roles of biomolecules.</p> <p><b>CO4:</b> Developing concepts about biological functions &amp; applications of biomolecules in various fields.</p>
<b>CORE VI</b>	<b>CELL BIOLOGY</b>	<p><b>CO1:</b> Distinguish between Prokaryotic and Eukaryotic organization.</p> <p><b>CO2:</b> Distinguish between Plant and Animal cells.</p> <p><b>CO3:</b> Understand the structures and functions of various cellular organelles and its importance.</p> <p><b>CO4:</b> Explain the cell division and cell cycle regulation</p>
<b>CORE VII</b>	<b>FUNDAMENTAL BIOLOGY –II</b>	<p><b>CO1:</b> Identify, recognize and define a variety of terms specific to the plant and animals biology (anatomy, physiology, growth, development and pathogenesis).</p>

		<p><b>CO2:</b> Understand and describe the structure, growth and development of plants and animal systems.</p> <p><b>CO3:</b> Predict an outcome using several pieces of information; and apply the information in scientific manner pertaining to provide solution towards animal and plant pathological problems.</p> <p><b>CO4:</b> Acquire, understand and infer the ability to articulate the pathological processes to the pathogenesis of common plant and animal diseases.</p>
<b>CORE VIII</b>	<b>CHEMISTRY-II</b>	<p><b>CO1:</b> Understand the basic idea of Water analysis and Adsorption.</p> <p><b>CO2:</b> Be aware for the classification of elements and periodicity in property.</p> <p><b>CO3:</b> Capable to explain division of s, p, d and f blocks and their electronic configuration.</p> <p><b>CO4:</b> Obtain the basic idea of second law of Thermodynamics.</p> <p><b>CO5:</b> Get the idea of various thermochemical processes and their applications.</p> <p><b>CO6:</b> Get practical aspects of Water analysis.</p>
<b>CORE IX</b>	<b>PROFESSIONAL ETHICS</b>	<p><b>CO1:</b> Understand the basics of human values</p> <p><b>CO2:</b> Inculcate human values to grow as responsible human beings with proper personality</p> <p><b>CO3:</b> Maintain ethical conduct and discharge their professional duties</p> <p><b>CO4:</b> Resolve ethical confusions and contradictions and bring harmony at thought, behaviour and action level.</p>
<b>ELECTIVE III</b>	<b>ENGLISH THROUGH FICTION</b>	<p><b>CO1:</b> To comprehend English used in Science-Fiction</p> <p><b>CO2:</b> To use vocabulary of Science-Fiction adequately</p> <p><b>CO3:</b> To narrate and describe incident, event or experience confidently in English</p>
<b>ELECTIVE IV</b>	<b>ENGLISH THROUGH MOVIES</b>	<p><b>CO1:</b> Further enhance their basic language skills.</p>

		<p><b>CO2:</b> Identify and use different language functions in an audio-visual context;</p> <p><b>CO3:</b> Learn to use film and its elements as tools for language learning.</p>
<b>CORE X</b>	<b>MICROBIAL PHYSIOLOGY</b>	<p><b>CO1:</b> To study the classification of microorganisms according to their nutrition.</p> <p><b>CO2:</b> Understand the methods of pure cultures, cultural characteristics and preservation.</p> <p><b>CO3:</b> Apply their knowledge to differentiate type of growth requirement for specific microbial culture.</p> <p><b>CO4:</b> To study the autotrophic and heterotrophic metabolism.</p>
<b>CORE XI</b>	<b>MICROBIAL BIOCHEMISTRY</b>	<p><b>CO1:</b> Understand Enzymes along with its structure, function, mechanism, kinetics and regulation.</p> <p><b>CO2:</b> Understand the mechanism of transport of ions and small molecules across cell membranes.</p> <p><b>CO3:</b> Understand the complete oxidation from Glucose along with other associated pathways and regulation.</p> <p><b>CO4:</b> Understand amino acid metabolism and its regulation.</p>
<b>CORE XII</b>	<b>CAREER READINESS PROGRAM</b>	<p><b>CO1:</b> Appreciate English as their second Language and use the same in formal as well as in informal settings effectively.</p> <p><b>CO2:</b> Will be alert while using English as their second language in terms of; Pronunciation, using different word class, using appropriate verb form, Using appropriate conjunction for the given situations, etc.</p> <p><b>CO3:</b> Practice grammatical structures in short conversations and group discussions or classroom discussions</p> <p><b>CO4:</b> Understand the importance of personal and professional goals or benchmarks and create one for them.</p> <p><b>CO5:</b> Students shall reflect on Self Analysis or realization as the key to mastering any</p>

		discipline Students shall also value the impact of attitude in personal success.
<b>CORE XIII</b>	<b>CHEMISTRY-III</b>	<p><b>CO1:</b> Understand the behaviour and the involvement of the elements from periodic table while knowing the general chemistry.</p> <p><b>CO2:</b> Be aware of the basics of cycloalkanes; their methods of preparation, properties and stability.</p> <p><b>CO3:</b> Obtain the information regarding ‘s’ and ‘p’ block elements and their applications.</p> <p><b>CO4:</b> Understand the basic of hydrolysis, Ionic solids and there various studies.</p>
<b>CORE XIV</b>	<b>ENVIRONMENTAL STUDIES</b>	<p><b>CO1:</b> Recognize the structure, composition and interrelationship of environment with humans and non-human communities that shape this planet.</p> <p><b>CO2:</b> Understand types and importance of natural resources and Identify problems arise due to destruction of forest, over-use of energy resources.</p> <p><b>CO3:</b> Understand the structural aspects of ecosystems, types of biodiversity and its conservation.</p> <p><b>CO4:</b> To study types, causes, effects and control measures of environmental pollution.</p>
<b>CORE XV</b>	<b>ENGLISH THROUGH NON-FICTION</b>	<p><b>CO1:</b> To develop listening skills and answer comprehensive questions by applying the knowledge gained from the text;</p> <p><b>CO2:</b> To acquaint them with appropriate vocabulary and using the same vocabulary in different contexts;</p> <p><b>CO3:</b> To develop reading skills, by means of reading of different forms text relevant to non-fiction;</p> <p><b>CO4:</b> To develop writing skills focusing on the usage of language in the non-fictional text;</p> <p><b>CO5:</b> To construct a wide variety of sentences appropriate for non-fiction texts.</p>
<b>CORE XVI</b>	<b>BACTERIAL SYSTEMATICS</b>	<p><b>CO1:</b> Understand the importance of Microbial Evolution, Taxonomy, and Diversity.</p>

		<p><b>CO2:</b> Understand the basic and fundamental aspects of Archaea, Deinococci, Non-Proteobacteria and Proteobacteria along with its ecological role and importance.</p> <p><b>CO3:</b> Understand the basic and fundamental aspects of the low G + C and high G + C gram positives along with its ecological role and importance.</p> <p><b>CO4:</b> To understand the special features and specific adaptations in bacteria.</p>
<b>CORE XVII</b>	<b>ENVIRONMENTAL MICROBIOLOGY</b>	<p><b>CO1:</b> To understand the soil structure, soil microflora and biogeochemical cycle.</p> <p><b>CO2:</b> To correlate the role of microorganisms in aquatic ecosystem.</p> <p><b>CO3:</b> Perform basic experiment related to microbiological examination of water and wastewater.</p> <p><b>CO4:</b> To know different stages of waste water treatment and role of microorganisms in these processes.</p>
<b>CORE XVIII</b>	<b>CHEMISTRY-IV</b>	<p><b>CO1:</b> Understand the properties of lanthanides and actinides series. Their effect and their application in nuclear studies.</p> <p><b>CO2:</b> Be aware of the basics of active methylene compounds.</p> <p><b>CO3:</b> Obtain the information regarding colloids and their applications.</p> <p><b>CO4:</b> Understand the basic of wave mechanics and their construction.</p>
<b>CORE XIX</b>	<b>CAREER READINESS PROGRAM</b>	<p><b>CO1:</b> Understand the nuances of dealing with public at large</p> <p><b>CO2:</b> Exhibit professionalism in formal settings</p> <p><b>CO3:</b> Perform effectively in entrance exams and Campus Recruitment drives.</p> <p><b>CO4:</b> Communicate ideas effectively</p>
<b>CORE XX</b>	<b>ENGLISH FOR WORKPLACE</b>	<p><b>CO1:</b> To familiarize with workplace culture;</p> <p><b>CO2:</b> To share information and collect information;</p> <p><b>CO3:</b> To express one's views and agree or disagree with others;</p>

		<b>CO4:</b> To write workplace documents.
<b>CORE XXI</b>	<b>BIOINFORMATICS &amp; BIOSTATISTICS</b>	<p><b>CO1:</b> Recognize importance of Biostatistics in interpreting the biological data and design suitable experiments and Understand the errors obtained between different sets of experiments and calculate it precisely.</p> <p><b>CO2:</b> Comprehend the ways to utilize informatics system to derive useful biological information.</p> <p><b>CO3:</b> Use Bioinformatics tools to analyze different protein or nucleotide sequences to reach meaningful conclusions.</p> <p><b>CO4:</b> To suitably use the structural information available in order to design ways to manipulate molecular systems.</p>
<b>CORE XXII</b>	<b>MOLECULAR BIOLOGY &amp; GENETICS</b>	<p><b>CO1:</b> Learn about historical perspectives of central dogma of molecular biology.</p> <p><b>CO2:</b> Explain how genetic information is maintained and encoded in cell.</p> <p><b>CO3:</b> Differentiate between the function of various process involved in Central Dogma of Molecular Biology.</p> <p><b>CO4:</b> Justify the application of Molecular Biology in Genetic Engineering.</p>
<b>CORE XXIII</b>	<b>BIOCHEMICAL TECHNIQUES &amp; INSTRUMENTATION</b>	<p><b>CO1:</b> To understand the basics principle in biochemical studies.</p> <p><b>CO2:</b> To study different types of centrifuge with its applications and safety aspects in use of centrifuge.</p> <p><b>CO3:</b> To apply their knowledge to detection and determination of molecules using spectroscopy.</p> <p><b>CO4:</b> To study separation and detection methods of macromolecules</p>
<b>CORE XXIV</b>	<b>MICROBIAL BIOTECHNOLOGY</b>	<p><b>CO1:</b> Developing concepts for genetic modification of microorganisms used in biotechnology processes and industrially or environmentally useful processes.</p> <p><b>CO2:</b> Demonstrating application of various fungi for manufacturing of specific</p>



		<p>biomolecules, enhanced biochemical process and bioconversions.</p> <p><b>CO3:</b> Demonstrating application of various yeasts for manufacturing of specific biomolecules, enhanced biochemical process and bioconversions.</p> <p><b>CO4:</b> Demonstrating application of various algae for manufacturing of specific biomolecules, enhanced biochemical process and bioconversions.</p>
<b>CORE XXV</b>	<b>FERMENTATION TECHNOLOGY</b>	<p><b>CO1:</b> Methods for strain improvement and preservation of cultures.</p> <p><b>CO2:</b> Criteria for selection of media for microbial growth.</p> <p><b>CO3:</b> Design of various reactors used in Industries.</p> <p><b>CO4:</b> Upstream as well as downstream processing involved in fermentation industries with specific examples.</p>
<b>CORE XXVI</b>	<b>BASICS OF IMMUNOLOGY</b>	<p><b>CO1:</b> Explain functions of Immune System and differentiate between innate and adaptive immunity.</p> <p><b>CO2:</b> Describe development, activation and functions of various cells and organs of Immune System.</p> <p><b>CO3:</b> Apply knowledge of experimental immunological methods for disease diagnosis.</p> <p><b>CO4:</b> Rationalize the disease conditions during Immune System malfunction.</p>
<b>CORE XXVII</b>	<b>APPLIED MICROBIOLOGY</b>	<p><b>CO1:</b> To know the role of microorganisms in food and dairy industry.</p> <p><b>CO2:</b> To apply their knowledge to use of microorganism in various industrial applications.</p> <p><b>CO3:</b> To know the basics of plant tissue culture and agricultural microbiology.</p> <p><b>CO4:</b> Understand the significance of microorganisms in environmental microbiology.</p>

<p><b>CORE XXVIII</b></p>	<p><b>MEDICAL MICROBIOLOGY</b></p>	<p><b>CO1:</b> Understanding of the normal and common pathogenic organisms associated with human infectious diseases.  <b>CO2:</b> Enhanced understanding about the type of diseases caused by bacteria with mode of transmission and symptoms.  <b>CO3:</b> Enhanced understanding about the type of diseases caused by virus and fungi with mode of transmissions and symptoms.  <b>CO4:</b> Role and use of various antimicrobial agents and their mode of action.</p>
<p><b>CORE XXIX</b></p>	<p><b>VALUE EDUCATION</b></p>	<p><b>CO1:</b> Understand importance of role of Values in developing self  <b>CO2:</b> Inculcate right values, ethics, attitudes, manners and behaviours for life  <b>CO3:</b> Respond and relate with expectations, competitions and power of networking</p>
<p><b>CORE XXX</b></p>	<p><b>PROFESSIONAL ETHICS</b></p>	<p><b>CO1:</b> Understand the basics of human values  <b>CO2:</b> Inculcate human values to grow as responsible human beings with proper personality  <b>CO3:</b> Maintain ethical conduct and discharge their professional duties  <b>CO4:</b> Resolve ethical confusions and contradictions and bring harmony at thought, behaviour and action level.</p>

B. Sc.  
Chemistry  
(CO-PO-PSO)

Marwadi University



## Program Outcomes (PO)

<b>PO1</b>	Prepare the graduates who have a thorough knowledge of the fundamental aspects of science and an awareness of its applications.
<b>PO2</b>	To understand and acquire knowledge of Basic science relevant to the discipline.
<b>PO3</b>	To utilize appropriate key skills and tools for solving scientific problems.
<b>PO4</b>	To understand professional, ethical and social issues and responsibilities for the scientific community.
<b>PO5</b>	To apply the design and development principles in the construction of scientific systems of varying complexity
<b>PO6</b>	To categorize the graduates with skill sets for job opportunities in Research organizations, Private and Government jobs and further academic study.
<b>PO7</b>	To prepare the graduates with efficiency to independently initiate starts ups/entrepreneurship ventures.
<b>PO8</b>	To Prepare/nurture graduates with a holistic approach towards the identification and development of solutions to scientific challenges.
<b>PO9</b>	To prepare graduates who will work and communicate effectively in an inter-disciplinary environment

## Program Specific Outcomes (PSO)

<b>PSO1</b>	Students will be prepared with the strong fundamental knowledge to cater to the needs of industries/laboratories/academics.
<b>PSO2</b>	Ability to work for effective and practical solutions for issues related to chemical science while complying with economic, environmental, ethical and safety aspects.

## Course Outcomes (CO)

Course Outcomes for Sem-1, B. Sc.	
<b>Environmental Studies (02ES0131)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• After learning the course the students should be able to</li> <li>• Understand and realize the multi-disciplinary nature of the environment, its components, and inter-relationship between man and environment.</li> <li>• Understand the relevance and importance of the natural resources in the sustenance of life on earth and living standard.</li> <li>• Comprehend the importance of ecosystem, biodiversity and natural bio geo chemical cycle.</li> <li>• Conventional resources</li> <li>• Apply knowledge of Environment in daily life and find solution for problems related to Environment pollution.</li> </ul>
<b>Physics-I (02PY0132)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Apply knowledge of fundamental laws of physics to solve scientific problems.</li> <li>• Apply knowledge of rotational motion and SHM to solve problems of dynamics.</li> <li>• Apply knowledge of Gravitation in field of space science.</li> </ul>
<b>Reading and Writing for Science (02SL0102)</b>	<p>The course will enable the students..</p> <ul style="list-style-type: none"> <li>• Understand the usage of language in terms of reading and writing for science</li> <li>• To analyze and understand the language in context of science.</li> </ul>
<b>Speaking and Presentation Skills (02SL0103)</b>	<p>The course will enable students</p> <ul style="list-style-type: none"> <li>• To share information on familiar matters/issues in English</li> <li>• To make effective presentations in English</li> <li>• To gain confidence in speaking in English</li> </ul>
<b>Chemistry-I (02CY0101)</b>	<p>After completion of this course, student will be able to understand..</p> <ul style="list-style-type: none"> <li>• Understand the basic idea of atomic structure and its quantum mechanical concept.</li> <li>• Be aware of the basic concepts of various types of chemical bonding.</li> <li>• Obtain the basic idea of thermodynamics and analyse simple systems involving energy balance by applying the concept of</li> </ul>

	thermodynamics.
<b>Fundamental Chemistry-I (02CY0102)</b>	<p>After completion of this course, student will be able to understand..</p> <ul style="list-style-type: none"> <li>• Get the idea of various thermochemical processes and their applications.</li> <li>• Understand the concepts of various chemical bonding and covalent compounds.</li> <li>• Be aware of the basics of reaction mechanism, structure and stability of reacting constituents.</li> <li>• Obtain information regarding first, second and third order reaction and its applications.</li> <li>• Will be able to get more insights in the field of catalysis and reaction chemistry, which is very important by means of chemical industry process.</li> </ul>
<b>Value Education (02CR0103)</b>	<p>After successful completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand importance of role of Values in developing self</li> <li>• Inculcate right values, ethics, attitudes, manners and behaviors for life</li> <li>• Respond and relate with expectations, competitions and power of networking</li> </ul>
<b>Course Outcomes for Sem-2, B.Sc.</b>	
<b>Physics-II (02PY0182)</b>	<p>After completion of this course, the student will be able to understand</p> <ul style="list-style-type: none"> <li>• Apply knowledge of physics in other branches of science to solve scientific problems</li> </ul>
<b>English through Fiction (02SL0152)</b>	<p>At the end of the course, students will be able</p> <ul style="list-style-type: none"> <li>• To comprehend English used in Science-Fiction</li> <li>• To use vocabulary of Science-Fiction adequately</li> <li>• Narrate and describe incident, event or experience confidently in English</li> </ul>
<b>English through Movie (02SL0153)</b>	<p>The course will enable the learners to</p> <ul style="list-style-type: none"> <li>• Further enhance their basic language skills;</li> <li>• Identify and use different language functions in an audio-visual context;</li> <li>• Learn to use film and its elements as tools for language learning.</li> </ul>
<b>Calculus and Statistics (02MA0181)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Solve various kinds of problems related with one variable polynomials.</li> <li>• Understand idea of limit, continuity, derivative and integration.</li> <li>• Recognize the basic concepts such as Groups, Sub-groups, Abelian groups, permutation groups, cyclic groups etc.</li> <li>• Produce examples and counter examples illustrating the mathematical concepts in the course.</li> </ul>
<b>Chemistry-II (02CY0151)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the basic idea of Water analysis and Adsorption.</li> </ul>

	<ul style="list-style-type: none"> <li>• Be aware for the classification of elements and periodicity in property.</li> <li>• Capable to explain division of s, p, d and f blocks and their electronic configuration.</li> <li>• Obtain the basic idea of second law of Thermodynamics.</li> <li>• Get the idea of various thermochemical processes and their applications.</li> <li>• Get practical aspects of Water analysis.</li> <li>• Will develop knowledge to distinguish the adsorption phenomenon which is very important for surface chemistry point of view and will also spread light on thermodynamics.</li> </ul>
<b>Fundamental Chemistry-II (02CY0152)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the concepts of photochemical processes.</li> <li>• Be aware of the basics of reaction mechanism and structure &amp; stability of reacting constituents.</li> <li>• Obtain the information regarding first transition series and their applications.</li> <li>• Understand the basic of electrochemical reactions and their construction.</li> <li>• Gain the detail knowledge of 'd' block elements and their variable oxidation states,</li> <li>• which is of great interest for the formation of catalyst.</li> </ul>
<b>Professional Ethics (02CR0201)</b>	<p>After completion of this course, student will be able to:</p> <ul style="list-style-type: none"> <li>• Understand the basics of human values</li> <li>• Inculcate human values to grow as responsible human beings with proper personality</li> <li>• Maintain ethical conduct and discharge their professional duties Resolve ethical confusions and contradictions and bring harmony at thought, behaviour and action level.</li> </ul>
<b>Course Outcomes for Sem-3, B.Sc.</b>	
<b>Career Readiness Program (02CR0301)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand parts of speech concepts and usage</li> <li>• Understand Reading Comprehension and usage</li> <li>• Understand Tenses Past and Present concepts and usage</li> <li>• Understand the importance of personal and professional goals or benchmarks and create one for themselves.</li> <li>• Understand that Self Analysis or realization is the key to mastering any discipline</li> <li>• Understand the impact of attitude in personal success</li> </ul>
<b>Physics-III (02PY0231)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Apply knowledge of physics in other branches of science to solve scientific problems</li> </ul>
<b>Chemistry-III</b>	<p>After completion of this course, student will be able to</p>



<b>(02CY0201)</b>	<ul style="list-style-type: none"> <li>• Understand the behaviour and the involvement of the elements from periodic table while knowing the general chemistry.</li> <li>• Be aware of the basics of cycloalkanes; their methods of preparation, properties and stability.</li> <li>• Obtain the information regarding 's' and 'p' block elements and their applications.</li> <li>• Understand the basic of hydrolysis, Ionic solids and there various studies.</li> </ul>
<b>Fundamental Chemistry-II (02CY0202)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the concepts of co-ordination chemistry of d-block elements.</li> <li>• Be aware of the basics of reaction mechanism and structure &amp; stability of reacting constituents.</li> <li>• Obtain the information regarding qualitative and quantitative analysis.</li> <li>• Understand the basic of organic chemistry.</li> </ul>
<b>English through Non- (02SL0201)</b>	<p>This course will enable learners</p> <ul style="list-style-type: none"> <li>• to develop listening skills and answer comprehensive questions by applying the knowledge gained from the text;</li> <li>• to acquaint them with appropriate vocabulary and using the same vocabulary in different contexts;</li> <li>• to develop reading skills, by means of reading of different forms text relevant to non-fiction;</li> <li>• to develop writing skills focusing on the usage of language in the non-fictional text;</li> <li>• to construct a wide variety of sentences appropriate for non-fiction texts.</li> </ul>
<b>Course Outcomes for Sem-4, B.Sc.</b>	
<b>English for Workplace (02SL0251)</b>	<p>The course will enable the students</p> <ul style="list-style-type: none"> <li>• to familiarize with workplace culture;</li> <li>• to share information and collect information;</li> <li>• to express one's views and agree or disagree with others;</li> <li>• to write workplace documents.</li> </ul>
<b>Basic Biochemistry (02MB0253)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the concepts &amp; properties of molecules and their reactions.</li> <li>• Better understanding about the structure, composition &amp; properties of various biomolecules like carbohydrate, nucleic acids lipids, proteins and vitamins etc. Developing concepts about biological functions &amp; applications of biomolecules in various fields.</li> </ul>
<b>Career Readiness Program (02CR0401)</b>	<p>After the successful completion of the course in Advanced level students will be able to..</p> <ul style="list-style-type: none"> <li>• Understand the nuances of dealing with public at large</li> <li>• Exhibit professionalism in formal settings</li> </ul>

	<ul style="list-style-type: none"> <li>• Perform effectively in entrance exams and Campus Recruitment drives.</li> <li>• Communicate ideas effectively</li> </ul>
<b>Chemistry-IV (02CY0251)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the properties of lanthanides and actinides series. Their effect and their application in nuclear studies.</li> <li>• Be aware of the basics of active methylene compounds.</li> <li>• Obtain the information regarding colloids and their applications.</li> <li>• Understand the basic of wave mechanics and their construction.</li> </ul>
<b>Fundamental Chemistry-IV (02CY0252)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the important name reactions in organic chemistry course and rearrangement</li> <li>• Will know the basics of heterocyclic compounds and know the preparations.</li> <li>• Obtain the information regarding organometallic compounds.</li> <li>• Understand the basic of phase rule.</li> </ul>
<b>Course Outcomes for Sem-5, B.Sc.</b>	
<b>Inorganic and Industrial Chemistry (02CY0301)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the concepts of coordination chemistry.</li> <li>• Be aware of the basics of wave mechanics</li> <li>• Obtain the information regarding cement.</li> <li>• Understand the basic of ceramic, glass and refractory's.</li> <li>• Will know more about pesticides and insecticides.</li> </ul>
<b>Organic Chemistry (02CY0302)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the basics of stereochemistry.</li> <li>• Be aware of the basics of conformations and configuration.</li> <li>• Obtain the information regarding alkaloids and terpenoids.</li> <li>• Understand the basic of drugs and dyes.</li> </ul>
<b>Physical Chemistry (02CY0303)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the Electrolysis and electrical conductance.</li> <li>• Be aware of the basics of pH and potentiometry.</li> <li>• Obtain the information regarding third law of thermodynamics, free energy and chemical equilibrium.</li> <li>• Understand the basic of conductometry and colorimetry.</li> </ul>
<b>Analytical Chemistry (02CY0304)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the concepts errors and statics.</li> <li>• Be aware of the basics of environmental chemistry and its effect on nature.</li> <li>• Obtain the information regarding titration and methods of analysis.</li> <li>• Understand the basic of chromatography method.</li> </ul>
<b>Course Outcomes for Sem-6, B.Sc.</b>	

<p><b>Advanced Inorganic and Industrial Chemistry (02CY0351)</b></p>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the concepts of term symmetry.</li> <li>• Be aware of the knowledge of organometallic chemistry</li> <li>• Obtain the information regarding polymers and their applications.</li> <li>• Understand the basic of Fertilizers.</li> <li>• Will get an idea regarding petrochemicals and their imp in current scenario.</li> </ul>
<p><b>Advanced Organic Chemistry (02CY0352)</b></p>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the concepts of reactive intermediates, name reactions and rearrangements.</li> <li>• Be aware of the basics of reagents and its applications .</li> <li>• Obtain the information regarding carbohydrates and its chemistry.</li> </ul>
<p><b>Advanced Physical Chemistry (02CY0353)</b></p>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the concepts of nuclear chemistry.</li> <li>• Will know more about the activity and activity coefficient.</li> <li>• Obtain the information regarding crystallography and its various types. Brief idea regarding unit cell will also get.</li> <li>• Understand the physical properties and chemical constitution</li> </ul>
<p><b>Analytical Spectroscopic Techniques (02CY0354)</b></p>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the concepts of analytical technique UV spectroscopy.</li> <li>• Obtain the information regarding the IR spectroscopy.</li> <li>• Be aware of the basics of NMR spectroscopy.</li> <li>• Understand the basic of Mass spectrometry and their uses in construction of the molecules.</li> </ul>

## **DEPARTMENT OF MICROBIOLOGY**

### **POSTGRADUATE PROGRAM- MSc. Microbiology**

#### **Program Outcomes (POs)**

Sr. No.	Program Outcome Statement
<b>PO1</b>	Science Knowledge: Apply pure and interdisciplinary science knowledge for the solution of various scientific and engineering problems.
<b>PO2</b>	Problem analysis: Identify, formulate, review research literature, and analyze scientific problems reaching validated conclusions using basic principles of sciences.
<b>PO3</b>	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
<b>PO4</b>	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern IT tools including prediction and modeling to complex scientific activities with an understanding of the limitations.
<b>PO5</b>	The science and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practice.
<b>PO6</b>	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the scientific practice.
<b>PO7</b>	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO8</b>	Communication: Communicate effectively on various activities with the Science community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
<b>PO9</b>	Science projects and funding: Demonstrate knowledge for writing and managing scientific projects various disciplines and apply these to its own work, as a member and leader in a team, to manage funding for scientific projects from various funding agencies and NGOs.
<b>PO10</b>	Lifelong learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

## Program specific Outcomes (PSOs)

Sr. No.	Program Specific Outcomes Statement
<b>PSO1</b>	Students will acquire the necessary technical skills of life science enhancing their employability in the private and government sectors.
<b>PSO2</b>	Students will develop critical thinking abilities by getting exposure to research projects and internships which will be instrumental for all round development.

## Course Outcomes (COs)

**On completion of the course students will be able to**

COURSE COMPONENT	COURSE	COURSE OUTCOME
<b>CORE I</b>	<b>MICROBIAL DIVERSITY AND MOLECULAR PHYLOGENETICS</b>	<p><b>CO1:</b> Understanding evolution and principles in classifying microbial systems.</p> <p><b>CO2:</b> Comprehend the scientific basis of evolutionary relationship of microbes and analyze methods for microbial cultivation and identification.</p> <p><b>CO3:</b> Apprehend mechanisms involved for microbial sustenance at extreme conditions and it's significance.</p> <p><b>CO4:</b> Understand classification of bacteria and its beneficial and harmful effects.</p>
<b>CORE II</b>	<b>ENZYMOLGY</b>	<p><b>CO1:</b> Differentiate the function and mechanisms of various enzymes.</p> <p><b>CO2:</b> Analyse and design various enzymatic assays and study the impact various activators and inhibitors.</p> <p><b>CO3:</b> Optimize condition for enhanced enzyme activity.</p> <p><b>CO4:</b> Devise suitable strategies to apply the knowledge of enzymology for medical and industrial applications.</p>

<p><b>CORE III</b></p>	<p><b>CELL STRUCTURE AND ORGANIZATION</b></p>	<p><b>CO1:</b> Distinguish between various modes of transport across cell membranes.</p> <p><b>CO2:</b> Explain the function of various cellular organelles and its importance.</p> <p><b>CO3:</b> Explain various components of signal transduction and their cross talks.</p> <p><b>CO4:</b> Explain the organization of genetic material and cell cycle regulation.</p>
<p><b>CORE IV</b></p>	<p><b>FUNDAMENTAL BIOCHEMISTRY</b></p>	<p><b>CO1:</b> Understand and identify the biomolecules, their basic structure and composition.</p> <p><b>CO2:</b> Classify and characterize biomolecules and their subtypes based on their properties.</p> <p><b>CO3:</b> Examine and illustrate chemical reactions, biological interactions and analytical tools to study them.</p> <p><b>CO4:</b> Determine various biological functions and examine applications of biomolecules in various fields.</p>
<p><b>CORE V</b></p>	<p><b>EFFECTIVE COMMUNICATION SKILLS – I</b></p>	<p><b>CO1:</b> To speak on familiar matters/issues in English</p> <p><b>CO2:</b> To articulate their ideas effectively in terms of speaking in a scientific context</p> <p><b>CO3:</b> To make an effective oral presentation on a scientific topic</p>
<p><b>CORE VI</b></p>	<p><b>BIOANALYTICAL TECHNIQUES</b></p>	<p><b>CO1:</b> Comprehend insight of separation and visualization of biomolecules and techniques associated with it.</p> <p><b>CO2:</b> Understand the basic concept of spectroscopy, radioactivity and able to interpret spectroscopic data collected by the various methods.</p> <p><b>CO3:</b> Explain the theoretical principles of various separation techniques in chromatography, and typical applications of chromatographic techniques.</p> <p><b>CO4:</b> Understand basic principle, methodology and applications of Electrophoresis in separation and characterization of biomolecules.</p>

<p><b>CORE VII</b></p>	<p><b>BIostatISTICS AND BIOinformatics</b></p>	<p><b>CO1:</b> Recognize importance of Biostatistics in interpreting the biological data and design suitable experiments and understand the ways to report the results in a scientific way.</p> <p><b>CO2:</b> Understand the errors obtained between different sets of experiments and calculate it precisely.</p> <p><b>CO3:</b> Comprehend the ways to utilize informatics system to derive useful biological information.</p> <p><b>CO4:</b> Use Bioinformatic tools to analyze different protein or nucleotide sequences to reach meaningful conclusions.</p>
<p><b>CORE VIII</b></p>	<p><b>IMMUNOLOGY AND IMMUNOTECHNOLOGY</b></p>	<p><b>CO1:</b> Distinguish various components of Immune System</p> <p><b>CO2:</b> Explain the development and role of various cells and organs of Immune System.</p> <p><b>CO3:</b> Rationalize the disease conditions in created during Immune System malfunction.</p> <p><b>CO4:</b> Explain various experimental methods of immunology and its application in disease diagnosis and treatment.</p>
<p><b>CORE IX</b></p>	<p><b>MICROBIAL METABOLISM</b></p>	<p><b>CO1:</b> Identify and understand various biosynthesis &amp; breakdown pathways of biomolecules.</p> <p><b>CO2:</b> Summarize various types of biochemical reactions and metabolic regulations.</p> <p><b>CO3:</b> Illustrate and analyse bioenergetics associated with metabolism.</p> <p><b>CO4:</b> Analyse various methods of metabolic engineering and metabolic overproduction for different industrial purposes.</p>
<p><b>CORE X</b></p>	<p><b>SEMINAR I</b></p>	<p><b>CO1:</b> Perform sound literature survey.</p> <p><b>CO2:</b> Develop scientific presentation skills in stipulated time.</p>
<p><b>CORE X1</b></p>	<p><b>BIOPROCESS TECHNOLOGY</b></p>	<p><b>CO1:</b> Designing of bioreactors and control necessary for maximising production.</p>

		<p><b>CO2:</b> Select and optimize media for maximum production of microbial metabolites.</p> <p><b>CO3:</b> Designing of protocols for strain improvement and separation of molecules after fermentation process.</p>
<b>CORE XII</b>	<b>PHARMACEUTICAL MICROBIOLOGY</b>	<p><b>CO1:</b> Identify different antimicrobial agents and it's mode of action.</p> <p><b>CO2:</b> Process involved in Drug discovery and development</p> <p><b>CO3:</b> Regulatory guidelines in pharmaceuticals product.</p>
<b>CORE XIII</b>	<b>MOLECULAR BIOLOGY</b>	<p><b>CO1:</b> Understand the advanced concepts in molecular biology.</p> <p><b>CO2:</b> Comprehend the scientific basis of the current understanding in the broad domain of molecular biology.</p> <p><b>CO3:</b> Understand the ways to manipulate biological systems at the molecular level for scientific or technological gains.</p> <p><b>CO4:</b> Devise suitable strategies using the knowledge in molecular biology to solve technical problems.</p>
<b>CORE XIV</b>	<b>EFFECTIVE COMMUNICATION SKILLS - II</b>	<p><b>CO1:</b> To become proficient in formal communication in English</p> <p><b>CO2:</b> To prepare for group discussions and personal interviews</p>
<b>CORE XV</b>	<b>FOOD AND DAIRY MICROBIOLOGY</b>	<p><b>CO1:</b> Describe and comprehend the fundamental concepts of applied biotechnology.</p> <p><b>CO2:</b> Analyse primary literature articles in the field of applied microbiology to develop critical thinking skills and develop essential writing and verbal communication skills through essays and oral presentations that target the field of applied biotechnology.</p> <p><b>CO3:</b> To learn about the functioning of dairy industry.</p> <p><b>CO4:</b> To learn about the preparation, processing and storage of food items.</p>
<b>CORE XVI</b>	<b>ENVIRONMENTAL BIOTECHNOLOGY</b>	<p><b>CO1:</b> To describe and comprehend the fundamental concepts of solid waste management, biodegradation, bioremediation process and microbial treatment of waste water.</p>



		<p><b>CO2:</b> To understand, evaluate and analyze the role of aerobic and anaerobic microbial process in biogeochemical cycles, recycling and waste management strategies.</p> <p><b>CO3:</b> To analyze and develop critical thinking skills in order to communicate to a wide range of audiences with oral and written reports that target the field of environmental microbiology.</p> <p><b>CO4:</b> To acquire analytical skills in designing of cost effective and sustainable waste management strategies with consideration of public health, safety, welfare of society and environment by contributing to innovation and entrepreneurship.</p>
<b>CORE XVII</b>	<b>DISSERTATION PROJECT</b>	<p><b>CO1:</b> Students should be able to learn how to select and defend a topic of their research, how to effectively plan, execute, evaluate and discuss their experiments</p>

M. Sc.  
Chemistry  
(CO-PO-PSO)

Marwadi University



## Program Outcomes (PO)

PO1	Science Knowledge: Apply pure and interdisciplinary science knowledge for the solution of various scientific and engineering problems.
PO2	Problem analysis: Identify, formulate, review research literature, and analyze scientific problems reaching validated conclusions using basic principles of sciences.
PO3	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO4	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern IT tools including prediction and modeling to complex scientific activities with an understanding of the limitations.
PO5	The science and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practice.
PO6	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the scientific practice.
PO7	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO8	Communication: Communicate effectively on various activities with the Science community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO9	Science projects and funding: Demonstrate knowledge for writing and managing scientific projects various disciplines and apply these to its own work, as a member and leader in a team, to manage funding for scientific projects from various funding agencies and NGOs.
PO10	Lifelong learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

## Program Specific Outcomes (PSO)

PSO1	Graduates will inculcate technical skills towards the use of modern and sophisticated instruments, equipments and cheminformatics tools to analyze and obtain molecular information of the material.
PSO2	Students will be skilled to utilize the chemical literature to assess and identify problems significant to industries and society.

## Course Outcomes (CO)

Course Outcomes for Sem-1, M. Sc.	
<b>Chemistry-Concepts and Fundamentals (02CY0406)</b>	After completion of this course, student will be able to <ul style="list-style-type: none"> <li>• Generalize the basic concepts of organic chemistry, reaction intermediates and reaction pathways.</li> <li>• Predict the conformational preferences of common organic structures based on steric and electronic interactions and describe stereochemical and conformational structure on the chemical reactivity and on the mechanisms of organic reactions.</li> </ul>
<b>Physical Chemistry-I (02CY1401)</b>	After completion of this course, student will be able to <ul style="list-style-type: none"> <li>• Identify, select and explain which concepts are involved and the way of theoretical framework of quantum mechanics.</li> <li>• Identify, describe and explain the quantum mechanical behaviour of simple systems, such as the harmonic oscillator and the rigid rotor.</li> <li>• Understand the application of molecular spectroscopy to different areas of science.</li> <li>• Solve problems related to physical and chemical aspects of solid surfaces.</li> </ul>
<b>Inorganic Chemistry-I (02CY1402)</b>	After completion of this course, student will be able to- <ul style="list-style-type: none"> <li>• Explain the fundamental concepts in coordination chemistry of transition metals.</li> <li>• Explain the bonding characteristics in coordination compounds in term of Crystal Field Theory.</li> <li>• Relate the physical properties and reactivities of selected transition metal complexes with their structure and bonding.</li> <li>• Formulate mechanisms for reactions of transition metal complexes.</li> <li>• Realize the importance of inorganic compounds in bioinorganic chemistry.</li> </ul>
<b>Analytical Chemistry-I (02CY1404)</b>	After completion of this course, student will be able <ul style="list-style-type: none"> <li>• To develop an understanding of the range and theories of instrumental methods available in analytical chemistry.</li> <li>• To develop knowledge pertaining to the appropriate selection of instruments for the successful analysis of complex mixtures.</li> <li>• To develop an understanding of the role of the chemist in measurement and problem solving in chemical analysis.</li> <li>• To provide practical experience in selected instrumental methods of analysis.</li> <li>• To extend skills in procedures and instrumental methods applied in analytical tasks.</li> <li>• To expand skills in the scientific method of planning, developing, conducting, reviewing and reporting experiments.</li> </ul>

Course Outcomes for Sem-2, M. Sc.	
<b>Organic Chemistry-Essential Concepts (02CY0456)</b>	<p>After completion of this course, student will be able to explain</p> <ul style="list-style-type: none"> <li>• The concept of heterocyclic compounds.</li> <li>• Able to draw mechanisms for reactions involving heterocycles as starting materials, intermediates and products, and to propose syntheses of heterocycles from the major classes.</li> <li>• Organic reactions, rearrangements and cross-coupling reactions with their mechanism and applications.</li> </ul>
<b>Physical Chemistry-II (02CY1451)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Identify, select and explain which concepts are involved and the way of theoretical framework of statistical thermodynamics.</li> <li>• Identify, describe and explain the kinetics of simple as well as complex chemical reactions.</li> <li>• Understand the application of non-electrolyte solution to different areas of industrial applications.</li> <li>• Able to apply the basic concept of electrochemistry.</li> </ul>
<b>Inorganic Chemistry-II (02CY1452)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Explain the fundamental concepts in symmetry and group theory.</li> <li>• Explain the application of Mossbauer spectroscopy.</li> <li>• Analyse and implement bioinorganic chemistry in day to day life</li> <li>• Realize the importance of organometallic compounds and its role as catalyst in organic transformation.</li> </ul>
<b>Analytical Chemistry-II (02CY1454)</b>	<p>After completion of this course, student will be able</p> <ul style="list-style-type: none"> <li>• Recognized basic principle of various Extraction techniques.</li> <li>• Explain different Separation methods and also get idea about how to clean up sample from complex mixture.</li> <li>• Extend skills for Separation methods as well as Extraction methods for analytical tasks.</li> <li>• Capable to provide practical experience in selected Electro Gravimetric methods of analysis.</li> <li>• Realize the role of chemist for solve various kind of environmental issues.</li> </ul>
Course Outcomes for Sem-3, M. Sc.	
<b>Industrial Analysis (02CY0506)</b>	<p>After completion of this course, student will be able</p> <ul style="list-style-type: none"> <li>• To develop an understanding of the range and theories of instrumental methods available in Food, Pharma and Pesticide analysis.</li> <li>• To develop knowledge pertaining to the appropriate selection of instruments for the successful analysis of complex mixtures.</li> <li>• To develop an understanding of the role of the chemist in measurement and problem solving in chemical analysis.</li> <li>• To provide practical experience in selected instrumental methods</li> </ul>

	<p>of analysis</p> <ul style="list-style-type: none"> <li>To extend skills in procedures and instrumental methods applied in analytical tasks.</li> <li>To expand skills in the scientific method of planning, developing, conducting, reviewing and reporting experiments.</li> </ul>
<b>Selected topics in Analytical Chemistry (02CY0508)</b>	<p>After the successful completion of the course, students will,</p> <ul style="list-style-type: none"> <li>Capable to provide practical experience in selected Electro Gravimetric methods of analysis.</li> <li>Able to solve various kinds of environmental issues.</li> <li>Capable to developed separation method and choose different kinds of hyphenated instruments for the analysis</li> <li>Extend skills for preparation of standard operating procedure.</li> </ul>
<b>Essence of Chromatography (02CY0509)</b>	<p>After completion of this course, student will be,</p> <ul style="list-style-type: none"> <li>Capable to understand the range and theories of instrumental methods available in analytical chemistry.</li> <li>Able to select appropriate instrument for the successful analysis of complex mixtures.</li> <li>Capable to develop separation method of analysis.</li> <li>Trouble shoot analytical problems occur during analysis.</li> <li>Expand skills in the scientific method of planning, developing, conducting, reviewing and reporting experiments.</li> </ul>
<b>Advanced Analytical Techniques (02CY1501)</b>	<p>After the successful completion of the course, students will be able to understand,</p> <ul style="list-style-type: none"> <li>Spectroscopic and spectrometric methods</li> <li>Principle, theory, instrumentation and applications of spectroscopy and spectrometry.</li> </ul>
<b>Medicinal Chemistry (02CY0504)</b>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>Understand Drug metabolism and mechanism pathways.</li> <li>Explain Nucleophilic and electrophilic reaction mechanisms, catalyst and rearrangements reactions.</li> <li>Recognise and comment on different synthetic strategies and methods for stereocontrol when faced with a synthetic scheme.</li> <li>Able to draw mechanisms for reactions involving heterocycles as starting materials, intermediates and products, and to propose syntheses of heterocycles from the major classes.</li> </ul>
<b>Advanced Organic Chemistry – I (02CY0507)</b>	<p>After completion of this course, student will be able to understand</p> <ul style="list-style-type: none"> <li>Advanced concepts of Pericyclic reactions.</li> <li>Molecular rearrangements, mechanism and their applications.</li> <li>Recognise and comment on aromatic concept of organic compounds.</li> </ul>
<b>Course Outcomes for Sem-4, M. Sc.</b>	
<b>Research Methodology (02CY0551)</b>	<p>After completion of this course, post graduate will be able to</p> <ul style="list-style-type: none"> <li>Able to understand various aspects of research</li> <li>Analyze the data by using different methods</li> <li>Develop presentation skills (poster, seminar, publication), engage in research in the field of chemistry</li> </ul>

<p><b>Pharma Regulatory Affairs (02CY1553)</b></p>	<p>After completion of this course, student will be</p> <ul style="list-style-type: none"> <li>• Able to understand ICH guidelines and DMF.</li> <li>• Capable to validated analytical method with respect to ICH guideline</li> <li>• Able to perform calibration of various sophisticated instruments.</li> <li>• Primary exposor of lab scale to plant scale pharma product manufacturing</li> </ul>
<p><b>Dissertation/Project (02CY1554)</b></p>	<p>Students should be able to learn how to select and defend a topic of their research, how to effectively plan, execute, evaluate and discuss their experiments. Students should be able to demonstrate considerable improvement in the following areas: In-depth knowledge of the chosen area of research.</p> <ul style="list-style-type: none"> <li>• Capability to critically and systematically integrate knowledge to identify issues that must be addressed within framework of specific thesis.</li> <li>• Competence in research design and planning</li> <li>• Capability to create, analyse and critically evaluate different technical solutions.</li> <li>• Ability to conduct research independently.</li> <li>• Ability to perform analytical techniques/experimental methods.</li> <li>• Project management skills.</li> <li>• Report writing skills.</li> <li>• Problem solving skills.</li> <li>• Communication and interpersonal skills.</li> </ul>
<p><b>Advanced Organic Chemistry-II (02CY0555)</b></p>	<p>After completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Generalize the concepts of photochemistry</li> <li>• Understand and will have knowledge of chemistry of natural products like alkaloids, vitamins, carbohydrates and amino acids.</li> <li>• Understand the importance of protecting and deprotecting reagents useful in organic synthesis.</li> </ul>



**Faculty of Science**  
**Department of Mathematics**  
**Programme Name: Master of Science, Mathematics**  
**Programme Code: 02MA**

**Credits: 1 for Theory of 1 hour**  
**1 for Tutorial of 2 hours**  
**1 for Tutorial of 1 hour (in new teaching scheme)**  
**1 for Practical of 2 hours**

**Details of CO-PO-PSO**  
**Program Outcomes:**

- PO1: **Science Knowledge:** Apply pure and interdisciplinary science knowledge for the solution of various scientific and engineering problems.
- PO2: **Problem analysis:** Identify, formulate, review research literature, and analyze scientific problems reaching validated conclusions using basic principles of sciences.
- PO3: **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO4: **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern IT tools including prediction and modeling to complex scientific activities with an understanding of the limitations.
- PO5: **The science and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practice.
- PO6: **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the scientific practice.
- PO7: **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO8: **Communication:** Communicate effectively on various activities with the Science community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO9: **Science projects and funding:** Demonstrate knowledge for writing and managing scientific projects various disciplines and apply these to its own work, as a member and leader in a team, to manage funding for scientific projects from various funding agencies and NGOs.
- PO10: **Lifelong learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technical knowledge.

**Program Specific Outcomes:**

- PSO1: To enable students to present mathematical content in simple and interesting manner without losing the preciseness and hence leading them to become a better educator.
- PSO2: To enable students to have grasp over various mathematical structures and apply them whenever necessary.

## **COURSE OUTCOMES**

### **M.Sc. Mathematics**

**From the Year 2016-20 in which program introduced**

#### **Semester1**

**Course Title                    COMPLEX ANALYSIS**

**Course Code                    02MA0401**

CO1 : Generalize the concept of functions, limits, continuity, differentiability and analyticity in complex variables.

CO2 : Understand and apply the knowledge of elementary functions and harmonic functions.

CO3 : Evaluate contour integrals, Generalize the idea of series expansions at the singular points by Laurent's series and use it in complex integrations.

CO4 : Classify zeros and singularities of complex functions.

CO5 : Understand and apply conformal mapping and harmonic function theory in for solving complex planes and interpret them graphically.

**Course Title                    GRAPH THEORY**

**Course Code                    02MA0402**

CO1 : Understand the concepts of graphs and its properties

CO2 : Apply first and second theorem of graph theory for various graphs

CO3 : Apply the concepts of graph theory to solve real life problems

CO4 : Identify the planarity of a graph

CO5 : Evaluate matrix form of a graph to find rank and nullity of a graph.

**Course Title                    OPTIMIZATION TECHNIQUES**

**Course Code                    02MA0403**

CO1 : Understand the need of using linear and non-linear optimization techniques-an approach for effective decision making.

CO2 : Formulate various mathematical models for real life situations/problems.

CO3 : Plan phases of any project and various activities that need to be done during these phases.

CO4 : Interpret the concept of inventory control as well as various forms and functional role of inventory.

CO5 : Apply and classify the replacement and maintenance analysis techniques.

**Course Title                    REAL ANALYSIS-1**

**Course Code                    02MA0404**

CO1 : Understand and Summarize the theoretical aspects associated with Lebesgue measure and Lebesgue integral.

CO2 : Apply/Identify/Solve using concepts of measure theory, whether the given Set or Function or Integral is Lebesgue measurable set or Lebesgue measurable function or

Lebesgue Integral respectively.

CO3 : Distinguish and analyze the properties that are satisfied by Lebesgue measurable set/ Lebesgue measurable function/ Lebesgue integral compared with ordinary set/function/integral respectively.

CO4 : Prove or evaluate various results that are in a relationship with the theory of Lebesgue measure/integral.

CO5 : Construct new sets/functions/integrals that satisfy conditions of Lebesgue measure/integral and compare them with ordinary sets/functions.

**Course Title**                    **TOPOLOGY**

**Course Code**                    **02MA0405**

CO1 : Understand terms, definition and theorems related to topological spaces.

CO2 : Demonstrate knowledge and understanding of concepts such as open and closed sets, interior, closure and boundary.

CO3 : Create new topological spaces by using different types of topology.

CO4 : Use continuous function to understand structure of topological spaces

CO5 : Identify compact spaces, connected spaces, Hausdorff spaces, Regular spaces and Normal spaces.

CO6 : State the Urysohn's Lemma, The Tietze Extension Theorem and explain their importance.

## **Semester2**

**Course Title**                    **ABSTRACT ALGEBRA**

**Course Code**                    **02MA0451**

CO1 : Apply Sylow theorems to identify the structure of groups.

CO2 : Demonstrate the properties of groups, rings and Fields.

CO3 : Analyse the structure of polynomial rings and Extension fields.

CO4 : Decide the reducibility and irreducibility of a polynomial over a field.

CO5 : Discuss the solvability of polynomials using Galois Theory.

**Course Title**                    **DIFFERENTIAL EQUATIONS**

**Course Code**                    **02MA0452**

CO1 : Understanding the existence and uniqueness of first order and nth -order differential equation and analysing it in complex n-dimensional space.

CO2 : Analyse real world situations to identify when ordinary differential equations are appropriate to formulate mathematical models and solve the problems using multiple approaches.

CO3 : Demonstrate understanding of the meaning of an partial differential equation, its order, degree, formation and different types.

CO4 : Classify the linearity of PDE and solving them using appropriate methods such as Charpit's method or Lagrange's method.

CO5 : Applying the concepts of PDE to solve heat equation, wave equation and Laplace equation.

**Course Title**                    **NUMERICAL ANALYSIS WITH MATLAB PROGRAMMING**

**Course Code**                    **02MA0453**

CO1 : Apply numerical methods to find solution of algebraic equations using different methods under different conditions, and numerical solution of system of algebraic equations.

CO2 : Understand various interpolation methods and finite difference concepts.

CO3 : Work out numerical differentiation and integration whenever and wherever routine methods are not applicable.

CO4 : apply numerical solution of ordinary and partial differential equations,

CO5 : familiar with effective numerical methods for obtaining approximate results of the complex mathematical problems using numerical packages/tools like MATLAB.

CO6 : Understanding the application of numerical methods in engineering and science.

**Course Title**                    **NUMBER THEORY**

**Course Code**                    **02MA0454**

CO1 : Solve problems involving Divisibility, The Greatest Common divisor, Euclidean Algorithm and Fundamental Theorem of Arithmetic.

CO2 : Use theory of Congruences to solve problems.

CO4 : Use basic Number Theoretic Functions to solve the problems.

CO3 : Apply Chinese Remainder theorem to solve problems.

CO5 : Apply Euler's criterion to check solvability of quadratic congruences.

**Course Title**                    **REAL ANALYSIS-II**

**Course Code**                    **02MA0455**

CO1 : Understand the concepts related to General Lebesgue Integral of functions and their properties, in particular for  $L_p$  - spaces.

CO2 : Apply the theory of Lebesgue integral on various functions and analyze their properties.

CO3 : Analyze the theory for Lebesgue integral associated with  $L_p$  - spaces.

CO4 : Evaluate the theoretical problems associated with General Lebesgue Integral and its properties.

CO5 : Create new problems that would involve the aspects of General Lebesgue Integral and also the  $L_p$  - spaces.

### **Semester3**

**Course Title**                    **CALCULUS OF VARIATIONS AND INTEGRAL EQUATIONS**

**Course Code**                    **02MA0501**

CO1 : Understand what are functionals and have some appreciation of their applications in

mathematics and physics.

CO2 : Applying the knowledge to solve brachistochrone problem, isoperimetric problems and differential equations for stationary paths, subject to boundary conditions.

CO3 : Understand the relationship between integral and differential equations.

CO4 : Solving linear integral equations by analysing various kernels.

CO5 : Solve Sturm-Liouville's equation.

**Course Title**                    **CLASSICAL MECHANICS**

**Course Code**                    **02MA0502**

CO1 : Understand Newton's laws, Lagrange's function and Hamiltonian function

CO2 : Find kinetic energy and potential energy for the moving particles.

CO3 : Apply Lagrange's equation of motion for various motions.

CO4 : Apply Hamilton's Canonical equations for various motions.

CO5 : Evaluate Lagrange and Poisson brackets

**Course Title**                    **FINANCIAL MATHEMATICS**

**Course Code**                    **02MA0503**

CO1 : Develop in students an understanding of mathematics as a deductive science.

CO2 : Understand the fundamental concepts such as cash flows, Present value, Future value, Yield and probability etc..

CO3 : Communicate the basics of stochastic interest rate models and use it to evaluate simple cash flow models.

CO4 : Understand the options. Hedging and pricing problems in finance, know how to formulate these problems as mathematical models and understand the computational techniques to solve the arising problems

CO5 : To apply mathematical thinking to real-world situations.

CO6 : Able to learn and solve the problems of stock market

**Course Title**                    **LINEAR ALGEBRA**

**Course Code**                    **02MA0504**

CO1 : Understand the properties exhibited by Vector Spaces and their relationship using Linear Transformations.

CO2 : Analyze the properties that are exhibited by Linear Transformation and their relationship with Matrices.

CO3 : Apply the theorems on Vector Spaces and Linear Transformations to draw valid conclusions.

CO4 : Solve linear systems of equations for vector spaces using linear transformations and converting them into matrix form to classify into various types.

CO5 : Create an abstract vector space that would satisfy the generalized properties of Linear Transformation and Matrix Theory associated with Vector Spaces.

CO6 : Construct a vector space that are in correspondence with the physical systems in real life.

**Course Title**                    **SPECIAL FUNCTIONS-I**

**Course Code**                    **02MA0505**

- CO1 : Understand the concepts of Infinite products and use them to redefine Gamma and Beta functions
- CO2 : Analyze the properties of Beta functions and Gamma functions.
- CO3 : Perform operations with Bessel functions to derive differential equations and integral result along with the corresponding recurrence formulae.
- CO4 : Apply the concepts of Hypergeometric functions to obtain various results.
- CO5 : Explain the applications and the usefulness of generating functions..

#### **Semester4**

**Course Title**                    **FUNCTIONAL ANALYSIS**

**Course Code**                    **02MA0551**

- CO1 : Describe properties of normed linear spaces
- CO2 : Understand the dual of a normed linear space.
- CO3 : construct examples of normed linear spaces.
- CO4 : Prove that a given space is a Banach space or a Hilbert space.
- CO5 : To be acquainted with the statement of the Hahn-Banach theorem and its corollaries.
- CO6 : Study advanced texts in functional analysis

**Course Title**                    **SPECIAL THEORY OF RELATIVITY**

**Course Code**                    **02MA0552**

- CO1 : Demonstrate the difference in viewing of various physical phenomenon from Special Relativity viewpoint.
- CO2 : Analyze various cases of Doppler's effect.
- CO3 : Discuss the concept of space time diagram and apply it to derive the Twin paradox resolution
- CO4 : Apply relativity concepts to the dynamics of a moving particle.
- CO5 : Understand the theories that form the basis of general relativity.

**Course Title**                    **IMAGE PROCESSING AND FUZZY LOGIC USING  
MATLAB**

**Course Code**                    **02MA0553**

- CO1 : describe and explain basic concepts of digital image processing,
- CO2 : understand the need for image transforms and learn different techniques employed for the enhancement of images,
- CO3 : apply various methods of image segmentation and compression,
- CO4 : distinguish between the crisp set and fuzzy set concepts,
- CO5 : expose various possible applications of the image processing and analysis.

**Course Title**                    **DIFFERENTIAL GEOMETRY**

**Course Code**                    **02MA0554**

- CO1 : Have a deep understanding of first and second fundamental forms of surface
- CO2 : Find the osculating surface and the osculating curve at any point of a given curve
- CO3 : Understand the Gaussian curvature, the mean curvature, the curvature lines, the

asymptotic lines, the geodesics of a surface

CO4 : Calculate the curvature and torsion of a curve

CO5 : Use efficiently the mathematical tool of tensor calculus in the study of surfaces

**Course Title**                    **SPECIAL FUNCTIONS-II**

**Course Code**                    **02MA0555**

CO1 : Understand concept of Fourier series, Fourier Integral and Fourier transform.

CO2 : Analyze the properties of Hankel transform, Mellin Transform and Z-transform.

CO3 : Apply the concepts of Hankel transform, Mellin Transform and Z-transform to solve differential equations.

CO4 : Obtain Legendre polynomials and Laguerre polynomials from the solutions of their differential equation, generating function as well as Rodrigues' formula.

CO5 : Perform different operations with orthogonal polynomials, Legendre's polynomial and Laguerre polynomial with their differential equations, corresponding recurrence relations and properties.

**From the Year 2020-21 in which Program revised:**

**Course Outcome: CO of course “Predicate Calculus and Graph Theory”**

CO1: distinguish between valid and invalid mathematical arguments.

CO2: exploring one particular way of representing facts - the language of logic.

CO3: identify various types of directed graphs and their properties.

CO4: understand the concepts of planarity, coloring, matching and factors of graphs.

CO5: deal with research problems on graph algorithms.

**CO of course “Optimization Techniques”**

CO1: appreciate application of integer LP problem in several areas of managerial decision-making.

CO2: identify and examine situations that generate queuing problems.

CO3: interpret the concept of inventory control as well as various forms and functional role of inventory.

CO4: use basic concepts of calculus-based methods to obtain an optimal solution of problem that involve continuous and differential functions.

CO5: understand advance procedures to solve optimization problems.

**CO of course “Introduction to Measure Theory”**

CO1: understand and summarize the theoretical aspects associated with Lebesgue measure and Lebesgue integral.

CO2: apply/identify/solve using concepts of measure theory, whether the given Set or function or integral is Lebesgue measurable set or Lebesgue measurable function or Lebesgue integral respectively.

CO3: distinguish and analyse the properties that are satisfied by Lebesgue measurable set/ Lebesgue measurable function/ Lebesgue integral compared with ordinary set/function/integral respectively.

CO4: prove or evaluate various results that are in relationship with theory of Lebesgue measure/integral.

CO5: construct new sets/functions/integrals that satisfy conditions of Lebesgue measure/integral and compare them with ordinary sets/functions.

**CO of course “Partial Differential Equations”**

CO1: classify different partial differential equations and form partial differential equations.

CO2: solve linear and non-linear first order PDE

CO3: evaluate higher order partial differential equations.

CO4: classify the second order partial differential equations and reduce them to normal form.

CO5: applying concepts of partial differential equations by formulating and solving heat, wave and Laplace equation.

**CO of course “Numerical Analysis with MATLAB Programming”**

CO1: understanding what roots problems are and where they occur in engineering and science.

CO2: knowing solution of a system of linear algebraic equations and the mathematical definition of eigenvalues and eigenvectors.

CO3: find the equation of the curve of best fit which may be most suitable for predicting the unknown values.

CO4: understanding the application numerical differentiation and integration formulas.

CO5: knowing how to solve problems in science and technology with differential equation.

**CO of course “Classical Mechanics and Relativity”**

CO1: describe different motion using Lagrange’s and Hamilton’s equation.

CO2: find kinetic energy and potential energy for the moving particles.

CO3: explain the kinematics of rigid body.

CO4: find equation of motion for small oscillations.

CO5: understand the importance of the theory of relativity.

**CO of course “Mathematical Statistics”**

CO1: understand the mathematical basis of probability and its applications in various fields of life.

CO2: adapt the knowledge of various theoretical distributions and their applications.

CO3: evaluate correlation, regression and fit the linear regression models with the correlated data.

CO4: apply Chi square test in different types of situations and understand the concept of F-test and Analysis of Variance.

CO5: apply statistical techniques for quality control.

**CO of course “Financial Mathematics”**

CO1: understand the mathematical foundations of quantitative finance.

CO2: construct, evaluate and analyze models for investments and securities.

CO3: design, build, investigate and evaluate forward contract using arbitrage-free pricing methods.

CO4: solve problems using a range of formats and approaches in basic science.

CO5: apply scientific models and tools effectively.



**CO of course “Functional Analysis”**

CO1: understand the fundamental concepts related to normed spaces/banach spaces/inner product spaces/Hilbert spaces.

CO2: apply the theorems and results on relevant Spaces to solve problems in O.D.E., P.D.E., numerical analysis, calculus of variations, etc.

CO3: analyse the properties of Normed space/ inner product space and investigate new results associated with them.

CO4: prove the results that are associated with fundamental theorems of normed spaces/inner product spaces.

CO5: create and study new spaces that would satisfy the fundamental results of normed space/inner product space and there by proposing alternative solutions.

**CO of course “Image Processing and Fuzzy Logic using MATLAB”**

CO1: understand the mathematical principles that are widely used in digital image processing.

CO2: understand the mathematical foundations for digital image compression, image segmentation, image morphology, and image enhancement.

CO3: use MATLAB software for various digital image processing applications.

CO4: distinguish between the crisp set and fuzzy set concepts.

CO5: demonstrate research skill associated with the domain of image processing.

**CO of course “Special Functions and Integral Transforms”**

CO1: understanding the concepts of infinite product, beta function and Gamma function

CO2: exploring different properties of Beta function, Gamma function and hypergeometric functions.

CO3: analysing Bessels function and generating functions.

CO4: analyse and apply the concepts of Hankel, Mellin and Z-transform to solve differential equations.

CO5: perform different operations with orthogonal polynomials, Legendre’s polynomial and Laguerre polynomial with their differential equations, corresponding recurrence relations and properties.

**CO of course “Mathematical Modeling and Simulation”**

CO1: understand the techniques and the characteristics of mathematical models.

CO2: analyse real world situations and convert in to mathematical models.

CO3: solve real world problems using mathematical models.

CO4: apply the theory of graphs, differential equations and difference equations in mathematical models.

CO5: understand simulation modeling and compare with analytic methods.



**Program Outcome (PO)**

P01	Science Knowledge: Apply pure and interdisciplinary science knowledge for the solution of various scientific and engineering problems.
P02	Problem analysis: Identify, formulate, review research literature, and analyze scientific problems reaching validated conclusions using basic principles of sciences.
P03	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
P04	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern IT tools including prediction and modeling to complex scientific activities with an understanding of the limitations.
P05	The science and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practice.
P06	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the scientific practice.
P07	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
P08	Communication: Communicate effectively on various activities with the Science community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
P09	Science projects and funding: Demonstrate knowledge for writing and managing scientific projects various disciplines and apply these to its own work, as a member and leader in a team, to manage funding for scientific projects from various funding agencies and NGOs.
P010	Lifelong learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
<b>Program Specific Outcome</b>	
PSO1	Understanding and demonstration knowledge of the principles of physics to execute projects in multidisciplinary environment.
PSO2	Acquire research base knowledge to address the local societal problems meet to become a successful entrepreneur.



Course Outcome (CO)

<b>Subject Code: 02PY0401</b>	
<b>Subject Name: Atomic and Molecular Physics</b>	
C01	Gain the thorough understanding of the basic structure of hydrogen like atoms
C02	Learn the selection rules for two-electron atoms and many-electron atoms
C03	Apply various molecular spectroscopy principles
C04	Apply knowledge of physics to become successful in national level examinations like NET, SLAT, GATE etc.
C05	Engage in research in the field of pure and applied physics and involve in life-long learning
<b>Subject Code: 02PY0403</b>	
<b>Subject Name: Mathematical Physics-I</b>	
C01	Introspect various concepts of mathematical methods in physics – vector algebra and calculus, differential equations, fourier analysis
C02	Apply knowledge of mathematical physics as a basic science in solving real life and scientific problems
C03	Apply knowledge of physics to become successful in national level examinations like NET, SLAT, GATE etc.
C04	Engage in research in the field of pure and applied physics and involve in life-long learning
<b>Subject Code: 02PY0406</b>	
<b>Subject Name: Laboratory Practicals 1</b>	
C01	Gain the hands-on experience in performing fundamental experiments in semiconductor physics, electronics and nuclear physics.
C02	Understand the underlying physical process
C03	Analyse the experimental data
C04	Demonstrate the ability to use De-Morgan's theorem
<b>Subject Code: 02PY0407</b>	
<b>Subject Name: Laboratory Practicals 2</b>	
C01	Gain the hands-on experience in performing experiments in semiconductor devices and atomic-molecular physics.
C02	Able to interpret result and report it
C03	Apply understanding of experiment in technical problem
C04	Validate theory from the result of the practical.
<b>Subject Code: 02PY0408</b>	
<b>Subject Name: Classical Mechanics</b>	
C01	Understand some fundamental laws of physics in the classical domain. This gives basic understanding to develop such laws of physics in quantum physics.
C02	Apply knowledge of physics as a basic science in solving real life and scientific problems
C03	Apply knowledge of physics to become successful in national level examinations like



	NET, SLAT, GATE etc.
C04	Engage in research in the field of pure and applied physics and involve in life-long learning
<b>Subject Code: 02PY0409; Subject Name Nanomaterials - Synthesis and Deposition</b>	
C01	Analyse various physical and chemical methods and its advantages and disadvantages
C02	Analyse different techniques of thin film deposition
C03	Apply knowledge of physics to become successful in national level examinations like NET, SLAT, GATE etc.
C04	Engage in research in the field of pure and applied physics and involve in life-long learning
<b>Subject Code: 02PY0410 Subject Name: Electronics-I</b>	
C01	Interpret the basics of semiconductor physics and its importance in various optoelectronic devices.
C02	Apply knowledge of physics as a basic science in solving real life and scientific problems
C03	Apply knowledge of physics to become successful in national level examinations like NET, SLAT, GATE etc.
C04	Engage in research in the field of pure and applied physics and involve in life-long learning
<b>Subject Code: 02PY0451 Subject Name: Electromagnetic Theory</b>	
C01	Learn the concepts of electromagnetics and apply it in communication physics.
C02	Apply knowledge of physics as a basic science in solving real life and scientific problems
C03	Apply knowledge of physics to become successful in national level examinations like NET, SLAT, GATE etc.
C04	Engage in research in the field of pure and applied physics and involve in life-long learning
<b>Subject Code: 02PY0453 Subject Name: Material Characterization</b>	
C01	Recognize the analytical techniques for studying the Structural, Microstructural, Optical and Transport properties.
C02	Differentiate the most advanced imaging instruments and their workings.
C03	Apply knowledge of physics as a basic science in solving real life and scientific problems
C04	Apply knowledge of physics to become successful in national level examinations like NET, SLAT, GATE etc.
C05	Engage in research in the field of pure and applied physics and involve in life-long learning
<b>Subject Code: 02PY0455 Subject Name: Quantum Mechanics</b>	
C01	Inspect the fundamental postulates of quantum mechanics
C02	Analyse various phenomena of quantum photonics



C03	Apply knowledge of physics as a basic science in solving real life and scientific problems
C04	Apply knowledge of physics to become successful in national level examinations like NET, SLAT, GATE etc.
C05	Engage in research in the field of pure and applied physics and involve in life-long learning
<b>Subject Code: 02PY0456</b>	
<b>Subject Name: Electronics Lab</b>	
C01	Differentiate different I-V characteristics of thyristors and Op-Amp.
C02	Understand the roles of diodes and transistors in the function of various ICs.
C03	Develop experimentation skills and understand importance of measurement practices in science & technology.
C04	Evaluate possible causes of discrepancy in practical experimental observations in comparison to theory.
<b>Subject Code: 02PY0457</b>	
<b>Subject Name: Laboratory Practicals-3</b>	
C01	Apply concepts of electromagnetic theory in practical applications.
C02	Apply the concepts of interferences and polarization.
C03	Demonstrate the ability to measure properties of a variety of optical systems.
C04	Understand mechanism and application of some optical instruments.
<b>Subject Code: 02PY0458</b>	
<b>Subject Name: Mathematical Physics-II</b>	
C01	Apply and analyze various methods of mathematical physics – complex functions, power series method, advanced linear algebra and partial differential equations
C02	Apply knowledge of mathematical physics as an applied science in solving real life and scientific problems
C03	Apply knowledge of physics to become successful in national level examinations like NET, SLAT, GATE etc.
C04	Apply the knowledge of mathematics to model complex problems in interdisciplinary subject.
<b>Subject Code: 02PY0459</b>	
<b>Subject Name: Electronics-II</b>	
C01	Interpret various electronic devices
C02	Identify the mechanism and applications of various amplifiers and oscillators
C03	Apply knowledge of physics as a basic science in solving real life and scientific problems
C04	Apply knowledge of physics to become successful in national level examinations like NET, SLAT, GATE etc.
C05	Engage in research in the field of pure and applied physics and involve in life-long learning
<b>Subject Code: 02PY0502</b>	
<b>Subject Name: Communication Physics</b>	
C01	Interpret various properties of electromagnetic waves and its propagation in



	waveguides
C02	Identify the applications in communications.
C03	Apply knowledge of physics as a basic science in solving real life and scientific problems
C04	Apply knowledge of physics to become successful in national level examinations like NET, SLAT, GATE etc.
C05	Engage in research in the field of pure and applied physics and involve in life-long learning
<b>Subject Code: 02PY0503</b>	
<b>Subject Name: Solid State Physics</b>	
C01	Identify the importance of crystal physics to analyze the materials properties.
C02	Apply knowledge of physical phenomena taking place which are responsible for the particular characteristics of the materials.
C03	Apply knowledge of physics to become successful in national level examinations like NET, SLAT, GATE etc.
C04	Useful for the understanding of the properties of advanced materials in research and apply to understand the characteristics of the advanced materials.
<b>Subject Code: 02PY0504</b>	
<b>Subject Name: Research Methodology</b>	
C01	Identify the research gap and various methodologies to solve the problems
C02	Analyze the data by using different methods and develop presentation skills
C03	Engage in research in the field of pure and applied physics and involve in life-long learning
C04	Learn the scientific writing.
<b>Subject Code: 02PY0505</b>	
<b>Subject Name: Material Science Lab</b>	
C01	Practise the hands-on experience in performing experiments in functional oxide material.
C02	Characterize various kind of oxide material.
C03	Analyze the structure of materials at different levels using computational tool.
C04	Develop an understanding of the unique properties of superconductor materials
<b>Subject Code: 02PY0506</b>	
<b>Subject Name: Laboratory Practicals-4</b>	
C01	Practice the hands-on experience in performing experiments related to optics, electronics and quantum mechanics.
C02	To verify some basic laws of optics and quantum mechanics on the basis experiments.
C03	To understand practical use of electronics in optics and quantum mechanics.
C04	To apply practical understanding of the optical and electronic instruments to make other onto-electronics devices.
<b>Subject Code: 02PY0507</b>	
<b>Subject Name: Thermodynamics and Statistical Mechanics</b>	
C01	Recognize various aspects and scopes of statistical thermodynamics
C02	Apply the usefulness of micro-canonical, canonical and grand canonical ensembles.



C03	Identify the application aspects of statistical mechanics
C04	Apply knowledge of physics to become successful in national level examinations like NET, SLAT, GATE etc.
C05	Engage in research in the field of pure and applied physics and involve in life-long learning
<b>Subject Code: 02PY0531</b>	
<b>Subject Name: Plasma Physics</b>	
C01	Interpret the basics of the plasma parameters and related fluid equations
C02	Analyze the behaviour of electromagnetic waves and electron beam with plasma
C03	Introspect the particle motions under the influence of external electric and magnetic field
C04	Apply knowledge of physics as a basic science in solving real life and scientific problems
C05	Apply knowledge of physics to become successful in national
C06	Engage in research in the field of pure and applied physics and involve in life- long learning
<b>Subject Code: 02PY0532</b>	
<b>Subject Name: Functional Oxides</b>	
C01	Familiarize the students with the fundamental concepts of various kinds of Oxide materials.
C02	Examine various material properties used for advance technology.
C03	Recognize the usefulness of materials in various technological applications.
C04	Apply knowledge of how the properties of these materials can be changed as a function of various parameters.
<b>Subject Code: 02PY0533</b>	
<b>Subject Name: VLSI</b>	
C01	Semiconductor physics.
C02	MOS capacitor modeling and effects of frequency on C-V characteristic.
C03	MOSFET modeling techniques.
C04	Short-channel effects and its modeling.
C05	Need of large signal MOSFET modeling.
C06	MOSFET parameter measurements.
C07	Benchmark tests for MOSFET models
<b>Subject Code: 02PY0534</b>	
<b>Subject Name: Digital Electronics and Microprocessor</b>	
C01	Understand Hard description language like VHDL and Verilog
C02	Understand FPGA and CPLD Architecture in detail



C03	Verify the design using simulator tool
C04	Implement design on FPGA
C05	Optimize the design using place and route concept
<b>Subject Code: 02PY0551</b>	
<b>Subject Name: Applied Optics</b>	
C01	Identify different applications of optics i.e. Laser, Fiber Optics, Optoelectronics and Non Linear Optics.
C02	Analyze different laser systems and its applications in various fields.
C03	Apply the concept of optical fiber, its construction and importance in communication physics.
C04	Classify the concepts of opto-isolaters and opto-couplers.
C05	Interpret the concepts of Non Linear Optics (NLO) and will able to distinguish the different harmonic generation NLO materials.
<b>Subject Code: 02PY0552</b>	
<b>Subject Name: Nuclear Physics</b>	
C01	Analyze various nuclear forces and its interactions
C02	Interpret different nuclear models
C03	Understand the design of nuclear reactors and understand the process of nuclear decays
C04	Apply knowledge of physics as a basic science in solving real life and scientific problems
C05	Apply knowledge of physics to become successful in national level examinations like NET, SLAT, GATE etc.
<b>Subject Code: 02PY0553</b>	
<b>Subject Name: Project</b>	
C01	Identify their technical field of interest and connect it in a research domain
C02	Analyse the scientific data and interpret the results
C03	Engage in the field of pure and applied physics and involve in life-long learning
C04	Apply the concept of physics to solve scientific problem.
<b>Subject Code: 02PY0581</b>	
<b>Subject Name: Thin Film and Solar Cell</b>	
C01	Learn about various physical and chemical methods and its advantages and disadvantages
C02	Get familiar with different techniques of thin film deposition
C03	Study the basic aspects of single crystals growth
C04	Apply knowledge of physics to become successful in national level examinations like NET, SLAT, GATE etc.
C05	Engage in research in the field of pure and applied physics and involve in life-long learning
<b>Subject Code: 02PY0582</b>	
<b>Subject Name: Atmospheric and Space Physics</b>	
C01	Identify mechanism involved in the dynamics of atmosphere.
C02	Measure parameters which are affecting weather.





C03	Apply knowledge of atmospheric parameters for modelling.
C04	Apply knowledge for the long/short weather prediction.
C05	Apply knowledge for the measurement of Ozone content.
	<b>Subject Code: 02PY0583</b> <b>Subject Name: Analog and Digital Communication</b>
C01	Understand the basics of Analog and digital system
C02	Understand the fundamental of electronic communication system.
C03	Apply the knowledge to various analog and digital modulation and demodulation techniques.
C04	Analyze the most appropriate techniques for the application
	<b>Subject Code: 02PY0584</b> <b>Subject Name: Microwave Communication</b>
C01	Students able to implement mode analysis for different waveguide structure.
C02	Apply knowledge of microwave sources in generating microwave power.
C03	Implement different microwave passive components using Comsol / HFSS simulator.
C04	Apply the knowledge of radar system in sensing the objects.
C05	Apply the knowledge in implementing microwave communication systems.