

2.6.1. Program outcomes, Program specific outcomes and Course outcomes for all programs

PROGRAM OUTCOMES (PO):

The Engineering Undergraduate program by the time of graduation, enables the students by the time of graduation to achieve:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **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.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. **The engineer 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 engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering 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.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long 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)

Civil Engineering

- Graduates will plan, analyze and design various engineering structures that meet specific needs of the society with appropriate considerations for healthy, safe & sustainable life and environment.
- Graduates will apply engineering concepts and manage projects as a member or leader in an ethnic way.

Computer Science Engineering

- Graduates will apply the knowledge of mathematics and computer science engineering to solve complex problems.
- Graduates will apply appropriate techniques, resources and latest computing tool to solve real world problems.

Electronics & Communication Engineering

- Graduates will apply knowledge of mathematics, science and Electronics and Communication engineering fundamentals to identify, analyze and solve complex engineering problems.
- Graduates will select and apply appropriate techniques, resources and software tools for engineering activities.

Electrical & Electronics Engineering

- Graduates will apply the knowledge of electrical engineering to design, analyze and implement solutions for technical challenges in the industry.
- Graduates will apply modern engineering tools to devise innovative and efficient methodology to solve electrical engineering problems.

Mechanical Engineering

- Graduates will apply knowledge and practical skills to solve complex problems in core areas such as thermal, design, manufacturing and industrial engineering.
- Graduates will apply modern tools and techniques to analyze and solve engineering problems.

COURSE OUTCOMES (CO)

Displayed on Website

[Course Outcomes Civil Engineering*](#)

[Course Outcomes Computer Science Engineering*](#)

[Course Outcomes Electronics & Communications Engineering*](#)

[Course Outcomes Electrical & Electronics Engineering*](#)

[Course Outcomes Mechanical Engineering*](#)

*Displayed on Website

Details on how the students and staff are made aware of these

- All Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) are stated and displayed on the Ahalia School of Engineering Website.
- They are also communicated through various means, such as the ASET Newsletter, the Principal's address to students during orientation, classroom distribution by concerned staff, and answer booklets for internal tests.
- These are also prominently displayed on college bulletin boards, course logbooks, and other conference and seminar publications.
- PSOs and Program Educational Objectives (PEOs) are distributed to students during the first semester course registration process.

- Students are also kept up to date on course outcomes through training programmes, classroom discussions, expert lectures, and practical exercises.
- During the PTA meeting, parents are informed about the learning objectives.

CONSOLIDATED LIST OF COURSE OUTCOMES

Department of Civil Engineering

Sl. No	Course Code & Course Name	Course Outcome Number	Course Outcome
1	MA101 Calculus	C101.1	To provide some basic tools which are useful in modelling and analysing physical phenomena.
		C101.2	To analyse the physical phenomena involving continuous change of variables.
		C101.3	To evaluate differential and integral calculus of functions of one or more variables and of vector functions.
		C101.4	To evaluate the areas and volumes using integrals
		C101.5	To analyse the application of vector valued functions
		C101.6	To provide basic training in plotting and visualizing graphs of functions and intuitively understanding their properties
2	PH100 Engineering Physics	C102.1	Compute the quantitative aspects of waves and oscillations in engineering systems.
		C102.2	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments.
		C102.3	Analyse the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.
		C102.4	Apply the knowledge of ultrasonics in non-destructive testing and use the principles of acoustics to explain the nature and characterization of acoustic design and to provide a safe and healthy environment
		C102.5	Apply the comprehended knowledge about laser and fibre optic communication systems in various engineering applications
		C102.6	Using the knowledge of acoustics in designing acoustically important Buildings.
3	BE100 Engineering Mechanics	C103.1	Solve problems dealing with forces and determine the resultant. Also Identify the forces acting on a body and draw the free body diagram
		C103.2	Solve problems on forces acting on a body in space. Also determine the support reactions of beams subjected to concentrated loads and uniformly distributed loads
		C103.3	Determine the centroid and moment of inertia of composite areas.
		C103.4	Analyse the concept of friction to solve problems of bodies placed on rough surfaces and solve problems on support reactions of beams using principle of virtual work.

		C103.5	Use Newton's second law to solve problems on bodies in motion and apply the concept of instantaneous centre to bodies having combined translation and rotation.
		C103.6	Knowledge on types of Vibration and solve problem using the concept of Simple Harmonic Motion
4	BE101-0X Introduction to Civil Engineering	C104.1	The student will be able to explain the importance of Civil Engineering in the infrastructural development of society and they will also be able to plan and set out a building
		C104.2	They will be able to illustrate the types, uses and properties of various building materials likes stones, bricks and tiles
		C104.3	They will be able to impart knowledge on the basic ingredients used for construction including cement, aggregate etc
		C104.4	They will be able to familiarize with the types of masonry used for building construction
		C104.5	They will be able to illustrate the types, uses and properties of various natural and artificial building materials like timber and steel
		C104.6	Students should be able to understand the different components of a building their purposes and method of construction
5	BE103 Introduction to Sustainable Engineering	C105.1	The students should have knowledge about the concept and importance of sustainability
		C105.2	The students should be able to understand different types of pollution and waste generation, their causes, effects and control
		C105.3	The students should be able to understand environmental management standards and environmental impact assessment
		C105.4	The students should be able to understand the concepts of bio mimicking, green engineering, green building, sustainable habitat, sustainable urbanization
		C105.5	Students should have a knowledge of various types of conventional and non-conventional energy sources
		C105.6	Students should be able to understand the role of engineering and technology in sustainable development
6	EE100 Basics of Electrical Engineering	C106.1	Students will be able to acquire fundamental knowledge of Electrical circuits and can solve circuit related problems.
		C106.2	Students will be able to recall and state ideas about magnetic circuits.
		C106.3	Students will be able to explain the fundamentals of AC circuits.
		C106.4	Students will be able to analyse three phase systems.
		C106.5	Students will be able to compare and contrast the various types of renewable energy sources.
		C106.6	Students will be able to identify and differentiate between various AC and DC machines.
7	PH110 Engineering Physics Lab	C107.1	Develop analytical/experimental skills and impart prerequisite hands-on experience for engineering laboratories

		C107.2	Understand the need for precise measurement practices for data recording
		C107.3	Understand the principle, concept, working and applications of relevant technologies and comparison of results with theoretical calculations
		C107.4	Analyse the techniques and skills associated with modern scientific tools such as lasers and fibre optics
		C107.5	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results
		C107.6	To apply the concepts of laser technology in various devices
8	CE 110 Civil Engineering Workshop	C108.1	Student should be able to set out a building using tape
		C108.2	Student should be able to set out a building using cross staff
		C108.3	Student should be able to determine area and mass moment of inertia of
		C108.4	to construct one and a half and two brick walls using English bond
		C108.5	Student should be able to calculate the area and volume of various features of a building
		C108.6	Student should be able to determine the compressive strength of brick and cement mortar cubes using compression testing machine
9	EE 110 Electrical Engineering Workshop	C109.1	Students will be able to recognize supply arrangements and their limitations, standard voltages and their tolerances, safety aspects of electrical systems and importance of protective measures in wiring systems.
		C109.2	Students will identify the types of wires, cables and other accessories used in wiring.
		C109.3	Students should be able to wire up and predict estimate of simple lighting circuits for domestic buildings and distinguish between light and power circuits
		C109.4	Students will be able to measure electrical circuit parameters like current, voltage and power in a circuit.
		C109.5	Students will be able to explain the usage of Multimeters and LCR Q meters
		C109.6	Creating awareness of energy conservation in electrical systems.
10	MA 102 Differential Equations	C110.1	Graduates will be able acquire basic knowledge of homogeneous differential equations and methods of solving them.
		C110.2	Graduates will be able acquire basic knowledge of non-homogeneous differential equations and methods of solving them.
		C110.3	Graduates will be able to apply Fourier series for analysing periodic functions in terms of their frequency components.
		C110.4	Graduates will be able form and solve using partial differential equations

		C110.5	Graduates will be able to Identify, analyse and subsequently solve the distribution of heat problems whose behaviour can be described by differential equations.
		C110.6	Graduates will be able to Identify, analyse and subsequently solve the waves whose behaviour can be described by differential equations.
11	CY100 Engineering Chemistry	C111.1	Understand various spectroscopic techniques like UV-Visible, IR, NMR and its applications.
		C111.2	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields.
		C111.3	Basic knowledge of Thermal analytical techniques and conductivity measurements. Basic knowledge of chromatographic techniques.
		C111.4	Have a scope in the area of material science. Have knowledge of synthesizing nano materials and their application in industry, carbon nano tube technology in every industry now a days.
		C111.5	Have knowledge of chemical properties of fuels. Know the properties of lubricants.
12	BE110 Engineering Graphics	C112.1	Draw the projection of points and lines located in different quadrants
		C112.2	Prepare multiview orthographic projections of objects by visualizing them in different positions
		C112.3	Draw sectional views and develop surfaces of a given object
		C112.4	Prepare pictorial drawings using the principles of isometric and perspective projections to visualise objects in 3 dimensions.
		C112.5	Convert 3D views to orthographic views and vice versa
		C112.6	Obtain multiview projections and solid models of objects using CAD tools
13	BE102 Design & Engineering	C113.1	Graduates will be able to classify and experiment different stages in design with their significance
		C113.2	Aware of the product oriented and user-oriented aspects that make the design a success.
		C113.3	The students will be able to identify & initiate different creative designs.
		C113.4	Enable the students to analyse the prototype models needed for development of project
		C113.5	Graduates will be able to Select the design requirements for designing various products.
		C113.6	The students can evaluate the product based on intellectual property rights
14	ME 100 Basics of Mechanical Engineering	C114.1	Acquire knowledge on fundamental concepts of thermodynamics and laws of thermodynamics.
		C114.2	Use energy conservation devices from the knowledge of the energy conversion device.
		C114.3	Select and use an appropriate refrigeration and air conditioning systems
		C114.4	Develop and implement basic ideas of the different parts, working of automobile and fundamentals of aerodynamics

		C114.5	Preparation and ability to engage in independent and life-long learning in the context of knowledge on engineering materials.
		C114.6	Select and use the different manufacturing methods
15	EC 100 Basics of Electronics Engineering	C115.1	To understand and identify passive components
		C115.2	Student can identify active components and can design, setup simple circuits using diodes
		C115.3	To understand the basics of BJT and detailed study of its characteristics
		C115.4	To understand and detailed study of JFET&MOSFET
		C115.5	To understand the working of rectifier
		C115.6	Voltage and currents can be measured and monitored using electronic measuring instruments
16	CY110 Engineering Chemistry Lab	C116.1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses
		C116.2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs
		C116.3	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR spectra of some organic compounds
		C116.4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis
		C116.5	Learn to design and carry out scientific experiments as well as accurately record and analyse the results of such experiments
		C116.6	Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social, economic and environmental problems and why it is an integral part of curriculum
17	ME 110 Mechanical Engineering Workshop	C117.1	Knowledge achieved to explain the various manufacturing process in the basic mechanical engineering workshop sections- smithy, carpentry, assembling, welding etc.
		C117.2	Identify the various hand tools used in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc.
		C117.3	Able to choose different measuring devises according to the work.
		C117.4	Ability to name and summarize the operations of various machine tools like lathe, milling, drilling and shaping machines.
		C117.5	Knowledge achieved to disassemble and assemble the machines like IC engines.
		C117.6	Skill achieved to construct models by using basic mechanical workshop sections like welding, moulding, smithy, carpentry etc.
18		C118.1	Graduates will be able to recognize the appropriate methods to solve electronics and communication problems.
		C118.2	Graduates will be able to acquire basic training and skills to solve basic electronics problems.

	EC 110 Electronics Engineering Workshop	C118.3	Graduates will be able to apply the equations and formulas to solve related practical value problems.
		C118.4	Graduates will be able to calculate the problems in Diodes, biasing of transistor, amplifiers, oscillators and regulator circuits.
		C118.5	Graduates will be able to evaluate communication systems like RADAR, GPS, Entertainment Electronics
		C118.6	Graduates will be able to measure current voltage values using equipment and to analyse a waveform
19	MA201 Linear Algebra & Complex Analysis	C201.1	Graduates will be able to identify the analytic functions and harmonic functions.
		C201.2	Graduates will be able to understand the conformal mappings and to find regions that are mapped under certain Transformations
		C201.3	Graduates will be able to evaluate the complex integrals
		C201.4	Graduates will be able to evaluate the complex integrals as an applications of residue theorems
		C201.5	Graduates will be able to understand the concept of vector space, to solve the system of linear equations.
		C201.6	Graduates will be able to and to evaluate the Eigen value, Eigen vectors of a matrix and diagonalize a matrix.
20	CE201 Mechanics of Solids	C202.1	Acquire knowledge about simple stresses and strains and the various elastic constants
		C202.2	Get a knowledge about deformation of solids and about strain energy
		C202.3	Calculate internal forces in members subject to axial loads, shear and bending and plot their distributions
		C202.4	Gain knowledge in theory of simple bending and shear stresses
		C202.5	Transform the state of stress at a point and determine the principal and maximum shear stresses using equations as well as the Mohr's circle and also understand torsion of shafts and springs
		C202.6	Find the slope and deflection of beams and also understand column buckling and calculate critical load and stress
21	CE203 Fluid Mechanics I	C203.1	Understand the basics of fluid flow and pressure in fluids at rest and analyse the condition of stability of a body in a fluid based on relative positions of its centre of buoyancy and metacentre
		C203.2	Describe the kinematics of fluids based on stream function and velocity potential function
		C203.3	Apply Bernoulli's equation to fluid flow problems involving venturi meter, orifice meter, pitot tube and application of momentum principle
		C203.4	Apply Bernoulli's equation to fluid flow problems involving orifices, mouthpieces, notches and weirs
		C203.5	Analyse the flow through pipes and the major and minor energy losses
		C203.6	Understand the concept of development of boundary layer over a long thin plate
22	CE205 Engineering Geology	C204.1	To understand the concept of engineering geology and weathering processes.
		C204.2	To explain the concepts of subsurface water and its engineering significance.

		C204.3	To understand the physical properties and chemical composition of minerals and also to interpret earthquakes in relation to internal structure of the earth.
		C204.4	To identify common rocks based on their physical properties.
		C204.5	To describe the attitude of geological structures and instruments used.
		C204.6	To understand various natural hazards and its mitigation methods.
23	CE207 Surveying	C205.1	Student should be able to understand the basic concepts of conventional surveying including chain, compass and plane table surveying
		C205.2	Student should be able determine the heights of different surfaces and various concepts of contouring.
		C205.3	Should be able to determine earthwork excavation, prepare mass diagrams and understand the basics of theodolite surveying
		C205.4	Students should understand the importance of Triangulation and their applications in surveying
		C205.5	Students should be able to determine the Most Probable Values for various observations
		C205.6	Student should be able understand the basic concepts of astronomical surveying and develop the knowledge of advanced surveying methods including EDM's and Total Station
24	HS210 Life Skills	C206.1	knowledge about concept and importance of sustainability
		C206.2	understand about different types of pollution and waste generation, their causes effects and control
		C206.3	understand environmental management standards and environmental impact assessment
		C206.4	understand the concept of bio mimicking, green Engineering and green building
		C206.5	knowledge about various types of conventional and non-conventional energy sources
		C206.6	understand the role of engineering and technology in sustainable development
25	CE231 Civil Engineering Drafting Lab	C207.1	Student should be able to set out a building using tape
		C207.2	Student should be able to set out a building using cross staff
		C207.3	Student should be able to determine area and mass moment of inertia of
		C207.4	to construct one and a half and two brick walls using English bond
		C207.5	Student should be able to calculate the area and volume of various features o f a building
		C207.6	Student should be able to determine the compressive strength of brick and cement mortar cubes using compression testing machine
26	CE233 Surveying Lab	C208.1	The student shall be able to understand the concept of open traverse surveying and apply the same on the fields.
		C208.2	The student shall be able to understand the concept of Levelling and apply it to find elevations of different points in the field by Collimation Method or Rise and Fall Method.
		C208.3	The student shall be able to determine the angles by Method of Reiteration using Theodolite.

		C208.4	The student shall be able to determine the angles by Method of Repetition using Theodolite.
		C208.5	The student shall be able to understand the meaning of slope distance, horizontal distance and vertical height and its measurement using a Total Station Instrument.
		C208.6	The student shall be able to use resection or method of coordinate for the measurement of area using a Total Station Instrument.
27	MA202 Probability Distributions, Transforms and Numerical Methods	C209.1	Graduates will have a concept of discrete probability density functions
		C209.2	Graduates will have a concept of continuous probability density functions
		C209.3	Graduates will get an idea about the Laplace transforms and will be able to apply them in their engineering branches
		C209.4	Graduates will get an idea about the Fourier transforms and will be able to apply them in their engineering branches
		C209.5	Graduates will have a concept of numerical methods for iteration and interpolation and their applications in solving Engineering problems
		C209.6	Graduates will have a concept of numerical methods to solve system of linear equations and numerical integration, and their applications in solving Engineering problems
28	CE202 Structural Analysis I	C210.1	Analyse trusses and understand displacement response of statically determinate structural systems using energy methods
		C210.2	Understand the application of unit load method and strain energy method for determination of deflection of statically determinate beams, frames & pin jointed trusses
		C210.3	Analyse statically indeterminate structures using strain energy method and method of consistent deformation
		C210.4	Gain knowledge about moving loads and influence lines
		C210.5	Gain knowledge about statically determinate suspension bridges and arches
		C210.6	Gain knowledge about statically indeterminate suspension bridges and arches
29	CE204 Construction Technology	C211.1	Students will be able to understand construction materials, their components and manufacturing processes.
		C211.2	Students will be able to know the properties of concrete and different mix design methods
		C211.3	Students will be able to understand details regarding the building construction and masonry domestic buildings.
		C211.4	Students will be able to define the details regarding the components of building
		C211.5	The students will be able to define and describe the concepts of design material of tall framed load bearing building and servicing
		C211.6	Students will be able to know the failures of structures and reasons.
30	CE206 Fluid Mechanics II	C212.1	The students become able to analyse the hydraulic turbines
		C212.2	The students become able to understand the working of hydraulic pumps

		C212.3	They become capable of analysing open channel flows & designing open channels
		C212.4	The students become capable of computation of critical flow and analysis of hydraulic jump
		C212.5	Students become able to analyse surface profiles and gradually varied flow
		C212.6	Students will be able to understand the concept of dimensional analysis and model analysis
31	CE208 Geotechnical Engineering I	C213.1	The students will be able to understand the basic principles governing soil behaviour
		C213.2	Students can identify the soil based on gradation and different consistency limits
		C213.3	Students will be able to calculate total and effective stress with a knowledge of pore water, also the permeability characteristics of different soils
		C213.4	Students can acquire knowledge in different soil tests and will be able to draw the Mohr circle
		C213.5	Gain knowledge in consolidation and practical applications of consolidation
		C213.6	Students get an idea on slopes, its failures and compaction characteristics of soil
32	HS200 Business Economics	C214.1	knowledge about concept and importance of sustainability
		C214.2	understand about different types of pollution and waste generation, their causes effects and control
		C214.3	understand environmental management standards and environmental impact assessment
		C214.4	understand the concept of bio mimicking, green Engineering and green building
		C214.5	knowledge about various types of conventional and non-conventional energy sources
		C214.6	understand the role of engineering and technology in sustainable development
33	CE232 Materials Testing Lab I	C215.1	To determine the Modulus of Elasticity of steel and wood using UTM
		C215.2	To verify Clerk- Maxwell's Reciprocal Theorem and hence determine the Modulus of elasticity of steel.
		C215.3	To determine the Modulus of rigidity of steel using torsion test, spring test and torsion pendulum
		C215.4	To analyse the toughness of a specimen using Impact testing machine
		C215.5	To test the hardness of a material by Rockwell, Brinell and Vickers Hardness test.
		C215.6	To determine the ultimate shear stress of steel using UTM
34	CE234 Fluid Mechanics Lab	C216.1	Students will be able to understand the different flow measurement equipment and their procedures.
		C216.2	Students will be able to analyse the performance characteristics pumps
		C216.3	Graduates will be able to develop the skill of experimentation techniques for the study of flow phenomena in pipes
		C216.4	Students will be able to analyse the performance characteristics turbines
		C216.5	Graduates will be able to develop the skill of experimentation techniques for the study of flow phenomena in channels

		C216.6	Students will be able to compute the hydraulic coefficients of orifices and mouth pieces under constant head method and time of emptying method.
35	CE301 Design of Concrete Structures I	C301.1	Students will be able to apply the fundamental concepts of WSM and LSM.
		C301.2	Students will be able to use IS code of practice for the design of concrete elements.
		C301.3	Students will be able to design various beam elements of reinforced concrete structures by LSD.
		C301.4	The students will get knowledge about basic design of RC slabs by LSD
		C301.5	The students should be able to design reinforced concrete slabs for shear and torsion by LSD and draw the reinforcement details
		C301.6	The students should be able to design reinforced concrete staircases and various types of columns.
36	CE303 Structural Analysis II	C302.1	Analyse structures using three moment theorems
		C302.2	Analyse structures using slope deflection method
		C302.3	Analyse structures using moment distribution method
		C302.4	Analyse structures using Kane's method
		C302.5	Analyse curved beams in plan
		C302.6	Analyse structures using plastic theory
37	CE305 Geotechnical Engineering II	C303.1	The students will be able to learn stress formation in soil due to point load along with Newmark's chart
		C303.2	Students can calculate lateral earth pressures using different methods
		C303.3	Students will be able to calculate ultimate, safe and allowable bearing capacity of shallow foundations and can understand different shear failures
		C303.4	Students can do the design of combined footings and raft foundations with a knowledge in bearing capacity
		C303.5	Gain knowledge in different piles and role of pile foundations in soil mechanics
		C303.6	Students get an idea on machine foundations and the importance in site investigations using different methods of boring
38	CE307 Geomatics	C304.1	To select proper method for balancing the traverse by understanding traversing, and its various methods.
		C304.2	To distinguish between different types of curves and choose the appropriate one by comprehending basics of curves.
		C304.3	Describe the fundamental theory and concepts of the Global Positioning System
		C304.4	Summarize the GPS surveying methods
		C304.5	Explain the fundamental principles of Remote sensing
		C304.6	To apply and arrive at solutions for various civil engineering aspects using Geographical Information System (GIS) tool.

39	CE309 Water Resources Engineering	C305.1	The students will be able to understand the hydrologic cycle and the mechanism of precipitation, infiltration and their measurement.
		C305.2	The students will be able to compute the amount of runoff generated during a storm using hydrograph analysis
		C305.3	The students will be able to determine the water requirement of crops and irrigation efficiencies.
		C305.4	The students will be able to understand the different stream flow measurement techniques and river training works
		C305.5	The students will be able to understand reservoir planning and compute useful life of a reservoir.
		C305.6	The students will be able to understand the distribution and storage of groundwater and apply the knowledge in their extraction.
40	CE 361 Advanced Concrete Technology	C306A.1	Students will be able to understand the testing of different ingredients of concrete- cement, aggregates as per IS code.
		C306A.2	Students will be able to decide the type of admixtures to be used for concreting based on its properties
		C306A.3	Students will be able to design the concrete mix using ACI and IS code methods
		C306A.4	Students will be able to determine the properties of fresh and hardened of concrete
		C306A.5	Students will be able to determine different properties of concrete by applying non-destructive testing of concrete and also explain the factors affecting durability of concrete
		C306A.6	Students will be able to recommend special concretes depending on their specific applications and special processes and technology for particular types of structure
41	CE 363 Geotechnical Investigation	C306B.1	Students will understand the importance of soil exploration programs.
		C306B.2	Understand different methods of soil exploration and also know the application of plate load test
		C306B.3	Identification of various engineering and index properties of soil using standard penetration test and cone penetration test
		C306B.4	the students will able to apply knowledge of geophysical methods to know the type and properties of soil strata
		C306B.5	Understand different types of samplers and methods of sampling
		C306B.6	Students will be able to determine the properties of rock samples and also determination of load carrying capacity of pile.
42	CE341 Design Project	C307.1	The students will be able to understand the engineering aspects of design with reference to simple products
		C307.2	The students will be able to foster innovation in design of products, processes and systems
		C307.3	The students will be able to develop design that add value to products and solve technical problems
		C307.4	The students will be able to study and present new products in a teamwork
		C307.5	The students will be able to think innovatively about different technologies used in engineering field

		C307.6	The students will be able to study and analyse different problems related to engineering field
43	CE331 Materials Testing Lab II	C308.1	Estimate the various properties of fine and coarse aggregate
		C308.2	Determine strength properties of cement
		C308.3	The students will develop the ability to use the IS codes for the Specification and characteristic study of materials used in the concrete.
		C308.4	Find the fresh and hardened concrete properties
		C308.5	Judge the strength of concrete
		C308.6	Determine the strength of different types of tiles
44	CE333 Geotechnical Engineering Lab	C309.1	Students have thorough knowledge about the procedures of laboratory tests
		C309.2	To determine the physical, index and engineering properties of soils
		C309.3	The students will have the capability to classify soils and behaviour based on test results
		C309.4	They will be able to evaluate the permeability and shear strength of soils
		C309.5	Students will be able to evaluate settlement characteristics of soils
		C309.6	They will be able to evaluate compaction characteristics required for field application
45	CE302 Design of Hydraulic Structures	C310.1	Design of irrigation structures like diversion head works
		C310.2	Design of irrigation canals and introduction to regulators and cross drainage works
		C310.3	Design and drawing of minor irrigation structures such as regulators, cross drainage works and canal falls
		C310.4	Perform the stability analysis of gravity dams
		C310.5	Explain the causes of failure of different types of dams and their design criteria
46	CE304 Design of Concrete Structures II	C311.1	Students will be able to design various types of columns using SP 16.
		C311.2	To get knowledge about types of foundations, principles of Combined footings and design of isolated footing.
		C311.3	Students will be able to design and detail cantilever retaining wall and understand the design principles of Counter fort retaining wall.
		C311.4	The students will be able to design and detail circular slabs and domes.
		C311.5	The students will be able to design rectangular and circular water tanks using IS code.
		C311.6	The students gain knowledge of prestressed concrete fundamentals and analyse pre and post tensioned beams.
47	CE306 Computer Programming and Computational Techniques	C312.1	Students will be able to define the numerical techniques for finding solutions of Transcendental equations and interpolations
		C312.2	Students will be able to describe and analyse functional approximations, numerical integration and solution of simultaneous linear algebraic equations

		C312.3	Students will have a fundamental idea about C++ concept, keywords, identifiers, data types, constants and variables, operators and structures of C++
		C312.4	Students will be able to develop the programs for evaluation of factorial of a number, infinite series, sorting, searching and matrix manipulations
		C312.5	Students will be able to write the programs to solve simple engineering programs using function call by value and function call by reference
		C312.6	Students will be able to write the C++ programs to solve simple engineering programs using Class, objects and concepts like inheritance
48	CE308 Transportation Engineering I	C313.1	The students will be able to conduct Engineering Surveys for highway alignment and design cross sectional elements
		C313.2	The students will be able to design various geometric elements of a highway
		C313.3	Students will be able to determine the characteristics of pavement materials and design flexible pavements
		C313.4	Students will be able to identify the various types and causes of failure in flexible and rigid pavements and conduct traffic engineering studies and analyse data for efficient management of roadway facilities
		C313.5	Students will be able to design various traffic control devices and understand types of intersections and the planning of airports.
		C313.6	Students will be able to design basic airport facilities
49	HS300 Principles of Management	C314.1	To recall and identify the relevance of management concepts
		C314.2	To describe, discuss and relate management techniques adopted within an organization
		C314.3	To apply management techniques for meeting current and future management challenges faced by the organization
		C314.4	To compare the management theories and models critically and to inspect and question its validity in the real world
		C314.5	To assess and modify different theories of management so as to relate it to current management challenges
		C314.6	To apply principles of management in order to execute the role as a manager
50	CE 362 Ground Improvement Techniques	C315.1	An understanding about types of ground improvement techniques and soil distribution in India
		C315.2	Knowledge about various types of grouts and their applications
		C315.3	Knowledge about types of chemical stabilization and their construction method
		C315.4	Understanding about Ground Anchors, Rock Bolts and Soil Nailing
		C315.5	Knowledge about Compaction of soil
		C315.6	Understanding about various methods of dewatering of soil
51		C316.1	Students should be able to find different properties of Bitumen

	CE332 Transportation Engineering Lab	C316.2	Students should be able to select the aggregates to be used in pavement by conducting various tests
		C316.3	Students shall be able to find the strength of given soil sample by conducting CBR test
		C316.4	students will be able to find the binding strength of bitumen
		C316.5	Students will be able to determine the properties of aggregates
		C316.6	Students should be able to determine the specific gravity of soil
52	CE334 Computer Aided Civil Engineering Lab	C317.1	Students able to express the concept of CAD/CAM/CIM and Other terminologies used in the development and manufacturing of a product.
		C317.2	Students able to demonstrate different methods for geometric modelling in CAD.
		C317.3	Students able to evaluate the types of curves used in creating a geometry.
		C317.4	Students able to demonstrate different solid modelling representations used in CAD.
		C317.5	Students able to formulate stiffness matrix to analyse structural and thermal problems
53	CE352 Comprehensive Exam	C317.6	Students analyse structural finite element problems by getting knowledge about various finite element methods.
		C318.1	The student will be confident in analysing the fundamental aspects of structural engineering problem/situation
		C318.2	The student will be confident in understanding the fundamental aspects of fluid mechanics problem/situation
		C318.3	The student will be confident in discussing the fundamental aspects of concrete technology problem/situation
		C318.4	The student will be confident in describing the fundamental aspects of transportation engineering problem/situation
54	CE401 Design of Steel Structures	C318.5	The student will be confident in understanding the fundamental aspects of basic civil engineering problem/situation
		C401.1	Students will be able to design bolted and welded connections
		C401.2	To get knowledge about design tension members and beams using the IS specifications
		C401.3	Students will be able to design columns under axial loads using IS specifications
		C401.4	The students will be able design beams and plate girders
55	CE403 Structural Analysis III	C401.5	To get knowledge about to assess loads on truss and design purlins.
		C401.6	The students gain knowledge of design structural components using timber.
		C402.1	To analyse multi-storied frames using approximate methods
		C402.2	To understand the fundamentals of indeterminacies, flexibility and stiffness of structures
		C402.3	To analyse trusses, continuous beams and rigid frames using flexibility method
		C402.4	To analyse trusses, continuous beams and rigid frames by stiffness method
		C402.5	To analyse continuous beams and rigid frames by direct stiffness method

		C402.6	To understand the basic concepts of structural dynamics
56	CE405 Environmental Engineering I	C403.1	To understand basic principles of water supply engineering & to estimate water demand using population forecasting method
		C403.2	students will become aware of various pollutants affecting water quality
		C403.3	students will know about the different units available in a water treatment plant & design of sedimentation tank
		C403.4	The students will become aware of various filters & design of rapid sand filter
		C403.5	Get the idea about disinfectant, hardness removing methods & miscellaneous methods
		C403.6	Students should be able to understand and design distribution networks in water
57	CE407 Transportation Engineering II	C404.1	Students will be able to compare different modes of transportation and alignment of railway
		C404.2	Students will be able to explain the geometric parameters and component of railway track
		C404.3	Students will be able to understand the operations and controlling systems in railways
		C404.4	Students will be able to know the track maintenance and accident control methods
		C404.5	Students will be able to study the setting out and construction of tunnels
		C404.6	Students will be able to illustrate the functions and components of harbours and docks
58	CE409 Quantity Surveying and Valuation	C405.1	Students will be able to identify the quality and quantity of materials, quantity and classes of skilled and unskilled labours and tools and plants required for the project.
		C405.2	Students will be able to analyse the rate of items of work by working out the quantities of different materials and labours required for execution of various items of work.
		C405.3	Students will be able to estimate the quantities, prepare abstract for various items of works- buildings, septic tanks, culverts, roads etc. by drawing up specifications, bar bending schedule and also prepare the schedule of programming of the project
		C405.4	Students will be able to evaluate the value of real and landed property and rent of lease hold property
59	CE 467 Highway Pavement Design	C406.1	Students will understand the basic principles of waste water engineering, design and construction & create awareness about sewer
		C406.2	understand various sewer appurtenances & characteristics of sewage
		C406.3	to get idea about waste water disposal & various treatment units
		C406.4	to create awareness on secondary treatment system
		C406.5	to create awareness on septic tank & working of various treatment units
		C406.6	To create awareness on various sludge treatment methods & sludge disposal.
60	CE451 Seminar & Project Preliminary	C407.1	Students should analyse a current topic of professional interest and present in before audience
		C407.2	Students should identify an engineering problem, analyse it and propose a work plan to solve it

		C407.3	Students should make models to solve a particular problem
		C407.4	Students should be able to communicate effectively about the current methods or techniques in the field of civil engineering
		C407.5	They must be able to adapt to the recent innovations in the field of civil engineering
		C407.6	Students should have the ability to convince public with their innovations
61	CE431 Environmental Engineering Lab	C408.1	Students will be able to analyse dissolved oxygen content in water
		C408.2	Students will be able to determine the biochemical oxygen demand in water
		C408.3	The students will be able to analyse the chemical characteristics of a given water sample viz. pH, acidity, alkalinity
		C408.4	The students will be able to analyse the physical characteristics of a given water sample viz. colour, turbidity & conductivity
		C408.5	The students will be able to determine the optimum dosage of alum using jar test
		C408.6	To estimate the chemical characteristics of a given water sample viz. chlorides, iron, available chlorine & sulphates content to assess its suitability for drinking purpose
62	CE402 Environmental Engineering II	C409.1	Students will understand the basic principles of waste water engineering, design and construction & create awareness about sewer
		C409.2	understand various sewer appurtenances & characteristics of sewage
		C409.3	to get idea about waste water disposal & various treatment units
		C409.4	to create awareness on secondary treatment system
		C409.5	to create awareness on septic tank & working of various treatment units
		C409.6	To create awareness on various sludge treatment methods & sludge disposal.
63	CE404 Civil Engineering Project Management	C410.1	Students will be able to plan and schedule a construction project
		C410.2	Students will be able to select an appropriate construction equipment for a specific job
		C410.3	Students will be able to familiarize the legal procedures in construction contracts.
		C410.4	Students will be able to formulate suitable quality Management plan for construction
		C410.5	The students will be able to familiarize the safety practices and procedures.
		C410.6	The students will be able to apply principles of ethics in decision making.
64	CE 474 Municipal Solid Waste Management	C411.1	The student will be able to know the different sources and characteristics of wastes
		C411.2	Students will understand the factors affecting waste generation, rates
		C411.3	The students will get the knowledge on waste collection methods and services
		C411.4	Students will be able to know the different processing techniques of wastes

		C411.5	To get a knowledge on disposal of solid waste
		C411.6	To know the different composting techniques
65	IE 488 Total Quality Management	C412.1	To recall and identify the relevance of management concepts
		C412.2	To describe, discuss and relate management techniques adopted within an organization
		C412.3	To apply management techniques for meeting current and future management challenges faced by the organization
		C412.4	To compare the management theories and models critically and to inspect and question its validity in the real world
		C412.5	To assess and modify different theories of management so as to relate it to current management challenges
		C412.6	To apply principles of management in order to execute the role as a manager
66	CE492 Project	C413.1	Students should identify an engineering problem, analyse it and propose a work plan to solve it
		C413.2	Students should have the ability to convince others with their innovations in civil engineering
		C413.3	They must be able to adapt to the recent innovations in the field of civil engineering
		C413.4	Students should make models to solve a particular problem
		C413.5	They must be able to undertake a problem, find solutions and should try to implement
		C413.6	They must have a technical knowledge in their selected area

CONSOLIDATED LIST OF COURSE OUTCOMES

Department of Computer Science Engineering

Sl. No	Course Code & Course Name	Course Outcome Number	Course Outcome
1	MA101 Calculus	C101.1	To provide some basic tools which are useful in modelling and analysing physical phenomena.
		C101.2	To analyse the physical phenomena involving continuous change of variables.
		C101.3	To evaluate differential and integral calculus of functions of one or more variables and of vector functions.
		C101.4	To evaluate the areas and volumes using integrals
		C101.5	To analyse the application of vector valued functions
		C101.6	To provide basic training in plotting and visualizing graphs of functions and intuitively understanding their properties
2	PH100 Engineering Physics	C102.1	Compute the quantitative aspects of waves and oscillations in engineering systems.
		C102.2	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments.
		C102.3	Analyse the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.
		C102.4	Apply the knowledge of ultrasonics in non-destructive testing and use the principles of acoustics to explain the nature and characterization of acoustic design and to provide a safe and healthy environment
		C102.5	Apply the comprehended knowledge about laser and fibre optic communication systems in various engineering applications
		C102.6	Using the knowledge of acoustics in designing acoustically important Buildings.
3	BE100 Engineering Mechanics	C103.1	Solve problems dealing with forces and determine the resultant. Also Identify the forces acting on a body and draw the free body diagram
		C103.2	Solve problems on forces acting on a body in space. Also determine the support reactions of beams subjected to concentrated loads and uniformly distributed loads
		C103.3	Determine the centroid and moment of inertia of composite areas.
		C103.4	Analyse the concept of friction to solve problems of bodies placed on rough surfaces and solve problems on support reactions of beams using principle of virtual work.

		C103.5	Use Newton's second law to solve problems on bodies in motion and apply the concept of instantaneous centre to bodies having combined translation and rotation.
		C103.6	Knowledge on types of Vibration and solve problem using the concept of Simple Harmonic Motion
4	BE101-0X Introduction to Civil Engineering	C104.1	The student will be able to explain the importance of Civil Engineering in the infrastructural development of society and they will also be able to plan and set out a building
		C104.2	They will be able to illustrate the types, uses and properties of various building materials likes stones, bricks and tiles
		C104.3	They will be able to impart knowledge on the basic ingredients used for construction including cement, aggregate etc
		C104.4	They will be able to familiarize with the types of masonry used for building construction
		C104.5	They will be able to illustrate the types, uses and properties of various natural and artificial building materials like timber and steel
		C104.6	Students should be able to understand the different components of a building their purposes and method of construction
5	BE103 Introduction to Sustainable Engineering	C105.1	The students should have knowledge about the concept and importance of sustainability
		C105.2	The students should be able to understand different types of pollution and waste generation, their causes, effects and control
		C105.3	The students should be able to understand environmental management standards and environmental impact assessment
		C105.4	The students should be able to understand the concepts of bio mimicking, green engineering, green building, sustainable habitat, sustainable urbanization
		C105.5	Students should have a knowledge of various types of conventional and non-conventional energy sources
		C105.6	Students should be able to understand the role of engineering and technology in sustainable development
6	EE100 Basics of Electrical Engineering	C106.1	Students will be able to acquire fundamental knowledge of Electrical circuits and can solve circuit related problems.
		C106.2	Students will be able to recall and state ideas about magnetic circuits.
		C106.3	Students will be able to explain the fundamentals of AC circuits.
		C106.4	Students will be able to analyse three phase systems.
		C106.5	Students will be able to compare and contrast the various types of renewable energy sources.
		C106.6	Students will be able to identify and differentiate between various AC and DC machines.
7	PH110 Engineering Physics Lab	C107.1	Develop analytical/experimental skills and impart prerequisite hands-on experience for engineering laboratories

		C107.2	Understand the need for precise measurement practices for data recording
		C107.3	Understand the principle, concept, working and applications of relevant technologies and comparison of results with theoretical calculations
		C107.4	Analyse the techniques and skills associated with modern scientific tools such as lasers and fibre optics
		C107.5	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results
		C107.6	To apply the concepts of laser technology in various devices
8	CE 110 Civil Engineering Workshop	C108.1	Student should be able to set out a building using tape
		C108.2	Student should be able to set out a building using cross staff
		C108.3	Student should be able to determine area and mass moment of inertia of
		C108.4	to construct one and a half and two brick walls using English bond
		C108.5	Student should be able to calculate the area and volume of various features of a building
		C108.6	Student should be able to determine the compressive strength of brick and cement mortar cubes using compression testing machine
9	EE 110 Electrical Engineering Workshop	C109.1	Students will be able to recognize supply arrangements and their limitations, standard voltages and their tolerances, safety aspects of electrical systems and importance of protective measures in wiring systems.
		C109.2	Students will identify the types of wires, cables and other accessories used in wiring.
		C109.3	Students should be able to wire up and predict estimate of simple lighting circuits for domestic buildings and distinguish between light and power circuits
		C109.4	Students will be able to measure electrical circuit parameters like current, voltage and power in a circuit.
		C109.5	Students will be able to explain the usage of Multimeters and LCR Q meters
		C109.6	Creating awareness of energy conservation in electrical systems.
10	MA 102 Differential Equations	C110.1	Graduates will be able acquire basic knowledge of homogeneous differential equations and methods of solving them.
		C110.2	Graduates will be able acquire basic knowledge of non-homogeneous differential equations and methods of solving them.
		C110.3	Graduates will be able to apply Fourier series for analysing periodic functions in terms of their frequency components.
		C110.4	Graduates will be able form and solve using partial differential equations

		C110.5	Graduates will be able to Identify, analyse and subsequently solve the distribution of heat problems whose behaviour can be described by differential equations.
		C110.6	Graduates will be able to Identify, analyse and subsequently solve the waves whose behaviour can be described by differential equations.
11	CY100 Engineering Chemistry	C111.1	Understand various spectroscopic techniques like UV-Visible, IR, NMR and its applications.
		C111.2	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields.
		C111.3	Basic knowledge of Thermal analytical techniques and conductivity measurements. Basic knowledge of chromatographic techniques.
		C111.4	Have a scope in the area of material science. Have knowledge of synthesizing nano materials and their application in industry, carbon nano tube technology in every industry now a days.
		C111.5	Have knowledge of chemical properties of fuels. Know the properties of lubricants.
12	BE110 Engineering Graphics	C112.1	Draw the projection of points and lines located in different quadrants
		C112.2	Prepare multiview orthographic projections of objects by visualizing them in different positions
		C112.3	Draw sectional views and develop surfaces of a given object
		C112.4	Prepare pictorial drawings using the principles of isometric and perspective projections to visualise objects in 3 dimensions.
		C112.5	Convert 3D views to orthographic views and vice versa
		C112.6	Obtain multiview projections and solid models of objects using CAD tools
13	BE102 Design & Engineering	C113.1	Graduates will be able to classify and experiment different stages in design with their significance
		C113.2	Aware of the product oriented and user-oriented aspects that make the design a success.
		C113.3	The students will be able to identify & initiate different creative designs.
		C113.4	Enable the students to analyse the prototype models needed for development of project
		C113.5	Graduates will be able to Select the design requirements for designing various products.
		C113.6	The students can evaluate the product based on intellectual property rights
14	ME 100 Basics of Mechanical Engineering	C114.1	Acquire knowledge on fundamental concepts of thermodynamics and laws of thermodynamics.
		C114.2	Use energy conservation devices from the knowledge of the energy conversion device.
		C114.3	Select and use an appropriate refrigeration and air conditioning systems
		C114.4	Develop and implement basic ideas of the different parts, working of automobile and fundamentals of aerodynamics

		C114.5	Preparation and ability to engage in independent and life-long learning in the context of knowledge on engineering materials.
		C114.6	Select and use the different manufacturing methods
15	EC 100 Basics of Electronics Engineering	C115.1	To understand and identify passive components
		C115.2	Student can identify active components and can design, setup simple circuits using diodes
		C115.3	To understand the basics of BJT and detailed study of its characteristics
		C115.4	To understand and detailed study of JFET&MOSFET
		C115.5	To understand the working of rectifier
		C115.6	Voltage and currents can be measured and monitored using electronic measuring instruments
16	CY110 Engineering Chemistry Lab	C116.1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses
		C116.2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs
		C116.3	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR spectra of some organic compounds
		C116.4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis
		C116.5	Learn to design and carry out scientific experiments as well as accurately record and analyse the results of such experiments
		C116.6	Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social, economic and environmental problems and why it is an integral part of curriculum
17	ME 110 Mechanical Engineering Workshop	C117.1	Knowledge achieved to explain the various manufacturing process in the basic mechanical engineering workshop sections- smithy, carpentry, assembling, welding etc.
		C117.2	Identify the various hand tools used in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc.
		C117.3	Able to choose different measuring devises according to the work.
		C117.4	Ability to name and summarize the operations of various machine tools like lathe, milling, drilling and shaping machines.
		C117.5	Knowledge achieved to disassemble and assemble the machines like IC engines.
		C117.6	Skill achieved to construct models by using basic mechanical workshop sections like welding, moulding, smithy, carpentry etc.
18		C118.1	Graduates will be able to recognize the appropriate methods to solve electronics and communication problems.
		C118.2	Graduates will be able to acquire basic training and skills to solve basic electronics problems.

	EC 110 Electronics Engineering Workshop	C118.3	Graduates will be able to apply the equations and formulas to solve related practical value problems.
		C118.4	Graduates will be able to calculate the problems in Diodes, biasing of transistor, amplifiers, oscillators and regulator circuits.
		C118.5	Graduates will be able to evaluate communication systems like RADAR, GPS, Entertainment Electronics
		C118.6	Graduates will be able to measure current voltage values using equipment and to analyse a waveform
19	MA201 Linear Algebra & Complex Analysis	C201.1	Graduates will be able to identify the analytic functions and harmonic functions.
		C201.2	Graduates will be able to understand the conformal mappings and to find regions that are mapped under certain Transformations
		C201.3	Graduates will be able to evaluate the complex integrals
		C201.4	Graduates will be able to evaluate the complex integrals as an applications of residue theorems
		C201.5	Graduates will be able to understand the concept of vector space, to solve the system of linear equations.
		C201.6	Graduates will be able to and to evaluate the Eigen value, Eigen vectors of a matrix and diagonalize a matrix.
20	CE201 Mechanics of Solids	C202.1	Acquire knowledge about simple stresses and strains and the various elastic constants
		C202.2	Get a knowledge about deformation of solids and about strain energy
		C202.3	Calculate internal forces in members subject to axial loads, shear and bending and plot their distributions
		C202.4	Gain knowledge in theory of simple bending and shear stresses
		C202.5	Transform the state of stress at a point and determine the principal and maximum shear stresses using equations as well as the Mohr's circle and also understand torsion of shafts and springs
		C202.6	Find the slope and deflection of beams and also understand column buckling and calculate critical load and stress
21	CE203 Fluid Mechanics I	C203.1	Understand the basics of fluid flow and pressure in fluids at rest and analyse the condition of stability of a body in a fluid based on relative positions of its centre of buoyancy and metacentre
		C203.2	Describe the kinematics of fluids based on stream function and velocity potential function
		C203.3	Apply Bernoulli's equation to fluid flow problems involving venturi meter, orifice meter, pitot tube and application of momentum principle
		C203.4	Apply Bernoulli's equation to fluid flow problems involving orifices, mouthpieces, notches and weirs
		C203.5	Analyse the flow through pipes and the major and minor energy losses
		C203.6	Understand the concept of development of boundary layer over a long thin plate
22	CE205 Engineering Geology	C204.1	To understand the concept of engineering geology and weathering processes.
		C204.2	To explain the concepts of subsurface water and its engineering significance.

		C204.3	To understand the physical properties and chemical composition of minerals and also to interpret earthquakes in relation to internal structure of the earth.
		C204.4	To identify common rocks based on their physical properties.
		C204.5	To describe the attitude of geological structures and instruments used.
		C204.6	To understand various natural hazards and its mitigation methods.
23	CE207 Surveying	C205.1	Student should be able to understand the basic concepts of conventional surveying including chain, compass and plane table surveying
		C205.2	Student should be able determine the heights of different surfaces and various concepts of contouring.
		C205.3	Should be able to determine earthwork excavation, prepare mass diagrams and understand the basics of theodolite surveying
		C205.4	Students should understand the importance of Triangulation and their applications in surveying
		C205.5	Students should be able to determine the Most Probable Values for various observations
		C205.6	Student should be able understand the basic concepts of astronomical surveying and develop the knowledge of advanced surveying methods including EDM's and Total Station
24	HS210 Life Skills	C206.1	knowledge about concept and importance of sustainability
		C206.2	understand about different types of pollution and waste generation, their causes effects and control
		C206.3	understand environmental management standards and environmental impact assessment
		C206.4	understand the concept of bio mimicking, green Engineering and green building
		C206.5	knowledge about various types of conventional and non-conventional energy sources
		C206.6	understand the role of engineering and technology in sustainable development
25	CE231 Civil Engineering Drafting Lab	C207.1	Student should be able to set out a building using tape
		C207.2	Student should be able to set out a building using cross staff
		C207.3	Student should be able to determine area and mass moment of inertia of
		C207.4	to construct one and a half and two brick walls using English bond
		C207.5	Student should be able to calculate the area and volume of various features o f a building
		C207.6	Student should be able to determine the compressive strength of brick and cement mortar cubes using compression testing machine
26	CE233 Surveying Lab	C208.1	The student shall be able to understand the concept of open traverse surveying and apply the same on the fields.
		C208.2	The student shall be able to understand the concept of Levelling and apply it to find elevations of different points in the field by Collimation Method or Rise and Fall Method.
		C208.3	The student shall be able to determine the angles by Method of Reiteration using Theodolite.

		C208.4	The student shall be able to determine the angles by Method of Repetition using Theodolite.
		C208.5	The student shall be able to understand the meaning of slope distance, horizontal distance and vertical height and its measurement using a Total Station Instrument.
		C208.6	The student shall be able to use resection or method of coordinate for the measurement of area using a Total Station Instrument.
27	MA202 Probability Distributions, Transforms and Numerical Methods	C209.1	Graduates will have a concept of discrete probability density functions
		C209.2	Graduates will have a concept of continuous probability density functions
		C209.3	Graduates will get an idea about the Laplace transforms and will be able to apply them in their engineering branches
		C209.4	Graduates will get an idea about the Fourier transforms and will be able to apply them in their engineering branches
		C209.5	Graduates will have a concept of numerical methods for iteration and interpolation and their applications in solving Engineering problems
		C209.6	Graduates will have a concept of numerical methods to solve system of linear equations and numerical integration, and their applications in solving Engineering problems
28	CE202 Structural Analysis I	C210.1	Analyse trusses and understand displacement response of statically determinate structural systems using energy methods
		C210.2	Understand the application of unit load method and strain energy method for determination of deflection of statically determinate beams, frames & pin jointed trusses
		C210.3	Analyse statically indeterminate structures using strain energy method and method of consistent deformation
		C210.4	Gain knowledge about moving loads and influence lines
		C210.5	Gain knowledge about statically determinate suspension bridges and arches
		C210.6	Gain knowledge about statically indeterminate suspension bridges and arches
29	CE204 Construction Technology	C211.1	Students will be able to understand construction materials, their components and manufacturing processes.
		C211.2	Students will be able to know the properties of concrete and different mix design methods
		C211.3	Students will be able to understand details regarding the building construction and masonry domestic buildings.
		C211.4	Students will be able to define the details regarding the components of building
		C211.5	The students will be able to define and describe the concepts of design material of tall framed load bearing building and servicing
		C211.6	Students will be able to know the failures of structures and reasons.
30	CE206 Fluid Mechanics II	C212.1	The students become able to analyse the hydraulic turbines
		C212.2	The students become able to understand the working of hydraulic pumps

		C212.3	They become capable of analysing open channel flows & designing open channels
		C212.4	The students become capable of computation of critical flow and analysis of hydraulic jump
		C212.5	Students become able to analyse surface profiles and gradually varied flow
		C212.6	Students will be able to understand the concept of dimensional analysis and model analysis
31	CE208 Geotechnical Engineering I	C213.1	The students will be able to understand the basic principles governing soil behaviour
		C213.2	Students can identify the soil based on gradation and different consistency limits
		C213.3	Students will be able to calculate total and effective stress with a knowledge of pore water, also the permeability characteristics of different soils
		C213.4	Students can acquire knowledge in different soil tests and will be able to draw the Mohr circle
		C213.5	Gain knowledge in consolidation and practical applications of consolidation
		C213.6	Students get an idea on slopes, its failures and compaction characteristics of soil
32	HS200 Business Economics	C214.1	knowledge about concept and importance of sustainability
		C214.2	understand about different types of pollution and waste generation, their causes effects and control
		C214.3	understand environmental management standards and environmental impact assessment
		C214.4	understand the concept of bio mimicking, green Engineering and green building
		C214.5	knowledge about various types of conventional and non-conventional energy sources
		C214.6	understand the role of engineering and technology in sustainable development
33	CE232 Materials Testing Lab I	C215.1	To determine the Modulus of Elasticity of steel and wood using UTM
		C215.2	To verify Clerk- Maxwell's Reciprocal Theorem and hence determine the Modulus of elasticity of steel.
		C215.3	To determine the Modulus of rigidity of steel using torsion test, spring test and torsion pendulum
		C215.4	To analyse the toughness of a specimen using Impact testing machine
		C215.5	To test the hardness of a material by Rockwell, Brinell and Vickers Hardness test.
		C215.6	To determine the ultimate shear stress of steel using UTM
34	CE234 Fluid Mechanics Lab	C216.1	Students will be able to understand the different flow measurement equipment and their procedures.
		C216.2	Students will be able to analyse the performance characteristics pumps
		C216.3	Graduates will be able to develop the skill of experimentation techniques for the study of flow phenomena in pipes
		C216.4	Students will be able to analyse the performance characteristics turbines
		C216.5	Graduates will be able to develop the skill of experimentation techniques for the study of flow phenomena in channels

		C216.6	Students will be able to compute the hydraulic coefficients of orifices and mouth pieces under constant head method and time of emptying method.
35	CE301 Design of Concrete Structures I	C301.1	Students will be able to apply the fundamental concepts of WSM and LSM.
		C301.2	Students will be able to use IS code of practice for the design of concrete elements.
		C301.3	Students will be able to design various beam elements of reinforced concrete structures by LSD.
		C301.4	The students will get knowledge about basic design of RC slabs by LSD
		C301.5	The students should be able to design reinforced concrete slabs for shear and torsion by LSD and draw the reinforcement details
		C301.6	The students should be able to design reinforced concrete staircases and various types of columns.
36	CE303 Structural Analysis II	C302.1	Analyse structures using three moment theorems
		C302.2	Analyse structures using slope deflection method
		C302.3	Analyse structures using moment distribution method
		C302.4	Analyse structures using Kane's method
		C302.5	Analyse curved beams in plan
		C302.6	Analyse structures using plastic theory
37	CE305 Geotechnical Engineering II	C303.1	The students will be able to learn stress formation in soil due to point load along with Newmark's chart
		C303.2	Students can calculate lateral earth pressures using different methods
		C303.3	Students will be able to calculate ultimate, safe and allowable bearing capacity of shallow foundations and can understand different shear failures
		C303.4	Students can do the design of combined footings and raft foundations with a knowledge in bearing capacity
		C303.5	Gain knowledge in different piles and role of pile foundations in soil mechanics
		C303.6	Students get an idea on machine foundations and the importance in site investigations using different methods of boring
38	CE307 Geomatics	C304.1	To select proper method for balancing the traverse by understanding traversing, and its various methods.
		C304.2	To distinguish between different types of curves and choose the appropriate one by comprehending basics of curves.
		C304.3	Describe the fundamental theory and concepts of the Global Positioning System
		C304.4	Summarize the GPS surveying methods
		C304.5	Explain the fundamental principles of Remote sensing
		C304.6	To apply and arrive at solutions for various civil engineering aspects using Geographical Information System (GIS) tool.

39	CE309 Water Resources Engineering	C305.1	The students will be able to understand the hydrologic cycle and the mechanism of precipitation, infiltration and their measurement.
		C305.2	The students will be able to compute the amount of runoff generated during a storm using hydrograph analysis
		C305.3	The students will be able to determine the water requirement of crops and irrigation efficiencies.
		C305.4	The students will be able to understand the different stream flow measurement techniques and river training works
		C305.5	The students will be able to understand reservoir planning and compute useful life of a reservoir.
		C305.6	The students will be able to understand the distribution and storage of groundwater and apply the knowledge in their extraction.
40	CE 361 Advanced Concrete Technology	C306A.1	Students will be able to understand the testing of different ingredients of concrete- cement, aggregates as per IS code.
		C306A.2	Students will be able to decide the type of admixtures to be used for concreting based on its properties
		C306A.3	Students will be able to design the concrete mix using ACI and IS code methods
		C306A.4	Students will be able to determine the properties of fresh and hardened of concrete
		C306A.5	Students will be able to determine different properties of concrete by applying non-destructive testing of concrete and also explain the factors affecting durability of concrete
		C306A.6	Students will be able to recommend special concretes depending on their specific applications and special processes and technology for particular types of structure
41	CE 363 Geotechnical Investigation	C306B.1	Students will understand the importance of soil exploration programs.
		C306B.2	Understand different methods of soil exploration and also know the application of plate load test
		C306B.3	Identification of various engineering and index properties of soil using standard penetration test and cone penetration test
		C306B.4	the students will able to apply knowledge of geophysical methods to know the type and properties of soil strata
		C306B.5	Understand different types of samplers and methods of sampling
		C306B.6	Students will be able to determine the properties of rock samples and also determination of load carrying capacity of pile.
42	CE341 Design Project	C307.1	The students will be able to understand the engineering aspects of design with reference to simple products
		C307.2	The students will be able to foster innovation in design of products, processes and systems
		C307.3	The students will be able to develop design that add value to products and solve technical problems
		C307.4	The students will be able to study and present new products in a teamwork
		C307.5	The students will be able to think innovatively about different technologies used in engineering field

		C307.6	The students will be able to study and analyse different problems related to engineering field
43	CE331 Materials Testing Lab II	C308.1	Estimate the various properties of fine and coarse aggregate
		C308.2	Determine strength properties of cement
		C308.3	The students will develop the ability to use the IS codes for the Specification and characteristic study of materials used in the concrete.
		C308.4	Find the fresh and hardened concrete properties
		C308.5	Judge the strength of concrete
		C308.6	Determine the strength of different types of tiles
44	CE333 Geotechnical Engineering Lab	C309.1	Students have thorough knowledge about the procedures of laboratory tests
		C309.2	To determine the physical, index and engineering properties of soils
		C309.3	The students will have the capability to classify soils and behaviour based on test results
		C309.4	They will be able to evaluate the permeability and shear strength of soils
		C309.5	Students will be able to evaluate settlement characteristics of soils
		C309.6	They will be able to evaluate compaction characteristics required for field application
45	CE302 Design of Hydraulic Structures	C310.1	Design of irrigation structures like diversion head works
		C310.2	Design of irrigation canals and introduction to regulators and cross drainage works
		C310.3	Design and drawing of minor irrigation structures such as regulators, cross drainage works and canal falls
		C310.4	Perform the stability analysis of gravity dams
		C310.5	Explain the causes of failure of different types of dams and their design criteria
46	CE304 Design of Concrete Structures II	C311.1	Students will be able to design various types of columns using SP 16.
		C311.2	To get knowledge about types of foundations, principles of Combined footings and design of isolated footing.
		C311.3	Students will be able to design and detail cantilever retaining wall and understand the design principles of Counter fort retaining wall.
		C311.4	The students will be able to design and detail circular slabs and domes.
		C311.5	The students will be able to design rectangular and circular water tanks using IS code.
		C311.6	The students gain knowledge of prestressed concrete fundamentals and analyse pre and post tensioned beams.
47	CE306 Computer Programming and Computational Techniques	C312.1	Students will be able to define the numerical techniques for finding solutions of Transcendental equations and interpolations
		C312.2	Students will be able to describe and analyse functional approximations, numerical integration and solution of simultaneous linear algebraic equations

		C312.3	Students will have a fundamental idea about C++ concept, keywords, identifiers, data types, constants and variables, operators and structures of C++
		C312.4	Students will be able to develop the programs for evaluation of factorial of a number, infinite series, sorting, searching and matrix manipulations
		C312.5	Students will be able to write the programs to solve simple engineering programs using function call by value and function call by reference
		C312.6	Students will be able to write the C++ programs to solve simple engineering programs using Class, objects and concepts like inheritance
48	CE308 Transportation Engineering I	C313.1	The students will be able to conduct Engineering Surveys for highway alignment and design cross sectional elements
		C313.2	The students will be able to design various geometric elements of a highway
		C313.3	Students will be able to determine the characteristics of pavement materials and design flexible pavements
		C313.4	Students will be able to identify the various types and causes of failure in flexible and rigid pavements and conduct traffic engineering studies and analyse data for efficient management of roadway facilities
		C313.5	Students will be able to design various traffic control devices and understand types of intersections and the planning of airports.
		C313.6	Students will be able to design basic airport facilities
49	HS300 Principles of Management	C314.1	To recall and identify the relevance of management concepts
		C314.2	To describe, discuss and relate management techniques adopted within an organization
		C314.3	To apply management techniques for meeting current and future management challenges faced by the organization
		C314.4	To compare the management theories and models critically and to inspect and question its validity in the real world
		C314.5	To assess and modify different theories of management so as to relate it to current management challenges
		C314.6	To apply principles of management in order to execute the role as a manager
50	CE 362 Ground Improvement Techniques	C315.1	An understanding about types of ground improvement techniques and soil distribution in India
		C315.2	Knowledge about various types of grouts and their applications
		C315.3	Knowledge about types of chemical stabilization and their construction method
		C315.4	Understanding about Ground Anchors, Rock Bolts and Soil Nailing
		C315.5	Knowledge about Compaction of soil
		C315.6	Understanding about various methods of dewatering of soil
51		C316.1	Students should be able to find different properties of Bitumen

	CE332 Transportation Engineering Lab	C316.2	Students should be able to select the aggregates to be used in pavement by conducting various tests
		C316.3	Students shall be able to find the strength of given soil sample by conducting CBR test
		C316.4	students will be able to find the binding strength of bitumen
		C316.5	Students will be able to determine the properties of aggregates
		C316.6	Students should be able to determine the specific gravity of soil
52	CE334 Computer Aided Civil Engineering Lab	C317.1	Students able to express the concept of CAD/CAM/CIM and Other terminologies used in the development and manufacturing of a product.
		C317.2	Students able to demonstrate different methods for geometric modelling in CAD.
		C317.3	Students able to evaluate the types of curves used in creating a geometry.
		C317.4	Students able to demonstrate different solid modelling representations used in CAD.
		C317.5	Students able to formulate stiffness matrix to analyse structural and thermal problems
53	CE352 Comprehensive Exam	C317.6	Students analyse structural finite element problems by getting knowledge about various finite element methods.
		C318.1	The student will be confident in analysing the fundamental aspects of structural engineering problem/situation
		C318.2	The student will be confident in understanding the fundamental aspects of fluid mechanics problem/situation
		C318.3	The student will be confident in discussing the fundamental aspects of concrete technology problem/situation
		C318.4	The student will be confident in describing the fundamental aspects of transportation engineering problem/situation
54	CE401 Design of Steel Structures	C318.5	The student will be confident in understanding the fundamental aspects of basic civil engineering problem/situation
		C401.1	Students will be able to design bolted and welded connections
		C401.2	To get knowledge about design tension members and beams using the IS specifications
		C401.3	Students will be able to design columns under axial loads using IS specifications
		C401.4	The students will be able design beams and plate girders
55	CE403 Structural Analysis III	C401.5	To get knowledge about to assess loads on truss and design purlins.
		C401.6	The students gain knowledge of design structural components using timber.
		C402.1	To analyse multi-storied frames using approximate methods
		C402.2	To understand the fundamentals of indeterminacies, flexibility and stiffness of structures
		C402.3	To analyse trusses, continuous beams and rigid frames using flexibility method
		C402.4	To analyse trusses, continuous beams and rigid frames by stiffness method
		C402.5	To analyse continuous beams and rigid frames by direct stiffness method

		C402.6	To understand the basic concepts of structural dynamics
56	CE405 Environmental Engineering I	C403.1	To understand basic principles of water supply engineering & to estimate water demand using population forecasting method
		C403.2	students will become aware of various pollutants affecting water quality
		C403.3	students will know about the different units available in a water treatment plant & design of sedimentation tank
		C403.4	The students will become aware of various filters & design of rapid sand filter
		C403.5	Get the idea about disinfectant, hardness removing methods & miscellaneous methods
		C403.6	Students should be able to understand and design distribution networks in water
57	CE407 Transportation Engineering II	C404.1	Students will be able to compare different modes of transportation and alignment of railway
		C404.2	Students will be able to explain the geometric parameters and component of railway track
		C404.3	Students will be able to understand the operations and controlling systems in railways
		C404.4	Students will be able to know the track maintenance and accident control methods
		C404.5	Students will be able to study the setting out and construction of tunnels
		C404.6	Students will be able to illustrate the functions and components of harbours and docks
58	CE409 Quantity Surveying and Valuation	C405.1	Students will be able to identify the quality and quantity of materials, quantity and classes of skilled and unskilled labours and tools and plants required for the project.
		C405.2	Students will be able to analyse the rate of items of work by working out the quantities of different materials and labours required for execution of various items of work.
		C405.3	Students will be able to estimate the quantities, prepare abstract for various items of works- buildings, septic tanks, culverts, roads etc. by drawing up specifications, bar bending schedule and also prepare the schedule of programming of the project
		C405.4	Students will be able to evaluate the value of real and landed property and rent of lease hold property
59	CE 467 Highway Pavement Design	C406.1	Students will understand the basic principles of waste water engineering, design and construction & create awareness about sewer
		C406.2	understand various sewer appurtenances & characteristics of sewage
		C406.3	to get idea about waste water disposal & various treatment units
		C406.4	to create awareness on secondary treatment system
		C406.5	to create awareness on septic tank & working of various treatment units
		C406.6	To create awareness on various sludge treatment methods & sludge disposal.
60	CE451 Seminar & Project Preliminary	C407.1	Students should analyse a current topic of professional interest and present in before audience
		C407.2	Students should identify an engineering problem, analyse it and propose a work plan to solve it

		C407.3	Students should make models to solve a particular problem
		C407.4	Students should be able to communicate effectively about the current methods or techniques in the field of civil engineering
		C407.5	They must be able to adapt to the recent innovations in the field of civil engineering
		C407.6	Students should have the ability to convince public with their innovations
61	CE431 Environmental Engineering Lab	C408.1	Students will be able to analyse dissolved oxygen content in water
		C408.2	Students will be able to determine the biochemical oxygen demand in water
		C408.3	The students will be able to analyse the chemical characteristics of a given water sample viz. pH, acidity, alkalinity
		C408.4	The students will be able to analyse the physical characteristics of a given water sample viz. colour, turbidity & conductivity
		C408.5	The students will be able to determine the optimum dosage of alum using jar test
		C408.6	To estimate the chemical characteristics of a given water sample viz. chlorides, iron, available chlorine & sulphates content to assess its suitability for drinking purpose
62	CE402 Environmental Engineering II	C409.1	Students will understand the basic principles of waste water engineering, design and construction & create awareness about sewer
		C409.2	understand various sewer appurtenances & characteristics of sewage
		C409.3	to get idea about waste water disposal & various treatment units
		C409.4	to create awareness on secondary treatment system
		C409.5	to create awareness on septic tank & working of various treatment units
		C409.6	To create awareness on various sludge treatment methods & sludge disposal.
63	CE404 Civil Engineering Project Management	C410.1	Students will be able to plan and schedule a construction project
		C410.2	Students will be able to select an appropriate construction equipment for a specific job
		C410.3	Students will be able to familiarize the legal procedures in construction contracts.
		C410.4	Students will be able to formulate suitable quality Management plan for construction
		C410.5	The students will be able to familiarize the safety practices and procedures.
		C410.6	The students will be able to apply principles of ethics in decision making.
64	CE 474 Municipal Solid Waste Management	C411.1	The student will be able to know the different sources and characteristics of wastes
		C411.2	Students will understand the factors affecting waste generation, rates
		C411.3	The students will get the knowledge on waste collection methods and services
		C411.4	Students will be able to know the different processing techniques of wastes

		C411.5	To get a knowledge on disposal of solid waste
		C411.6	To know the different composting techniques
65	IE 488 Total Quality Management	C412.1	To recall and identify the relevance of management concepts
		C412.2	To describe, discuss and relate management techniques adopted within an organization
		C412.3	To apply management techniques for meeting current and future management challenges faced by the organization
		C412.4	To compare the management theories and models critically and to inspect and question its validity in the real world
		C412.5	To assess and modify different theories of management so as to relate it to current management challenges
		C412.6	To apply principles of management in order to execute the role as a manager
66	CE492 Project	C413.1	Students should identify an engineering problem, analyse it and propose a work plan to solve it
		C413.2	Students should have the ability to convince others with their innovations in civil engineering
		C413.3	They must be able to adapt to the recent innovations in the field of civil engineering
		C413.4	Students should make models to solve a particular problem
		C413.5	They must be able to undertake a problem, find solutions and should try to implement
		C413.6	They must have a technical knowledge in their selected area

CONSOLIDATED LIST OF COURSE OUTCOMES

Department of Electronics & Communication Engineering

Sl. No	Course Code & Course Name	Course Outcome Number	Course Outcome
1	MA101Calculus	C101.1	To provide some basic tools which are useful in modelling and analysing physical phenomena.
		C101.2	To analyse the physical phenomena involving continuous change of variables.
		C101.3	To evaluate differential and integral calculus of functions of one or more variables and of vector functions.
		C101.4	To evaluate the areas and volumes using integrals
		C101.5	To analyse the application of vector valued functions
		C101.6	To provide basic training in plotting and visualizing graphs of functions and intuitively understanding their properties
2	CY 100 Engineering Chemistry	C102.1	Understand various spectroscopic techniques like UV-Visible, IR, NMR and its applications.
		C102.2	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields.
		C102.3	Basic knowledge of Thermal analytical techniques and conductivity measurements. Basic knowledge of chromatographic techniques.
		C102.4	Have a scope in the area of material science. Have knowledge of synthesizing nano materials and their application in industry, carbon nano tube technology in every industry now a days.
		C102.5	Have knowledge of chemical properties of fuels. Know the properties of lubricants.
		C102.6	Study various types of water treatment methods to develop skills for treating wastewater.
3	BE110- Engineering Graphics	C103.1	Draw the projection of points and lines located in different quadrants
		C103.2	Prepare multiview orthographic projections of objects by visualizing them in different positions
		C103.3	Draw sectional views and develop surfaces of a given object
		C103.4	Prepare pictorial drawings using the principles of isometric and perspective projections to visualise objects in 3 dimensions.
		C103.5	Convert 3D views to orthographic views and vice versa
		C103.6	Obtain multiview projections and solid models of objects using CAD tools

4	BE101-04- Introduction to Electronics Engineering	C104.1	To understand and identify passive components
		C104.2	Student can identify active components and can design, setup simple circuits using diodes
		C104.3	To understand the basics of BJT and detailed study of its characteristics
		C104.4	To understand and detailed study of JFET&MOSFET
		C104.5	To understand the working of rectifier
		C104.6	Voltage and currents can be measured and monitored using electronic measuring instruments
5	BE103- Introduction to Sustainable Engineering	C105.1	The students should have knowledge about the concept and importance of sustainability
		C105.2	The students should be able to understand different types of pollution and waste generation, their causes, effects and control
		C105.3	The students should be able to understand environmental management standards and environmental impact assessment
		C105.4	The students should be able to understand the concepts of bio mimicking, green engineering, green building, sustainable habitat, sustainable urbanization
		C105.5	Students should have a knowledge of various types of conventional and non-conventional energy sources
		C105.6	Students should be able to understand the role of engineering and technology in sustainable development
6	ME100-Basics of Mechanical Engineering	C106.1	Acquire knowledge on fundamental concepts of thermodynamics and laws of thermodynamics.
		C106.2	Use energy conservation devices from the knowledge of the energy conversion device.
		C106.3	Select and use an appropriate refrigeration and air conditioning systems
		C106.4	Develop and implement basic ideas of the different parts, working of automobile and fundamentals of aerodynamics
		C106.5	Preparation and ability to engage in independent and life-long learning in the context of knowledge on engineering materials.
		C106.6	Select and use the different manufacturing methods
7	CY110- Engineering Chemistry Lab	C107.1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses
		C107.2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs
		C107.3	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR spectra of some organic compounds
		C107.4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis

		C107.5	Learn to design and carry out scientific experiments as well as accurately record and analyse the results of such experiments
		C107.6	Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social, economic and environmental problems and why it is an integral part of curriculum
8	ME110- Mechanical Workshop	C108.1	Knowledge achieved to explain the various manufacturing process in the basic mechanical engineering workshop sections- smithy, carpentry, assembling, welding etc.
		C108.2	Identify the various hand tools used in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc.
		C108.3	Able to choose different measuring devises according to the work.
		C108.4	Ability to name and summarize the operations of various machine tools like lathe, milling, drilling and shaping machines.
		C108.5	Knowledge achieved to disassemble and assemble the machines like IC engines.
		C108.6	Skill achieved to construct models by using basic mechanical workshop sections like welding, moulding, smithy, carpentry etc.
9	EC110- Electronics Workshop	C109.1	Graduates will be able to recognize the appropriate methods to solve electronics and communication problems.
		C109.2	Graduates will be able to acquire basic training and skills to solve basic electronics problems.
		C109.3	Graduates will be able to apply the equations and formulas to solve related practical value problems.
		C109.4	Graduates will be able to calculate the problems in Diodes, biasing of transistor, amplifiers, oscillators and regulator circuits.
		C109.5	Graduates will be able to evaluate communication systems like RADAR, GPS, Entertainment Electronics
		C109.6	Graduates will be able to measure current voltage values using equipment and to analyse a waveform
10	MA102 - Differential Equations	C110.1	Graduates will be able acquire basic knowledge of homogeneous differential equations and methods of solving them.
		C110.2	Graduates will be able acquire basic knowledge of non-homogeneous differential equations and methods of solving them.
		C110.3	Graduates will be able to apply Fourier series for analysing periodic functions in terms of their frequency components.
		C110.4	Graduates will be able form and solve using partial differential equations
		C110.5	Graduates will be able to Identify, analyse and subsequently solve the distribution of heat problems whose behaviour can be described by differential equations.
		C110.6	Graduates will be able to Identify, analyse and subsequently solve the waves whose behaviour can be described by differential equations.

11	PH100 - Engineering Physics	C111.1	To develop an ability to understand the concepts of waves and harmonic oscillations and apply its knowledge in mechanical and electrical systems
		C111.2	Ability to differentiate between interference, diffraction and Polarization in various optical phenomenon
		C111.3	Distinguish between different types of superconductors and study their applications
		C111.4	To study the concepts of quantum mechanics and statistical mechanics
		C111.5	Using the knowledge of acoustics in designing acoustically important Buildings.
		C111.6	To apply the concepts of laser technology in various devices
12	BE100- Engineering Mechanics	C112.1	Solve problems dealing with forces and determine the resultant. Also Identify the forces acting on a body and draw the free body diagram
		C112.2	Solve problems on forces acting on a body in space. Also determine the support reactions of beams subjected to concentrated loads and uniformly distributed loads
		C112.3	Determine the centroid and moment of inertia of composite areas.
		C112.4	Analyse the concept of friction to solve problems of bodies placed on rough surfaces and solve problems on support reactions of beams using principle of virtual work.
		C112.5	Use Newton's second law to solve problems on bodies in motion and apply the concept of instantaneous centre to bodies having combined translation and rotation.
		C112.6	Knowledge on types of Vibration and solve problem using the concept of Simple Harmonic Motion
13	BE102-Design & Engineering	C113.1	Graduates will be able to classify and experiment different stages in design with their significance
		C113.2	Aware of the product oriented and user-oriented aspects that make the design a success.
		C113.3	The students will be able to identify & initiate different creative designs.
		C113.4	Enable the students to analyse the prototype models needed for development of project
		C113.5	Graduates will be able to Select the design requirements for designing various products.
		C113.6	The students can evaluate the product based on intellectual property rights
14	CE 100-Basics of Civil Engineering	C114.1	The students will be able to illustrate the fundamental aspects of Civil engineering
		C114.2	The students will be able to plan and set out a building
		C114.3	Students will be able to explain the concepts of surveying for making horizontal and vertical measurements.
		C114.4	They will able to illustrate the uses of various building materials and explain the method of construction of different components of a building.
		C114.5	Students will be able to illustrate the uses of various building elements.
		C114.6	Students will be able to discuss about various services in a building.

15	EC 100-Basics of Electrical Engineering	C115.1	Students will be able to acquire fundamental knowledge of Electrical circuits and can solve circuit related problems.
		C115.2	Students will be able to recall and state ideas about magnetic circuits.
		C115.3	Students will be able to explain the fundamentals of AC circuits.
		C115.4	Students will be able to analyse three phase systems.
		C115.5	Students will be able to compare and contrast the various types of renewable energy sources.
		C115.6	Students will be able to identify and differentiate between various AC and DC machines.
16	PH110-Engineering Physics Lab	C116.1	Develop analytical/experimental skills and impart prerequisite hands-on experience for engineering laboratories
		C116.2	Understand the need for precise measurement practices for data recording
		C116.3	Understand the principle, concept, working and applications of relevant technologies and comparison of results with theoretical calculations
		C116.4	Analyse the techniques and skills associated with modern scientific tools such as lasers and fibre optics
		C116.5	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results
		C116.6	To apply the concepts of laser technology in various devices
17	CE110-Civil Workshop	C117.1	Student should be able to set out a building using tape
		C117.2	Student should be able to set out a building using cross staff
		C117.3	Student should be able to determine area and mass moment of inertia of
		C117.4	to construct one and a half and two brick walls using English bond
		C117.5	Student should be able to calculate the area and volume of various features of a building
		C117.6	Student should be able to determine the compressive strength of brick and cement mortar cubes using compression testing machine
18	EE110-Electrical Workshop	C118.1	Students will be able to recognize supply arrangements and their limitations, standard voltages and their tolerances, safety aspects of electrical systems and importance of protective measures in wiring systems.
		C118.2	Students will identify the types of wires, cables and other accessories used in wiring.
		C118.3	Students should be able to wire up and predict estimate of simple lighting circuits for domestic buildings and distinguish between light and power circuits
		C118.4	Students will be able to measure electrical circuit parameters like current, voltage and power in a circuit.
		C118.5	Students will be able to explain the usage of Multimeters and LCR Q meters
		C118.6	Creating awareness of energy conservation in electrical systems.

19	MA201-Linear Algebra & Complex Analysis	C201.1	Graduates will be able to identify the analytic functions and harmonic functions.
		C201.2	Graduates will be able to understand the conformal mappings and to find regions that are mapped under certain Transformations
		C201.3	Graduates will be able to evaluate the complex integrals
		C201.4	Graduates will be able to evaluate the complex integrals as an applications of residue theorems
		C201.5	Graduates will be able to understand the concept of vector space, to solve the system of linear equations
		C201.6	Graduates will be able to and to evaluate the Eigen value, Eigen vectors of a matrix and diagonalize a matrix.
20	EC201-Network Theory	C202.1	Graduates will be able to understand the basic circuit elements, circuit variables and Kirchhoff laws.
		C202.2	Graduates will be able to solve problems using mesh and node analysis.
		C202.3	Graduates will be able to analyse circuits in the phasor form.
		C202.4	Graduates will be able to analyse circuits in Laplace domain.
		C202.5	Graduates will be able to understand the concept of two port networks
		C202.6	Graduates can understand tuned circuits & resonance.
21	EC203- Solid State Devices	C203.1	Graduates will be able to define and understand the concepts in semiconductor physics.
		C203.2	Graduates will be able to describe and apply the generation and recombination processes in semiconductors.
		C203.3	Graduates will be able to explain the structure, creation of electric field and working of PN junction semiconductor diodes.
		C203.4	Graduates will be able to illustrate the minority carrier distribution across PN junction semiconductor diodes.
		C203.5	Graduates will develop skills and can-do research in new concepts and devices.
		C203.6	Graduates can summarize concepts that studied relating different modes of operation and the various current components in BJTs and analyse energy band diagram of PN junction diodes, BJTs, metal semiconductor junctions and MOS capacitors.
22	EC205- Electronic Circuits	C204.1	Graduates will get basic ideas about lowpass high pass circuits and bit
		C204.2	Graduates will be able to explain small signal analysis of CE, CB and CC configurations
		C204.3	Graduates will be able to illustrate Analysis of high frequency response of CE, CB and CC amplifiers
		C204.4	Graduates will understand details about Feedback amplifiers
		C204.5	To know basics of Power amplifiers
		C204.6	understand Transistor based voltage regulator design and analysis

23	EC207- Logic Circuit Design	C205.1	Compare various positional number systems and binary codes
		C205.2	Apply Boolean algebra in logic circuit design
		C205.3	Design combinational and sequential circuits
		C205.4	Design and implement digital systems using basic programmable blocks
		C205.5	Formulate various digital systems using HDL
		C205.6	Designing of Finite state Machine
24	HS210 -Life Skills	C206.1	knowledge about concept and importance of sustainability
		C206.2	understand about different types of pollution and waste generation, their causes effects and control
		C206.3	understand environmental management standards and environmental impact assessment
		C206.4	understand the concept of bio mimicking, green Engineering and green building
		C206.5	knowledge about various types of conventional and non-conventional energy sources
		C206.6	understand the role of engineering and technology in sustainable development
25	EC231 Electronic Devices & Circuits Lab	C207.1	To understand VI Characteristics of rectifier and Zener diodes
		C207.2	To Understand RC integrating and differentiating circuits
		C207.3	To Understand Characteristics of BJT in CE configuration and evaluation of parameters
		C207.4	Able to design Feedback amplifiers (current series, voltage series) - gain and frequency response
		C207.5	Able to design Low frequency oscillators –RC phase shift, Wien bridge,
		C207.6	Able to design Multivibrators -A stable, Monostable and Bistable
26	EC233 - Electronics Design Automation Lab	C208.1	An ability to apply knowledge of computer, science, and engineering to the analysis of electrical and electronic engineering problems.
		C208.2	An ability to design systems which include hardware and software components.
		C208.3	An ability to identify, formulate and solve engineering problems.
		C208.4	An ability to use modern engineering technique
		C208.5	To study Different software's for design electronic circuits
		C208.6	To study and design complex engineering problems
27	MA204 Probability Distributions,	C209.1	students would have become familiar with quantifying and analysing random phenomena using various discrete random variable models of probability distributions
		C209.2	students would have become familiar with quantifying and analysing random phenomena using various continuous random variable models of probability distributions

	Random Processes	C209.3	Students would have become familiar with quantifying and analysing random phenomena using multiple random variables
		C209.4	students would also have learned the concepts of random process
		C209.5	Students would have become familiar with some special random processes and to apply Markov Chain in prediction of future events
		C209.6	Some of the fundamental numerical methods learned in the course would help them to solve a variety of mathematical problems by the use of computers when analytical methods fail or are difficult
28	EC202 Signals and Systems	C210.1	To Understand the continuous and discrete time signals
		C210.2	To understand CT signals in Fourier series and interpret the properties of Fourier
		C210.3	convolutions, correlation and to describe the orthogonality
		C210.4	of signals.
29	EC204 Analog Integrated Circuits	C211.1	Understand Differential amplifiers and Operational amplifiers:
		C211.2	To understand the basics of Op-amp
		C211.3	To understand Op-amp applications
		C211.4	To study A stable and monostable multivibrators and Active filters
		C211.5	Study Specialized ICs and its applications such as Timer IC 555, PLL IC 565 and IC 723
		C211.6	To understand Data Converters
30	EC206 Computer Organization	C212.1	To understand the functional units of a computer
		C212.2	To identify the different types of instructions
		C212.3	To understand various addressing modes
		C212.4	To learn the design concepts of multi cycle processor
		C212.5	To understand the I/O addressing system
		C212.6	To categorize the different types of memories
31	EC208 Analog Communication Engineering	C213.1	Students will be able to understand and apply the need for modulation
		C213.2	Students will be able to understand and apply modulation techniques in a communication system
		C213.3	Students will be able to understand effect of noise in communication system
		C213.4	Students will have sound knowledge and able to understand the radio transmitters
		C213.5	Students will have sound knowledge and able to understand the radio Receivers
		C213.6	Students will have sound knowledge of the working of a communication system like the telephone system
32		C214.1	knowledge about concept and importance of sustainability

	HS200 Business Economics	C214.2	understand about different types of pollution and waste generation, their causes effects and control
		C214.3	understand environmental management standards and environmental impact assessment
		C214.4	understand the concept of bio mimicking, green Engineering and green building
		C214.5	knowledge about various types of conventional and non-conventional energy sources
		C214.6	understand the role of engineering and technology in sustainable development
		33	EC230 Logic Circuit Design Lab
C215.2	Student should be able to analyse and design various applications of digital circuits		
C215.3	Student should be able to explain the working of standard digital ICs		
C215.4	Student should be able to explain basic building blocks in digital circuits		
C215.5	Student should be able to design and implement combinational circuits		
C215.6	Student should be able to design and implement sequential circuits		
34	EC232 Analogue Integrated Circuits Lab	C216.1	Familiarization of Operational amplifiers
		C216.2	Student should be able to design Schmitt trigger circuit using Op –Amps
		C216.3	Student should be able to design A stable and Monostable multivibrator using Op -Amps
		C216.4	Student should be able to design Timer IC NE555
		C216.5	Student should be able to design IC voltage regulators
		C216.6	Study of PLL IC: free running frequency lock range capture range
35	EC301 Digital Signal Processing	C301.1	The students will understand the fundamentals of discrete time signals, systems and their properties.
		C301.2	The students will understand various finite word length effects in digital filters.
		C301.3	The students will be able to design an analog butterworth IIR filter.
		C301.4	The students will be able to design a digital FIR filter using window technique.
		C301.5	The students will understand the basics of Discrete Fourier Transform
		C301.6	The students will understand the basics of Fast Fourier Transform.
36	EC303 Applied Electromagnetic Theory	C302.1	Analyse fields and potentials due to static charges
		C302.2	Explain the physical meaning of the differential equations for electrostatic and magnetic fields
		C302.3	Understand how materials are affected by electric and magnetic fields
		C302.4	Understand the relation between fields under time varying situations
		C302.5	Understand principles of propagation of uniform plane waves
		C302.6	Outline electromagnetic interference and compatibility

37	EC305 Microprocessors & Microcontrollers	C303.1	Understands various types of processors, architecture and its operations
		C303.2	Learns the machine cycles their functions and interfacings
		C303.3	Understands the concept of memory organizations and architecture of 8051
		C303.4	Develops programming skills in 8051
		C303.5	Understands the types of interrupts, timers, counters
		C303.6	Understands the interfacing modules
38	EC307 Power Electronics & Instrumentation	C304.1	Graduates will be able to explain the model circuits of power system components and per unit systems.
		C304.2	Graduates will be able to perform analysis of power systems subject to symmetrical and unsymmetrical faults.
		C304.3	Graduates will be capable of defining, explaining, establishing and solving equations for power flows based on nodal admittance and impedance matrix.
		C304.4	Graduates can explain the concepts of automatic generation control, load frequency control and automatic voltage control.
		C304.5	Graduates can outline the principles of economic load dispatch and unit commitment.
		C304.6	Graduates will be able to analyse the power system stability criterion.
39	HS300 Principles of Management	C305.1	To recall and identify the relevance of management concepts
		C305.2	To describe, discuss and relate management techniques adopted within an organization
		C305.3	To apply management techniques for meeting current and future management challenges faced by the organization
		C305.4	To compare the management theories and models critically and to inspect and question its validity in the real world
		C305.5	To assess and modify different theories of management so as to relate it to current management challenges
		C305.6	To apply principles of management in order to execute the role as a manager
40	EC365 Biomedical Engineering	C306.1	Discuss the overview of anatomy and physiological systems of the body
		C306.2	Illustrate the sources of bio electric potentials and electrodes.
		C306.3	Describe the principle, working and applications of various diagnostic and therapy related equipment's.
		C306.4	Illustrate the working of various instruments for clinical laboratory.
		C306.5	List the applications of medical imaging systems.
		C306.6	Discuss the importance of telemetry in patient care and patient safety in electromedical equipment.
41	EC341 Design Project	C307.1	The students will be able to think innovatively on the development of components, products.
		C307.2	To analyse the problem requirements and arrive workable design solutions
		C307.3	To familiarize with the EDA software

		C307.4	To familiarize with the processes or technologies in the engineering field
		C307.5	To understand Testing of a Circuit
		C307.6	To study about the communication between the various modules in the design
42	EC333 Digital Signal Processing Lab	C308.1	The students will be able to design and simulate systems related to DSP.
		C308.2	The students will be able to realize various systems related to DSP
		C308.3	To study design using DSP kit
		C308.4	To study Filters in DSP
		C308.5	To develop algorithm for different programs
43	EC335 Power Electronics & Instrumentation Lab	C309.1	To design and implement basic power electronic circuits
		C309.2	To design and demonstrate basic power electronic devices
		C309.3	To study the working of transducers
		C309.4	To use transducers for application
		C309.5	To train the usage of digital instruments
		C309.6	To equip student groups to design and implement simple power electronic circuits individually
44	EC302 Digital Communication	C310.1	To understand the concept of Random process & pulse code modulations
		C310.2	To apply the knowledge of ISI problems in Digital Communication to derive Nyquist criterion for zero ISI
		C310.3	To study the geometrical representation of signals & mathematical modelling of channels
		C310.4	To understand the error probability for various digital modulation schemes
		C310.5	To study the principle of spread spectrum communication & to understand the concept of FHSS & DSSS
		C310.6	To understand various multiple access techniques
45	EC304 VLSI	C311.1	To give the knowledge about IC fabrication details and material preparations
		C311.2	To impart knowledge on Lay put design
		C311.3	To impart the skills of analysis and design of MOSFET and CMOS Logic design
		C311.4	To know about the Pass transistor logic
		C311.5	To know about CMOS memory
		C311.6	To impart knowledge about adder circuits in VLSI
46	EC306 Antenna & Wave Propagation	C312.1	To have a sound understanding of the various parameters used for characterizing antennas: their optimum values and their measurements
		C312.2	To know about different antenna types such as short dipole and half wave dipole
		C312.3	To have a sound understanding of the concept of antenna arrays, its analysis and their different types

		C312.4	Will have a sound understanding of the different antenna types and their applications
		C312.5	To understand Principle of Log periodic antenna array, Helical antenna and Design of rectangular Patch antennas.
		C312.6	Will have able to understand the various modes of radio propagation and relate it to real communication instances
47	EC308 Embedded System	C313.1	To have a thorough understanding of the basic structure and design of embedded system
		C313.2	To study the different ways of communicating with I/O devices and standard I/O interfaces
		C313.3	To gain knowledge about memory devices and systems
		C313.4	To study the programming concepts of embedded system
		C313.5	To learn different process and its functions
		C313.6	To study the architecture of system -on chip and some design examples
48	EC312 Object Oriented Programming	C314.1	apply object-oriented principles in software design process.
		C314.2	develop Java programs for real applications using java constructs and libraries.
		C314.3	understand and apply various object-oriented features like inheritance, data
		C314.4	abstraction, encapsulation and polymorphism to solve various computing problems using java
		C314.5	implement Exception Handling in java.
		C314.6	use graphical user interface and Event Handling in java.
49	EC366 Real Time Operating Systems	C315.1	To understand the fundamental of operating systems and its structure
		C315.2	To know about various scheduling concepts and its priority
		C315.3	To apply principle and working of deadlock Systems
		C315.4	To explain the principle and working of memory allocation strategies
		C315.5	To have a basic idea of I/O management and operating system design
		C315.6	To know about the comparison and case study of RTOS control systems
50	EC332 Communication Engg. Lab (Analog & Digital)	C316.1	To provide experience on design, testing and analysis of few electronic circuits used in communication engineering.
		C316.2	The students will be able to understand the basic concepts of circuits used in communication systems.
51	EC334 Microcontroller Lab	C317.1	To understand Assembly Language programming of Microcontroller.
		C317.2	To Program Micro controllers
		C317.3	To interface simple peripheral devices to a Microcontroller

		C317.4	To implement interfacing of various peripheral devices to the microcontroller through assembly language programming.
		C317.5	To function effectively as an individual and in a team to accomplish the task
		C317.6	To equip student groups to design and implement simple embedded systems.
52	EC352 Comprehensive Exam	C318.1	The students will be confident in discussing the fundamental aspects of any engineering problem/situation and give answers in dealing with them
		C318.2	To prepare students to have successful careers in in the core areas of Electronics and communication Engineering and related companies of national and international reputed to excel.
		C318.3	To train students in with objective types multiple choice questions and mock interviews in the core areas of Electronics and communication Engineering.
		C318.4	To train the students to develop the ability to succeed in competitive exams for higher education in postgraduate programs & research (GATE / GRE / PSU's).
		C318.5	The ability to face the test and interview conducted by different companies and succeed
		C318.6	To train the students towards higher studies in Technology or Management depending on their inclination & aptitude. For postgraduate programs & research (GATE / GRE / PSU's).
53	EC401 Information Theory & Coding	C401.1	To understand the basics of information theory and source coding
		C401.2	To understand the knowledge of Shannon's source coding theorem and channel coding theorem
		C401.3	To understand continuous source and channels
		C401.4	To Apply the knowledge of coding theorem for designing an efficient and error free communication link.
		C401.5	To Analyse various coding schemes
		C401.6	To Design an optimum decodes for various coding schemes used.
54	EC403 Microwave & Radar Engg	C402.1	To introduce the various microwave sources
		C402.2	To Know about Cross field Oscillators
		C402.3	To know the measurement of various parameters
		C402.4	To know about microwave hybrid structures
		C402.5	To know about Microwave solid state devices
		C402.6	To understand the basic concepts, types, working of radar and introduce to radar transmitters and receivers.
55	EC405 Optical Communication	C403.1	Know the working of optical source and detectors.
		C403.2	Compare the performance of various optical modulation schemes.
		C403.3	Apply the knowledge of optical amplifiers in the design of optical link.
		C403.4	Analyse the performance of optical amplifiers.

		C403.5	Know the concept of WDM
		C403.6	Describe the principle of FSO and LiFi.
56	EC407 Computer Communication	C404.1	Understanding Different types of network topologies and protocols.
		C404.2	Understanding The layers of the OSI model and TCP/IP with their functions
		C404.3	Learning The concept of subnetting and routing mechanisms
		C404.4	Learning The basic protocols of computer networks.
		C404.5	Understanding how protocols can be used to assist in network design and implementation.
		C404.6	Understanding Security aspects in designing a trusted computer communication system
57	EC409 Control Systems	C405.1	Students will be able to represent systems mathematically and derive their transfer function model.
		C405.2	Students will be able to analyse the time response and frequency response of the systems for various input signals
		C405.3	Students will be able to determine the stability of system
		C405.4	Students understand the performance of different basic controllers
		C405.5	Students will be able to perform state variable analysis of systems
		C405.6	Students will be able to analyse a digital control system
58	EC465 MEMS	C406.1	understanding basic concepts of MEMS
		C406.2	Understand the working principles of micro sensors and actuators
		C406.3	Understand the application of scaling laws in the design of micro systems
		C406.4	Understand the typical materials used for fabrication of micro systems
		C406.5	Understand the principles of standard micro fabrication techniques
59	EC451 Seminar & Project Preliminary	C407.1	Demonstrate a sound technical knowledge of their selected topic.
		C407.2	Undertake problem identification, formulation and solution.
		C407.3	To study the key design aspects of the selected domain
		C407.4	Conduct Literature review
		C407.5	Communicate with engineers and the community at large in written an oral form.
		C407.6	Demonstrate the knowledge, skills and attitudes of a professional engineer.
60	EC431 Communication Systems Lab	C408.1	To study the mode characteristics of Reflex Klystron
		C408.2	To analyse and measure certain parameters of microwave passive devices
		C408.3	To understand the radiation pattern measurement of antenna
		C408.4	To study numerical aperture of a fibre and measure losses in optical fibre

	(Optical & Microwave)	C408.5	To understand the characteristics of LED by setting up fibre optic link
		C408.6	To understand the characteristics of LASER diode by setting up fibre optic link
61	EC402 Nano electronics	C409.1	To understand the behaviour of materials in nano dimensions
		C409.2	To get an idea about nano fabrication methods
		C409.3	To understand the method of characterization of nano structures
		C409.4	To study basic nano structures
		C409.5	To understand behaviour of electronics in nano structures
		C409.6	To study the operation of nano electronics devices
62	EC404 Advanced Communication Systems	C410.1	To impart the basic concepts of various communication system.
		C410.2	To understands the concepts in modulation of signals
		C410.3	To study the aspects relating to transmission of electronic waves
		C410.4	To study the concepts relating to satellite communication
		C410.5	To impart the basic concepts of wireless communication systems.
		C410.6	To understand the principles of Digital Broadcasting Mechanism
63	EC464 Low Power VLSI Design	C411.1	To identify the sources of power dissipation in digital IC systems.
		C411.2	To understand the impact of power on system performance and reliability.
		C411.3	To understand leakage sources and reduction techniques.
		C411.4	To learn advanced issues in VLSI systems, specific to the deep-submicron silicon Technologies.
		C411.5	To impart the mechanisms of power dissipation in CMOS integrated circuits.
		C411.6	Familiar about adiabatic switching.
64	CE488 Disaster management	C412A.1	Students will be able to explain disaster management theory (cycle, phases, risk, crisis, emergency, disasters, resilience)
		C412A.2	To compare hazards, disasters and associated natural phenomena and their interrelationships, causes and their effects - developing humanitarian Assistance before and after disaster
		C412A.3	To compare anthropogenic hazards, disasters and associated activities and their interrelationships of the subsystems - Green House Effect, Global warming, Causes and their effects and development of humanitarian assistance before and after disaster
		C412A.4	To apply knowledge about existing global frameworks and existing agreements and role of community in successful Disaster Risk Reduction
		C412A.5	To evaluate DM study including data search, analysis and presentation as a case study.

		C412A.6	To create Technological innovations in Disaster Risk Reduction: Advantages and problems
65	IE488 Total Quality Management	C412B.1	To recall and identify the relevance of management concepts
		C412B.2	To describe, discuss and relate management techniques adopted within an organization
		C412B.3	To apply management techniques for meeting current and future management challenges faced by the organization
		C412B.4	To compare the management theories and models critically and to inspect and question its validity in the real world
		C412B.5	To assess and modify different theories of management so as to relate it to current management challenges
		C412B.6	To apply principles of management in order to execute the role as a manager
66	EC492 Project	C413.1	Demonstrate a sound technical knowledge of their selected project topic.
		C413.2	Undertake problem identification, formulation and solution.
		C413.3	Design engineering solutions to complex problems utilising a systems approach.
		C413.4	Conduct an engineering project
		C413.5	Communicate with engineers and the community at large in written an oral form.
		C413.6	Demonstrate the knowledge, skills and attitudes of a professional engineer.

CONSOLIDATED LIST OF COURSE OUTCOMES

Department of Electrical & Electronics Engineering

Sl. No	Course Code & Course Name	Course Outcome Number	Course Outcome
1	MA101Calculus	C101.1	To provide some basic tools which are useful in modelling and analysing physical phenomena.
		C101.2	To analyse the physical phenomena involving continuous change of variables.
		C101.3	To evaluate differential and integral calculus of functions of one or more variables and of vector functions.
		C101.4	To evaluate the areas and volumes using integrals
		C101.5	To analyse the application of vector valued functions
		C101.6	To provide basic training in plotting and visualizing graphs of functions and intuitively understanding their properties
2	PH100Engineering Chemistry	C102.1	Understand various spectroscopic techniques like UV-Visible, IR, NMR and its applications.
		C102.2	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields.
		C102.3	Basic knowledge of Thermal analytical techniques and conductivity measurements. Basic knowledge of chromatographic techniques.
		C102.4	Have a scope in the area of material science. Have knowledge of synthesizing nano materials and their application in industry, carbon nano tube technology in every industry now a days.
		C102.5	Have knowledge of chemical properties of fuels. Know the properties of lubricants.
		C102.6	Study various types of water treatment methods to develop skills for treating wastewater.
3	BE110Engineering Graphics	C103.1	Draw the projection of points and lines located in different quadrants
		C103.2	Prepare multiview orthographic projections of objects by visualizing them in different positions
		C103.3	Draw sectional views and develop surfaces of a given object
		C103.4	Prepare pictorial drawings using the principles of isometric and perspective projections to visualise objects in 3 dimensions.
		C103.5	Convert 3D views to orthographic views and vice versa
		C103.6	Obtain multiview projections and solid models of objects using CAD tools
4	BE101-03Introduction to Electrical Engineering	C104.1	Students will be able to acquire fundamental knowledge of Electrical circuits and can solve circuit related problems.
		C104.2	Students will be able to recall and state ideas about magnetic circuits

		C104.3	Students will be able to explain the fundamentals of AC circuits.
		C104.4	Students will be able to analyse three phase systems.
		C104.5	Students will be able to compare and contrast various types of resonance circuits
		C104.6	Students will be able to identify and differentiate between various methods of Power measurement
5	BE103Introduction to Sustainable Engineering	C105.1	The students should have knowledge about the concept and importance of sustainability
		C105.2	The students should be able to understand different types of pollution and waste generation, their causes, effects and control
		C105.3	The students should be able to understand environmental management standards and environmental impact assessment
		C105.4	The students should be able to understand the concepts of bio mimicking, green engineering, green building, sustainable habitat, sustainable urbanization
		C105.5	Students should have a knowledge of various types of conventional and non-conventional energy sources
		C105.6	Students should be able to understand the role of engineering and technology in sustainable development
6	ME100Basics of Mechanical Engineering	C106.1	Acquire knowledge on fundamental concepts of thermodynamics and laws of thermodynamics.
		C106.2	Use energy conservation devices from the knowledge of the energy conversion device.
		C106.3	Select and use an appropriate refrigeration and air conditioning systems
		C106.4	Develop and implement basic ideas of the different parts, working of automobile and fundamentals of aerodynamics
		C106.5	Preparation and ability to engage in independent and life-long learning in the context of knowledge on engineering materials.
		C106.6	Select and use the different manufacturing methods
7	CY110Engineering Chemistry Lab	C107.1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses
		C107.2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs
		C107.3	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR spectra of some organic compounds
		C107.4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis
		C107.5	Learn to design and carry out scientific experiments as well as accurately record and analyse the results of such experiments

		C107.6	Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social, economic and environmental problems and why it is an integral part of curriculum
8	ME110Mechanical Workshop	C108.1	Knowledge achieved to explain the various manufacturing process in the basic mechanical engineering workshop sections- smithy, carpentry, assembling, welding etc.
		C108.2	Identify the various hand tools used in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc.
		C108.3	Able to choose different measuring devises according to the work.
		C108.4	Ability to name and summarize the operations of various machine tools like lathe, milling, drilling and shaping machines.
		C108.5	Knowledge achieved to disassemble and assemble the machines like IC engines.
		C108.6	Skill achieved to construct models by using basic mechanical workshop sections like welding, moulding, smithy, carpentry etc.
9	CE110Electrical Workshop	C109.1	Students will be able to recognize supply arrangements and their limitations, standard voltages and their tolerances, safety aspects of electrical systems and importance of protective measures in wiring systems.
		C109.2	Students will identify the types of wires, cables and other accessories used in wiring.
		C109.3	Students should be able to wire up and predict estimate of simple lighting circuits for domestic buildings and distinguish between light and power circuits
		C109.4	Students will be able to measure electrical circuit parameters like current, voltage and power in a circuit.
		C109.5	Students will be able to explain the usage of Multimeters and LCR Q meters
		C109.6	Creating awareness of energy conservation in electrical systems.
10	MA102Differential Equations	C110.1	Graduates will be able acquire basic knowledge of homogeneous differential equations and methods of solving them.
		C110.2	Graduates will be able acquire basic knowledge of non-homogeneous differential equations and methods of solving them.
		C110.3	Graduates will be able to apply Fourier series for analysing periodic functions in terms of their frequency components.
		C110.4	Graduates will be able form and solve using partial differential equations
		C110.5	Graduates will be able to Identify, analyse and subsequently solve the distribution of heat problems whose behaviour can be described by differential equations.
		C110.6	Graduates will be able to Identify, analyse and subsequently solve the waves whose behaviour can be described by differential equations.
11	PH100Engineering Physics	C111.1	To develop an ability to understand the concepts of waves and harmonic oscillations and apply its knowledge in mechanical and electrical systems

		C111.2	Ability to differentiate between interference, diffraction and Polarization in various optical phenomenon
		C111.3	Distinguish between different types of superconductors and study their applications
		C111.4	To study the concepts of quantum mechanics and statistical mechanics
		C111.5	Using the knowledge of acoustics in designing acoustically important Buildings.
		C111.6	To apply the concepts of laser technology in various devices
12	BE100Engineering Mechanics	C112.1	Solve problems dealing with forces and determine the resultant. Also Identify the forces acting on a body and draw the free body diagram
		C112.2	Solve problems on forces acting on a body in space. Also determine the support reactions of beams subjected to concentrated loads and uniformly distributed loads
		C112.3	Determine the centroid and moment of inertia of composite areas.
		C112.4	Analyse the concept of friction to solve problems of bodies placed on rough surfaces and solve problems on support reactions of beams using principle of virtual work.
		C112.5	Use Newton's second law to solve problems on bodies in motion and apply the concept of instantaneous centre to bodies having combined translation and rotation.
		C112.6	Knowledge on types of Vibration and solve problem using the concept of Simple Harmonic Motion
13	BE102Design & Engineering	C113.1	Graduates will be able to classify and experiment different stages in design with their significance
		C113.2	Aware of the product oriented and user-oriented aspects that make the design a success.
		C113.3	The students will be able to identify & initiate different creative designs.
		C113.4	Enable the students to analyse the prototype models needed for development of project
		C113.5	Graduates will be able to Select the design requirements for designing various products.
		C113.6	The students can evaluate the product based on intellectual property rights
14	CE 100Basics of Civil Engineering	C114.1	The students will be able to illustrate the fundamental aspects of Civil engineering
		C114.2	The students will be able to plan and set out a building
		C114.3	Students will be able to explain the concepts of surveying for making horizontal and vertical measurements.
		C114.4	They will able to illustrate the uses of various building materials and explain the method of construction of different components of a building.
		C114.5	Students will be able to illustrate the uses of various building elements.
		C114.6	Students will be able to discuss about various services in a building.
15	EC 100Basics of Electronics Engineering	C115.1	To understand and identify passive components
		C115.2	Student can identify active components and can design, setup simple circuits using diodes
		C115.3	To understand the basics of BJT and detailed study of its characteristics

		C115.4	To understand and detailed study of JFET&MOSFET
		C115.5	To understand the working of rectifier
		C115.6	Voltage and currents can be measured and monitored using electronic measuring instruments
16	PH110Engineering Physics Lab	C116.1	Develop analytical/experimental skills and impart prerequisite hands-on experience for engineering laboratories
		C116.2	Understand the need for precise measurement practices for data recording
		C116.3	Understand the principle, concept, working and applications of relevant technologies and comparison of results with theoretical calculations
		C116.4	Analyse the techniques and skills associated with modern scientific tools such as lasers and fibre optics
		C116.5	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results
		C116.6	To apply the concepts of laser technology in various devices
17	CE110Civil Workshop	C117.1	Student should be able to set out a building using tape
		C117.2	Student should be able to set out a building using cross staff
		C117.3	Student should be able to determine area and mass moment of inertia of
		C117.4	to construct one and a half and two brick walls using English bond
		C117.5	Student should be able to calculate the area and volume of various features o f a building
		C117.6	Student should be able to determine the compressive strength of brick and cement mortar cubes using compression testing machine
18	EC110Electrical Workshop	C118.1	Graduates will be able to recognize the appropriate methods to solve electronics and communication problems.
		C118.2	Graduates will be able to acquire basic training and skills to solve basic electronics problems.
		C118.3	Graduates will be able to apply the equations and formulas to solve related practical value problems.
		C118.4	Graduates will be able to calculate the problems in Diodes, biasing of transistor, amplifiers, oscillators and regulator circuits.
		C118.5	Graduates will be able to evaluate communication systems like RADAR, GPS, Entertainment Electronics
		C118.6	Graduates will be able to measure current voltage values using equipment and to analyse a waveform
19	MA201 Linear Algebra & Complex	C201.1	Graduates will be able to identify the analytic functions and harmonic functions.
		C201.2	Graduates will be able to understand the conformal mappings and to find regions that are mapped under certain Transformations
		C201.3	Graduates will be able to evaluate the complex integrals

		C201.4	Graduates will be able to evaluate the complex integrals as an applications of residue theorems
		C201.5	Graduates will be able to understand the concept of vector space, to solve the system of linear equations .
		C201.6	Graduates will be able to and to evaluate the Eigen value, Eigen vectors of a matrix and diagonalize a matrix.
20	EE201 Circuits and Networks	C202.1	Students will be able to write equations and solve any DC and AC circuits using Network Theorems
		C202.2	Students will be able to use graph theory in solving networks
		C202.3	Students will be able to understand the concept of transient response
		C202.4	Students will be able to explain the transient response of any circuit using Laplace Transform
		C202.5	Students will be able to analyse the performance of two port networks using network parameters
		C202.6	Students will be able to combine networks using Foster & Cauer Form
21	EE203 Analog Electronic Circuits	C203.1	Compare various positional number systems and binary codes
		C203.2	Apply Boolean algebra in logic circuit design
		C203.3	Design combinational and sequential circuits
		C203.4	Design and implement digital systems using basic programmable blocks
		C203.5	Formulate various digital systems using HDL
		C203.6	Designing of Finite state Machine
22	EE205 DC Machines and Transformers	C204.1	Understand electrical principle, laws, and working of DC machines.
		C204.2	Identify dc generator types, and appreciate their performance
		C204.3	Describe the principle of operation of dc motor and select appropriate motor types for different applications and analyse the performance of different types of dc motors
		C204.4	Describe the principle of operation of single-phase transformers
		C204.5	Analyse the performance of single-phase transformers.
		C204.6	Familiarize with the principle of operation and performance of three phase transformers.
23	EE207 Computer Programming	C205.1	Students will be able to analyse a problem, find appropriate programming language construct should be used and implement C program.
		C205.2	Students gain sufficient awareness about latest software tools.
		C205.3	Students are able to develop programs in C for common problems of reasonable complexity.
		C205.4	Students are able to implement algorithms studied in the course Computer Programming.
		C205.5	Students are able to learn the implementation of control structures, Iterations and recursive functions.
		C205.6	Students are able to implement operations on different types of files.

24	HS 200 Business Economics	C206.1	To familiarize the prospective engineers with elementary Principles of Economics and Business Economics.
		C206.2	To acquaint the students with tools and techniques that are useful in their profession in Business Decision Making which will enhance their employability
		C206.3	To apply business analysis to the “firm” under different market conditions
		C206.4	To apply economic models to examine current economic scenario and evaluate policy options for addressing economic issues
		C206.5	To gain understanding of some Macroeconomic concepts to improve their ability to understand the business climate
		C206.6	To prepare and analyse various business tools like balance sheet, cost benefit analysis and rate of returns at an elementary level
25	EE231 Electronic Circuits Lab	C207.1	To understand VI Characteristics of rectifier and Zener diodes
		C207.2	To Understand RC integrating and differentiating circuits
		C207.3	To Understand Characteristics of BJT in CE configuration and evaluation of parameters
		C207.4	Able to design Feedback amplifiers (current series, voltage series) - gain and frequency response
		C207.5	Able to design Low frequency oscillators –RC phase shift, Wien bridge,
		C207.6	Able to design Multivibrators -A stable, Monostable and Bistable
26	EE233 Programming Lab	C208.1	Students will be able to analyse a problem, find appropriate programming language construct should be used and implement C program.
		C208.2	Students gain sufficient awareness about latest software tools.
		C208.3	Students are able to develop programs in C for common problems of reasonable complexity.
		C208.4	Students are able to implement algorithms studied in the course Computer Programming.
		C208.5	Students are able to learn the implementation of control structures, Iterations and recursive functions.
		C208.6	Students are able to implement operations on different types of files.
27	MA202 Probability Distributions, Transforms and Numerical Methods	C209.1	Graduates will have a concept of discrete probability density functions
		C209.2	Graduates will have a concept of continuous probability density functions
		C209.3	Graduates will get an idea about the Laplace transforms and will be able to apply them in their engineering branches
		C209.4	Graduates will get an idea about the Fourier transforms and will be able to apply them in their engineering branches
		C209.5	Graduates will have a concept of numerical methods for iteration and interpolation and their applications in solving Engineering problems
		C209.6	Graduates will have a concept of numerical methods to solve system of linear equations and numerical integration, and their applications in solving Engineering problems
28		C210.1	Identify alternator types, and appreciate their performance

	EE202 Synchronous and Induction Machines	C210.2	Determine the voltage regulation and analyse the performance of alternators
		C210.3	Describe the principle of operation of synchronous motor and different applications.
		C210.4	Describe the principal operation of 3 phase induction motor and select appropriate motor types for different application
		C210.5	Analyse the performance of 3-phase induction motors
		C210.6	Familiarize with principle of operation and application of 1 -phase induction motors.
29	EE204 Digital Electronics and Logic Design	C211.1	Familiar with various number systems and Boolean algebra
		C211.2	design and analyse any digital logic gate circuits and Flip flop-based systems.
		C211.3	Familiar with combinational circuits
		C211.4	gain the capability of implementing various counters
		C211.5	describe the operation of ADC and DAC circuits
		C211.6	acquire basic knowledge on VHDL
30	EE206 Material Science	C212.1	Describe the characteristics of conducting and semiconducting materials
		C212.2	Classify magnetic materials and describe different laws related to them
		C212.3	Classify and describe different insulators and to explain the behaviour of dielectrics in static and alternating fields
		C212.4	Describe the mechanisms of breakdown in solids, liquids and gases
		C212.5	Classify and describe Solar energy materials and superconducting materials
		C212.6	Gain knowledge in the modern techniques for material studies
31	EE208 Measurements and Instrumentation	C213.1	To demonstrate an understanding of the fundamentals of (feedback) control systems.
		C213.2	To determine the time domain responses of first and second-order systems to step and sinusoidal (and to some extent, ramp) inputs.
		C213.3	To understand the basic knowledge necessary for system stability
		C213.4	To apply root-locus technique to analyse and design control systems.
		C213.5	To provide knowledge in the frequency response analysis of linear time invariant systems
		C213.6	To apply polar plot technique to analyse and design control systems.
32	HS210/HS200Life Skills/Business Economics	C214.1	Define and identify different life skills required in personal and professional life
		C214.2	Develop an awareness of the self and apply well-defined techniques to cope with emotions and stress.

		C214.3	Explain the basic mechanics of effective communication and demonstrate these through presentations
		C214.4	Take part in group discussions
		C214.5	Use appropriate thinking and problem-solving techniques to solve new problems
		C214.6	Understand the basics of teamwork and leadership
33	EE232 Electrical Machines Lab I	C215.1	To Analyse the characteristics of different dc generators
		C215.2	To understand the performance of DC motors
		C215.3	To Separate the losses in dc motors
		C215.4	To Analyse the performance of different types of dc motors
		C215.5	To Determine the performance characteristics of single-phase transformers
		C215.6	To Compare the performance of transformers in different modes of operations and connections
34	EE234 Circuits and Measurements Lab	C216.1	Analyse voltage current relations of RLC circuits
		C216.2	Verify DC network theorems by setting up various electric circuits
		C216.3	CO 3 Measure power in a single and three phase circuits by various methods
		C216.4	Calibrate various meters used in electrical systems
		C216.5	Determine magnetic characteristics of different electrical devices
		C216.6	CO 6 Analyse the characteristics of various types of transducer systems
		C216.7	Determine electrical parameters using various bridges
		C216.8	Analyse the performance of various electronic devices for an instrumentation
35	EE301 Power Generation, Transmission and Protection	C301.1	systems and, to develop the team management and documentation capabilities.
		C301.2	Students will be able to learn about various transmission line constants (Resistance, Inductance and capacitance).
		C301.3	Students will be able to do the performance analysis of transmission lines. Students will be able to perform the mechanical designing of overhead lines and underground cables.
		C301.4	Students will be able to write about the HVDC transmission and FACTS controllers
		C301.5	Students will be able to list various circuit breakers and relays used in power system
		C301.6	Students will be able to summarize the protection schemes for generator, transformer, motor, feeder and transmission lines
36	EE303 Linear Control Systems	C302.1	To demonstrate an understanding of the fundamentals of (feedback) control systems.
		C302.2	To determine the time domain responses of first and second-order systems to step and sinusoidal (and to some extent, ramp) inputs.
		C302.3	To understand the basic knowledge necessary for system stability
		C302.4	To apply root-locus technique to analyse and design control systems.

		C302.5	To provide knowledge in the frequency response analysis of linear time invariant systems
		C302.6	To apply polar plot technique to analyse and design control systems.
37	EE305 Power Electronics	C303.1	Choose appropriate power semiconductor device in converter circuits and develop their triggering circuits
		C303.2	Analyse various types of power electronic converters and apply different switching techniques
		C303.3	Select appropriate power converter for specific applications
		C303.4	Analyse various types of inverters and their mode of conduction
		C303.5	To get an overview of voltage control in inverters
		C303.6	Interpret and use datasheets of power semiconductor devices for design.
38	EE307 Signals and Systems	C304.1	Represent various signals and systems
		C304.2	Analyse the continuous time system with Laplace transform
		C304.3	Represent and analyse signals using Fourier representation
		C304.4	Analyse the discrete time system using ZT
		C304.5	Analyse the DT systems with DFS
		C304.6	Acquire basic knowledge in nonlinear systems
39	EE309 Microprocessor and Embedded Systems	C305.1	To give an understanding on the Microprocessor 8085 and programming
		C305.2	To program 8085 microprocessors
		C305.3	To impart an insight into the architecture of 8051 microcontroller
		C305.4	To develop sound understanding about programming and interfacing of 8051 microcontroller.
		C305.5	To give an understanding on the embedded system
		C305.6	To design an embedded system for different applications
40	EE367 New and Renewable energy sources	C306.1	Identify and classify the types of renewable and non-renewable energy systems
		C306.2	Illustrate the basic principles of solar thermal systems
		C306.3	Elucidate the working of solar electric systems
		C306.4	Understand tidal energy and its limitations
		C306.5	Identify Winds energy as alternate form of energy and to know how it can be tapped
		C306.6	Illustrate the basic principles of biogas mechanism and working of small hydro power plants
41	EE341 Design Project	C307.1	The students will be able to think innovatively on the development of components, products in the engineering field
		C307.2	The students will be able to think innovatively on the development of components, processes or technologies in the engineering field
		C307.3	The students will be able to analyse the problem requirements and arrive workable design solutions

		C307.4	The students will be able to understand the engineering aspects of design with reference to simple products to assess its impact on the society, health, environment and safety
		C307.5	The students will be able to understand the engineering aspects of process or technologies with reference to simple products to assess its impact on the society, health, environment and
		C307.6	The students will be able to develop design that add value to products and solve technical problems
42	EE331 Digital Circuits and Embedded Systems Lab	C308.1	Design, setup and analyse various digital circuits.
		C308.2	Students will be able to program and explain 8085 microprocessors for different applications
		C308.3	Students will be able to program and use advanced microprocessors
		C308.4	Students will be able to program and interface 8051 microcontrollers
		C308.5	Students will be able to combine different system for a practical application
		C308.6	students will be aware of LED and LCD display interfacing
43	EE333 Electrical Machines Lab II	C309.1	To study the various calculation of regulations method used in AC alternator
		C309.2	To understand the Active and reactive power control in grid connected alternator
		C309.3	To study the performance characteristics and speed control technique employed induction motor.
		C309.4	To study the performance characteristics of various types of AC machine
		C309.5	To study the Performance characteristics of induction generator
		C309.6	To study the equivalent circuit of synchronous motor and induction motor
44	EE302 Electromagnetics	C310.1	Analyse fields and potentials due to static charges
		C310.2	Explain the physical meaning of the differential equations for electrostatic and magnetic fields
		C310.3	Understand how materials are affected by electric and magnetic fields
		C310.4	Understand the relation between fields under time varying situations
		C310.5	Understand principles of propagation of uniform plane waves
		C310.6	Outline electromagnetic interference and compatibility
45	EE304 Advanced Control Theory	C311.1	To design compensators using frequency domain specifications.
		C311.2	To design compensators using time domain specifications.
		C311.3	To analyse linear using state space analysis.
		C311.4	To design controllers and observers.
		C311.5	To analyse nonlinear system using state space analysis.
		C311.6	To analyse the stability of discrete system and nonlinear system.
46	EE306 Power System Analysis	C312.1	Graduates will be able to explain the model circuits of power system components and per unit systems.

		C312.2	Graduates will be able to perform analysis of power systems subject to symmetrical and unsymmetrical faults.
		C312.3	Graduates will be capable of defining, explaining, establishing and solving equations for power flows based on nodal admittance and impedance matrix.
		C312.4	Graduates can explain the concepts of automatic generation control, load frequency control and automatic voltage control.
		C312.5	Graduates can outline the principles of economic load dispatch and unit commitment.
		C312.6	Graduates will be able to analyse the power system stability criterion.
47	EE308 Electric Drives	C313.1	Graduate will be able to select the drives as per requirement.
		C313.2	Graduate will be able to understand the basics of AC drives and design
		C313.3	Graduate will be able to understand the various control technique employed in AC drive
		C313.4	Graduate will be able to understand the basics of DC drives and design
		C313.5	Graduate will be able to understand the various control technique employed in DC drive
		C313.6	Graduate will gain knowledge in application and basic transformation theory synchronous motor drives
48	HS300 Principles of Management	C314.1	To recall and identify the relevance of management concepts
		C314.2	To describe, discuss and relate management techniques adopted within an organization
		C314.3	To apply management techniques for meeting current and future management challenges faced by the organization
		C314.4	To compare the management theories and models critically and to inspect and question its validity in the real world
		C314.5	To assess and modify different theories of management so as to relate it to current management challenges
		C314.6	To apply principles of management in order to execute the role as a manager
49	EE372 Biomedical Instrumentation	C315.1	Students will be able to Compare different types bio electric potentials
		C315.2	Students will be able to Familiarize different types of biopotential electrodes and working of ECG machine
		C315.3	Students will be able to Understand different methods of measurement of blood pressure and heart beat
		C315.4	Students will be able to Describe different pacemakers, EMG, EEG and respiratory parameter measurement
		C315.5	Students will be able to Understand different types of ventilators-Ray machine and Ultrasonic imaging systems
		C315.6	Students will be able to Understand different instruments for clinical laboratory, electrical safety and method of accident prevention
50	EE332 Systems and Control Lab	C316.1	Students will be able to Develop mathematical models for servomotors and other electrical systems
		C316.2	Students will be able to Performance analysis of different process control systems
		C316.3	Students will be able to Performance analysis of different types of controllers
		C316.4	Students will be familiar with MATLAB and SIMULINK to design and analyse simple systems and compensator

		C316.5	Students will be able to Analyse the performance characteristics and response of temperature/ Flow/ Level control systems.
		C316.6	Students will be able to Realize various types of synchro and its transmitter and receiver analysis.
51	EE334 Power Electronics & Drives Lab	C317.1	Graduates will be able to identify and explain different circuits and corresponding waveforms in power electronic circuits
		C317.2	provide experience on design and analysis of power electronic circuits used for power electronic applications.
		C317.3	Graduates will be able to select a firing circuit based on the application
		C317.4	Graduates will be able to recognize various power semiconductor devices that are used in power electronic applications
		C317.5	Graduates will learn to assess basic concepts used to model different power electronic circuits.
		C317.6	Graduates can recall the basic concepts which can be applied in advanced power electronic circuits
52	EE352 Comprehensive Exam	C318.1	The students will be confident in discussing the fundamental aspects of any engineering problem/situation and give answers in dealing with them
		C318.2	Students will be able to analyse the system and can find solutions to various fundamental issues.
53	EE401 Electronic Communication	C401.1	Understand the need of modulation in transferring a signal through either wireless or wired communication systems
		C401.2	Be able to apply analog modulation techniques and receiver fundamentals in analog communication.
		C401.3	Be to apply baseband digital encoding & decoding techniques in the storage / transmission of digital signal through wired channel and understand the performance of communication systems in the presence of noise and interference
		C401.4	Understand the fundamentals of Television and Radar Engineering.
		C401.5	Understand the Concept of satellite communication and fibre
		C401.6	Understanding the fundamentals of Cellular Telephone Concepts and modern transmission devices such as Zig-Bee, GPS, Wi-Fi, Wi-Max
54	EE403 Distributed Generation and Smart Grids	C402.1	Explain the concepts of distributed generation, smart grids and microgrids
		C402.2	Outline different distributed energy resources and control of microgrid
		C402.3	Illustrate the coordinated operation of smart grid and the use of smart meters
		C402.4	Acquire knowledge on energy storage devices in smart grid
		C402.5	Analyse the performance of smart grid and smart substation
		C402.6	Explain power quality aspects with smart grid
55	EE405 Electrical System Design	C403.1	Students will be able to explain about the standards of BIS and scope and safety aspects
		C403.2	Impart knowledge in the design of low voltage and medium voltage electrical installations.
		C403.3	Basic knowledge of design of distribution transformer substations, their installations and earthing design for transformer substations

		C403.4	Students will have knowledge about the Pre-commissioning tests of cables, transformers and short circuit calculations
		C403.5	Familiarise lighting calculations and external lighting.
		C403.6	Students will have awareness about the energy conservation technologies and PV systems
56	EE407 Digital Signal Processing	C404.1	To provide an understanding of the fundamental concepts and applications of DSP
		C404.2	To introduce and implement the efficient computation techniques involved in DSP
		C404.3	To study the design techniques for digital FIR filters
		C404.4	To study the design techniques for digital IIR filters
		C404.5	To know about the computer architecture for digital signal processors
		C404.6	To give an understanding of multi-rate signal processing and its applications
57	EE409 Electrical Machine Design	C405.1	Understand the basic principle of machine design, magnetic circuit calculation and magnetic leakage calculation
		C405.2	Study the design of various types of transformers
		C405.3	Design the dc machine and its various parts of the machine
		C405.4	Ability to design the synchronous machine dimension and field winding
		C405.5	Study the stator and rotor design of three phase induction motor and slip ring motor
		C405.6	Introduction of computer aided design and finite element method
58	EE465 Power Quality	C406.1	students will be able to identify the power quality problems
		C406.2	Students will be able to understand various sources of power quality problems
		C406.3	Students will be able to analyse the problems relating to power quality
		C406.4	Students will be able to list various Power quality Monitoring considerations
		C406.5	Students will be able to understand various Harmonic elimination techniques
		C406.6	Students will be able to know Power Quality Management in Smart Grid:
59	EE451 Seminar	C407.1	Present seminar in the latest field of electrical and electronics engineering
		C407.2	Communicate effectively, the subjects learned in the form of seminar presentation
		C407.3	Communicate effectively, the modern trends in the field of electrical and electronics engineering
		C407.4	Apply the fundamentals of mathematics, science and engineering knowledge to identify, formulate, design and investigate complex engineering problems of electrical and electronics engineering and allied applications.
		C407.5	Apply appropriate techniques and modern engineering hardware and software tools in electrical and electronics engineering and allied applications

		C407.6	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues with societal and environmental context, applying ethical principles in the field of electrical and electronics engineering and allied applications
60	EE431 Power System Lab	C408.1	Analyse the faults of power system networks on any dedicated software platform to solve a symmetrical and unsymmetrical fault and to verify by manual calculation.
		C408.2	Determine critical clearing angle by applying equal area criterion for any power system network and verify the same using any dedicated software
		C408.3	Determine the change in speed, frequency and steady state error corresponding to a load disturbance in a single area power system, with and without supplementary control using any software
		C408.4	testing the pickup, drop out and plot the time current characteristics of the relay.
		C408.5	measurement of the dielectric strength of the given sample of Transformer oil.
61	EE402 Special Electric Machines	C409.1	Understand the basic principle, construction and operation of Ac and Dc servo motor and its application
		C409.2	Study the basic principle, different type, its characteristics and application
		C409.3	Study the single phase special electrical machine, its characteristics and its applications
		C409.4	Study the operation of reluctance motors, characteristics and its application
		C409.5	Study the operation of permanent magnet motors, characteristics and its application
		C409.6	Study the operation of linear motors, characteristics and its application
62	EE404 Industrial Instrumentation & Automation	C410.1	Students will be able to select instruments and transducers for various physical variables.
		C410.2	Students will get an insight on data acquisition, processing and monitoring system
		C410.3	Students can design various signal conditioning systems for transducers.
		C410.4	Students will be able to analyse dynamic responses of various systems
		C410.5	Students will get the concepts of virtual instrumentation
		C410.6	Students will be familiarized with the programming realization of PLC
63	EE474 Energy Management and Auditing	C411.1	Explain the principles of energy audit, its planning, peak demand control methods and types of loads and optimal scheduling.
		C411.2	Illustrate the energy management opportunities in various electrical systems
		C411.3	Exemplify the energy management opportunities in various thermal systems
		C411.4	Demonstrate the energy management opportunities in various HVAC and WHR systems
		C411.5	Elucidate the various types of energy audits and cogeneration systems
		C411.6	Utilize the various economic analysis methods for energy management
64	IE 488 Total Quality Management	C412.1	To recall and identify the relevance of management concepts
		C412.2	To describe, discuss and relate management techniques adopted within an organization

		C412.3	To apply management techniques for meeting current and future management challenges faced by the organization
		C412.4	To compare the management theories and models critically and to inspect and question its validity in the real world
		C412.5	To assess and modify different theories of management so as to relate it to current management challenges
		C412.6	To apply principles of management in order to execute the role as a manager
65	EE492 Project	C413.1	To give a platform for the students to apply the theoretical knowledge they gained during the course and conduct analysis and create working models.
		C413.2	To enable the students to use different design platforms for design and analysis of project.
		C413.3	To give a chance to improve communication skills and enable the students to express the theoretical knowledge to defend
		C413.4	To impart theoretical knowledge about wind tunnels and experimental fluid mechanics.
		C413.5	To give the students a feel of working in a team environment and contribute to the success of the project.
		C413.6	To enrich and develop the industrial working environment to students

CONSOLIDATED LIST OF COURSE OUTCOMES

Department of Mechanical Engineering

Sl. No	Course Code & Course Name	Course Outcome Number	Course Outcome
1	MA101 CALCULUS	C101.1	Knowledge about concept and importance of sustainability
		C101.2	Understand about different types of pollution and waste generation, their causes effects and control
		C101.3	Understand environmental management standards and environmental impact assessment
		C101.4	Understand the concept of bio mimicking, green Engineering and green building
		C101.5	Knowledge about various types of conventional and non-conventional energy sources
		C101.6	Understand the role of engineering and technology in sustainable development
2	PH100 - ENGINEERING PHYSICS	C102.1	Compute the quantitative aspects of waves and oscillations in engineering systems.
		C102.2	Apply the interaction of light with matter through interference, diffraction and identify these phenomena in different natural optical processes and optical instruments.
		C102.3	Analyse the behaviour of matter in the atomic and subatomic level through the principles of quantum mechanics to perceive the microscopic processes in electronic devices.
		C102.4	Apply the knowledge of ultrasonics in non-destructive testing and use the principles of acoustics to explain the nature and characterization of acoustic design and to provide a safe and healthy environment
		C102.5	Apply the comprehended knowledge about laser and fibre optic communication systems in various engineering applications
		C102.6	Using the knowledge of acoustics in designing acoustically important Buildings.
3	BE100 - ENGINEERING MECHANICS	C103.1	Solve problems dealing with forces and determine the resultant. Also Identify the forces acting on a body and draw the free body diagram
		C103.2	Solve problems on forces acting on a body in space. Also determine the support reactions of beams subjected to concentrated loads and uniformly distributed loads
		C103.3	Determine the centroid and moment of inertia of composite areas.
		C103.4	Analyse the concept of friction to solve problems of bodies placed on rough surfaces and solve problems on support reactions of beams using principle of virtual work.
		C103.5	Use Newton's second law to solve problems on bodies in motion and apply the concept of instantaneous centre to bodies having combined translation and rotation.
		C103.6	Knowledge on types of Vibration and solve problem using the concept of Simple Harmonic Motion

4	BE10102 - INTRODUCTION TO MECHANICAL ENGINEERING	C104.1	Acquire knowledge on fundamental concepts of thermodynamics and laws of thermodynamics.
		C104.2	Use energy conservation devices from the knowledge of the energy conversion device.
		C104.3	Select and use an appropriate refrigeration and air conditioning systems
		C104.4	Develop and implement basic ideas of the different parts, working of automobile and fundamentals of aerodynamics
		C104.5	Preparation and ability to engage in independent and life-long learning in the context of knowledge on engineering materials.
		C104.6	Select and use the different manufacturing methods
5	BE103 - INTRODUCTION TO SUSTAINABLE ENGINEERING	C105.1	Knowledge about concept and importance of sustainability
		C105.2	Understand about different types of pollution and waste generation, their causes effects and control
		C105.3	Understand environmental management standards and environmental impact assessment
		C105.4	Understand the concept of bio mimicking, green Engineering and green building
		C105.5	Knowledge about various types of conventional and non-conventional energy sources
		C105.6	Understand the role of engineering and technology in sustainable development
6	EC100 - BASICS OF ELECTRONICS ENGINEERING	C106.1	To understand and identify passive components
		C106.2	Student can identify active components and can design, setup simple circuits using diodes
		C106.3	To understand the basics of BJT and detailed study of its characteristics
		C106.4	To understand and detailed study of JFET&MOSFET
		C106.5	To understand the working of rectifier
		C106.6	Voltage and currents can be measured and monitored using electronic measuring instruments
7	PH110 - ENGINEERING PHYSICS LAB	C107.1	Develop analytical/experimental skills and impart prerequisite hands-on experience for engineering laboratories
		C107.2	Understand the need for precise measurement practices for data recording
		C107.3	Understand the principle, concept, working and applications of relevant technologies and comparison of results with theoretical calculations
		C107.4	Analyse the techniques and skills associated with modern scientific tools such as lasers and fibre optics
		C107.5	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results
		C107.6	To apply the concepts of laser technology in various devices

8	ME110 - MECHANICAL ENGINEERING WORKSHOP	C108.1	Knowledge achieved to explain the various manufacturing process in the basic mechanical engineering workshop sections- smithy, carpentry, assembling, welding etc.
		C108.2	Identify the various hand tools used in the basic mechanical engineering workshop sections-smithy, carpentry, assembling, welding etc.
		C108.3	Able to choose different measuring devises according to the work.
		C108.4	Ability to name and summarize the operations of various machine tools like lathe, milling, drilling and shaping machines.
		C108.5	Knowledge achieved to disassemble and assemble the machines like IC engines.
		C108.6	Skill achieved to construct models by using basic mechanical workshop sections like welding, moulding, smithy, carpentry etc.
9	EC110 - ELECTRONICS ENGINEERING WORKSHOP	C109.1	Graduates will be able to recognize the appropriate methods to solve electronics and communication problems.
		C109.2	Graduates will be able to acquire basic training and skills to solve basic electronics problems.
		C109.3	Graduates will be able to apply the equations and formulas to solve related practical value problems.
		C109.4	Graduates will be able to calculate the problems in Diodes, biasing of transistor, amplifiers, oscillators and regulator circuits.
		C109.5	Graduates will be able to evaluate communication systems like RADAR, GPS, Entertainment Electronics
		C109.6	Graduates will be able to measure current voltage values using equipment and to analyse a waveform
10	MA102 - DIFFERENTIAL EQUATIONS	C110.1	Graduates will be able acquire basic knowledge of homogeneous differential equations and methods of solving them.
		C110.2	Graduates will be able acquire basic knowledge of non-homogeneous differential equations and methods of solving them.
		C110.3	Graduates will be able to apply Fourier series for analysing periodic functions in terms of their frequency components.
		C110.4	Graduates will be able form and solve using partial differential equations
		C110.5	Graduates will be able to Identify, analyse and subsequently solve the distribution of heat problems whose behaviour can be described by differential equations.
		C110.6	Graduates will be able to Identify, analyse and subsequently solve the waves whose behaviour can be described by differential equations.

11	CY100 - ENGINEERING CHEMISTRY	C111.1	Understand various spectroscopic techniques like UV-Visible, IR, NMR and its applications.
		C111.2	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields.
		C111.3	Basic knowledge of Thermal analytical techniques and conductivity measurements. Basic knowledge of chromatographic techniques.
		C111.4	Have a scope in the area of material science. Have knowledge of synthesizing nano materials and their application in industry, carbon nano tube technology in every industry now a days.
		C111.5	Have knowledge of chemical properties of fuels. Know the properties of lubricants.
		C111.6	Study various types of water treatment methods to develop skills for treating wastewater.
12	BE110 - ENGINEERING GRAPHICS	C112.1	Draw the projection of points and lines located in different quadrants
		C112.2	Prepare Multiview orthographic projections of objects by visualizing them in different positions
		C112.3	Draw sectional views and develop surfaces of a given object
		C112.4	Prepare pictorial drawings using the principles of isometric and perspective projections to visualise objects in 3 dimensions.
		C112.5	Convert 3D views to orthographic views and vice versa
		C112.6	Obtain Multiview projections and solid models of objects using CAD tools
13	BE102 - DESIGN & ENGINEERING	C113.1	Graduates will be able to classify and experiment different stages in design with their significance
		C113.2	Aware of the product oriented and user-oriented aspects that make the design a success.
		C113.3	The students will be able to identify & initiate different creative designs.
		C113.4	Enable the students to analyse the prototype models needed for development of project
		C113.5	Graduates will be able to Select the design requirements for designing various products.
		C113.6	The students can evaluate the product based on intellectual property rights
14	CE100 - BASICS OF CIVIL ENGINEERING	C114.1	The students will be able to illustrate the fundamental aspects of Civil engineering
		C114.2	The students will be able to plan and set out a building
		C114.3	Students will be able to explain the concepts of surveying for making horizontal and vertical measurements.
		C114.4	They will able to illustrate the uses of various building materials and explain the method of construction of different components of a building.
		C114.5	Students will be able to illustrate the uses of various building elements.
		C114.6	Students will be able to discuss about various services in a building.

15	EE100 - BASICS OF ELECTRICAL ENGINEERING	C115.1	Students will be able to acquire fundamental knowledge of Electrical circuits and solve circuit related problems.
		C115.2	Students will be able to recall and state ideas about magnetic circuits.
		C115.3	Students will be able to explain the fundamentals of AC circuits.
		C115.4	Students will be able to analyse three phase systems.
		C115.5	Students will be able to compare and contrast various types of resonance circuits
		C115.6	Students will be able to identify and differentiate between various methods of Power measurement
16	CY110 - ENGINEERING CHEMISTRY LAB	C116.1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses
		C116.2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs
		C116.3	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR spectra of some organic compounds
		C116.4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis
		C116.5	Learn to design and carry out scientific experiments and accurately record & analyse results of such experiments
		C116.6	Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social, economic and environmental problems and why it is an integral part of curriculum
17	CE110 - CIVIL ENGINEERING WORKSHOP	C117.1	Student should be able to set out a building using tape
		C117.2	Student should be able to set out a building using cross staff
		C117.3	Student should be able to determine area and mass moment of inertia
		C117.4	To construct one and a half and two brick walls using English bond
		C117.5	Student should be able to calculate the area and volume of various features of a building
		C117.6	Student should be able to determine the compressive strength of brick and cement mortar cubes using compression testing machine
18	EE110 - ELECTRICAL ENGINEERING WORKSHOP	C118.1	Students will be able to recognize supply arrangements and their limitations, standard voltages and their tolerances, safety aspects of electrical systems and importance of protective measures in wiring systems.
		C118.2	Students will identify the types of wires, cables and other accessories used in wiring.
		C118.3	Students should be able to wire up and predict estimate of simple lighting circuits for domestic buildings and distinguish between light and power circuits
		C118.4	Students will be able to measure electrical circuit parameters like current, voltage and power in a circuit.
		C118.5	Students will be able to explain the usage of Multimeters and LCR Q meters
		C118.6	Creating awareness of energy conservation in electrical systems.

19	MA201 - LINEAR ALGEBRA & COMPLEX ANALYSIS	C201.1	Graduates will be able to identify the analytic functions and harmonic functions.
		C201.2	Graduates will be able to understand the conformal mappings and to find regions that are mapped under certain Transformations
		C201.3	Graduates will be able to evaluate the complex integrals.
		C201.4	Graduates will be able to evaluate the complex integrals as an applications of residue theorems
		C201.5	Graduates will be able to understand the concept of vector space, to solve the system of linear equations
		C201.6	Graduates will be able to and to evaluate the Eigen value, Eigen vectors of a matrix and diagonalize a matrix.
20	ME201 - MECHANICS OF SOLIDS	C202.1	To understand basic concepts of stress and strain in solids and apply this knowledge during the analysis of thermal stresses and statically indeterminate structures
		C202.2	Students will be able to demonstrate the ability to select appropriate shaft size by applying the principles of torsion
		C202.3	Students will be able to depict and analyse the shear force and bending moment develops in a beam while solving complex problems.
		C202.4	Student will be able to determine the bending stress and shear stress in beams and can select the appropriate geometry for the requirement
		C202.5	Student will be able to develop the governing differential equation for the elastic curve, and apply different techniques for finding out the deflection at required points
		C202.6	Student will be able to calculate the buckling load for columns with different end conditions.
21	ME203 - MECHANICS OF FLUIDS	C203.1	Ability to calculate pressure variations in accelerating fluids using Euler's and Bernoulli's equations.
		C203.2	Become conversant with the concepts of flow measurements and flow through pipes and be able to describe them.
		C203.3	Apply the momentum equations to fluid flow problems based on an analysis of the various system specifications (i.e., Viscid, inviscid, rotational, irrotational, steady,
		C203.4	Apply the energy equations to fluid flow problems based on an analysis of the various system specifications (i.e., Viscid, inviscid, rotational, irrotational, steady,
		C203.5	Evaluate head loss in pipes and conduits and recommend suitable engineering criteria for fluid flow, power transmission, etc..
		C203.6	Use dimensional analysis to design physical or numerical experiments applying dynamic similarity.

22	ME205 - THERMODYNAMICS	C204.1	To understand the basic concepts of thermodynamics. Define energy transfer through heat and work for closed and open systems.
		C204.2	To understand and apply the first law of thermodynamics for closed and open system and to analyse simple problems.
		C204.3	Understand and apply the second law of thermodynamics and entropy concepts for the analysis of thermal systems.
		C204.4	To Understand the concept of pure substance and identify the properties of pure substance on property diagrams. Understand the concepts of available and unavailable energy in thermal systems.
		C204.5	To Understand the concept of mixture of ideal gases and other real gas equations.
		C204.6	To Understand the property relationship of thermodynamic fluids; also, to understand the concepts of thermochemistry and various parameters involved in combustion.
23	ME210 - METALLURGY AND MATERIALS ENGINEERING	C205.1	Students will be able to identify the crystal structures of metallic materials.
		C205.2	Students will be able to identify the crystal structures of metallic materials.
		C205.3	Students will be able to apply the microstructure with properties, processing and performance of metals
		C205.4	Students will be able to analyse the failure of metals with structural change
		C205.5	Students will be able to recommend materials for design and construction
		C205.6	Students will be able to apply core concepts in materials science to solve engineering problems
24	HS200 - BUSINESS ECONOMICS	C206.1	Knowledge about concept and importance of sustainability
		C206.2	Understand about different types of pollution and waste generation, their causes effects and control
		C206.3	Understand environmental management standards and environmental impact assessment
		C206.4	Understand the concept of bio mimicking, green Engineering and green building
		C206.5	Knowledge about various types of conventional and non-conventional energy sources
		C206.6	Understand the role of engineering and technology in sustainable development
25	ME231 - COMPUTER AIDED MACHINE DRAWING LAB	C207.1	Students able to express the concept of CAD/CAM/CIM and Other terminologies used in the development and manufacturing of a product.
		C207.2	Students able to demonstrate different methods for geometric modelling in CAD.
		C207.3	Students able to evaluate the types of curves used in creating a geometry.
		C207.4	Students able to demonstrate different solid modelling representations used in CAD.
		C207.5	Students able to formulate stiffness matrix to analyse structural and thermal problems
		C207.6	Students analyse structural finite element problems by getting knowledge about various finite element methods.

26	CE230 - MATERIAL TESTING LAB	C208.1	To determine the Modulus of Elasticity of steel and wood using UTM
		C208.2	To verify Clerk- Maxwell's Reciprocal Theorem and hence determine the Modulus of elasticity of steel.
		C208.3	To determine the Modulus of rigidity of steel using torsion test, spring test and torsion pendulum
		C208.4	To analyse the toughness of a specimen using Impact testing machine
		C208.5	To test the hardness of a material by Rockwell, Brinell and Vickers Hardness test
		C208.6	To determine the ultimate shear stress of steel using UTM
27	MA202 - PROBABILITY DISTRIBUTIONS, TRANSFORMS AND NUMERICAL METHODS	C209.1	Graduates have a concept of discrete probability density functions
		C209.2	Graduates have a concept of continuous probability density functions
		C209.3	Graduates get an idea about the Laplace transforms and will be able to apply them in their engineering branches
		C209.4	Graduates will get an idea about the Fourier transforms and will be able to apply them in their engineering branches
		C209.5	Graduates will have a concept of numerical methods for iteration and interpolation and their applications in solving Engineering problems
		C209.6	Graduates will have a concept of numerical methods to solve system of linear equations and numerical integration, and their applications in solving Engineering problems
28	ME202 - ADVANCED MECHANICS OF SOLIDS	C210.1	Graduates will be able to solve elasticity problems in solids using concepts of stress and strain.
		C210.2	Graduates will be solving plane stress and plane strain problems
		C210.3	Able to compute hoop stress and radial stress generated for thick cylinders and rotating discs under pressure
		C210.4	Able to solve general bending problems in unsymmetrical beams
		C210.5	Graduates will acquire basic knowledge on applying energy methods in structural mechanics problems
		C210.6	Graduates will acquire basic knowledge to solve torsional problems of non-circular shafts
29	ME204 - THERMAL ENGINEERING	C211.1	Acquire knowledge of boilers, its working, understand & analyse different steam power cycles and steam nozzles.
		C211.2	Understand working of steam turbines and apply the principles to find solutions to engineering problems regarding the devices
		C211.3	Understand working of various internal combustion engines and understand its underlying thermodynamic cycles
		C211.4	To understand the performance testing of IC engines and evaluate various performance parameters and gain knowledge about IC engine combustion
		C211.5	Gain knowledge of about of air pollution from IC engine, its remedies and understand combustion and design of combustion chambers in IC engines.
		C211.6	To understand and analyse the gas turbine cycle and its modifications and gain knowledge about combustion in gas turbines

30	ME206 - FLUID MACHINERY	C212.1	Students will be able to define the principles and working of Hydraulic Machines
		C212.2	Students will be able to estimate the hydrodynamic forces on various types of vanes and to calculate the performance of various hydraulic machines.
		C212.3	Students will be able to design an appropriate pump/turbine with reference to given application/situation. Carry out calculations involved in design of pump/turbine
		C212.4	Students will be able to understand the relation between various performance parameters and to interpret characteristic curves of a given pump/turbine/compressor
		C212.5	Students will be able to define the principles and working of various type of compressors
		C212.6	Student will be able to study the principles of centrifugal and axial flow compressors
31	ME220 - MANUFACTURING TECHNOLOGY	C213.1	Students will be able to select appropriate manufacturing techniques to produce engineering components.
		C213.2	Students will be able to understand the principles and procedures behind different manufacturing methods and will be able to choose an appropriate method.
		C213.3	Students will have the ability to apply a manufacturing process to develop a product after selecting a proper location method as per a mechanical design
		C213.4	Students will be able to analyse various process parameters involved in a manufacturing process.
		C213.5	Student will be able to predict and identify possible defects and can device methods to produce defect free products.
		C213.6	Students will be able to analyse various process parameters involved in an advanced manufacturing process.
32	HS210 - LIFE SKILLS	C214.1	Knowledge about concept and importance of sustainability
		C214.2	Understand about different types of pollution and waste generation, their causes effects and control
		C214.3	Understand environmental management standards and environmental impact assessment
		C214.4	Understand the concept of bio mimicking, green Engineering and green building
		C214.5	Knowledge about various types of conventional and non-conventional energy sources
		C214.6	Understand the role of engineering and technology in sustainable development
33	ME232 THERMAL ENGINEERING LAB	C215.1	To gain knowledge about the working of different engines and its components.
		C215.2	To conduct appropriate tests on IC engines and reciprocating compressors and determine various performance characteristics
		C215.3	To test fuels and lubricants to determine their properties.
		C215.4	To prepare the heat balance chart of an engine
		C215.5	To evaluate the effect of cooling water flow rate on the performance characteristics of an engine.
		C215.6	To evaluate the effect of engine speed on the performance characteristics of an engine.

34	ME230 FLUID MECHANICS & MACHINES LAB	C216.1	Students will be able to select an appropriate pump/turbine with reference to given application/situation
		C216.2	Students will be able to estimate the optimum efficiency of a given pump/turbine under different load and (or) speed conditions
		C216.3	Students will be able to apply the fundamental principles of fluid mechanics in calculations involving basic flow measuring devices in both closed and open channel flows
		C216.4	Students will be able to analyse the trends depicted by characteristic curves obtained from the experiments
		C216.5	Students will be able to predict the stability of a floating vessel following the principles of metacentric height and radius of gyration
35	ME301 - MECHANICS OF MACHINERY	C301.1	Knowledge in different types of mechanisms and their inversions. How to calculate their degrees of freedom.
		C301.2	Knowledge to conduct velocity and acceleration analysis of mechanisms.
		C301.3	Knowledge to develop a cam for a specified follower motion.
		C301.4	Knowledge in gear terminologies.
		C301.5	Knowledge to calculate velocity of gears in a gear train.
		C301.6	Conduct synthesis of mechanism, and to design a mechanism for a specified output motion.
36	ME303 - MACHINE TOOLS & DIGITAL MANUFACTURING	C302.1	Evaluate the mechanism of orthogonal and oblique cutting and analyse the cutting forces developed.
		C302.2	Select appropriate process parameters in a machine tool while machining a job.
		C302.3	Understand and apply operational principles of machine tools.
		C302.4	Select different machining operation operations
		C302.5	Select different super finishing operations
		C302.6	Understand and apply the principles of digital manufacturing.
37	ME305 - COMPUTER PROGRAMMING & NUMERICAL METHODS	C303.1	Students able to express the concept of CAD/CAM/CIM and Other terminologies used in the development and manufacturing of a product.
		C303.2	Students able to demonstrate different methods for geometric modelling in CAD.
		C303.3	Students able to evaluate the types of curves used in creating a geometry.
		C303.4	Students able to demonstrate different solid modelling representations used in CAD.
		C303.5	Students able to formulate stiffness matrix to analyse structural and thermal problems
		C303.6	Students analyse structural finite element problems by getting knowledge about various finite element methods.

38	EE311 - ELECTRICAL DRIVES & CONTROL FOR AUTOMATION	C304.1	Students will be able to explain the principle of electrical machines and their applications
		C304.2	Students will be able to apply the principle of electrical drives & be able to understand the dynamics of electrical drive systems.
		C304.3	Students will be able to select a drive for a particular application based on power rating & to select a drive based on mechanical characteristics for a particular drive application.
		C304.4	Students will be able to identify solid state drive for speed control of various special electrical machines.
		C304.5	Students will be able to design speed control of induction motor drives in an energy efficient manner using power electronics & be able to learn the control system for synchronous motor drives
		C304.6	Discuss the controllers used for automation
39	HS300 - PRINCIPLES OF MANAGEMENT	C305.1	To recall and identify the relevance of management concepts
		C305.2	To describe, discuss and relate management techniques adopted within an organization
		C305.3	To apply management techniques for meeting current and future management challenges faced by the organization
		C305.4	To compare the management theories and models critically and to inspect and question its validity in the real world
		C305.5	To assess and modify different theories of management so as to relate it to current management challenges
		C305.6	To apply principles of management in order to execute the role as a manager
40	ME367 - NON-DESTRUCTIVE TESTING	C306A.1	To introduce the basic principles, techniques, equipment, applications and limitations of NDT
		C306A.2	To study NDT methods such as Visual, Penetrant Testing, Magnetic Particle Testing, Ultrasonic Testing, Radiography, Eddy Current.
		C306A.3	The students will be able to differentiate various defect types and select the appropriate NDT methods for the specimen.
		C306A.4	To enable selection of appropriate NDT methods.
		C306A.5	To identify advantages and limitations of non-destructive testing methods
		C306A.6	To make aware the developments and future trends in NDT
41	ME373 - HUMAN RELATIONS MANAGEMENT	C306B.1	Summarizes human behaviour in individual and group levels.
		C306B.2	Cognize the human relations in organizations and collective bargaining.
		C306B.3	Be able to manage employer-employee relations and conflicts.
		C306B.4	Familiarize the importance of T&D and Performance Management in an organisation
		C306B.5	Analyse the practice of Talent management and Compensation Management
		C306B.6	Apply HRM in maintaining good Employee relations

42	ME341 - DESIGN PROJECT	C307.1	The students will be able to think innovatively on the development of components, products in the engineering field
		C307.2	The students will be able to think innovatively on the development of components, processes or technologies in the engineering field
		C307.3	The students will be able to analyse the problem requirements and arrive workable design solutions
		C307.4	The students will be able to understand the engineering aspects of design with reference to simple products to assess its impact on the society, health, environment and safety
		C307.5	The students will be able to understand the engineering aspects of process or technologies with reference to simple products to assess its impact on the society, health, environment and
		C307.6	The students will be able to develop design that add value to products and solve technical problems
43	EE335 - ELECTRICAL AND ELECTRONICS LAB	C308.1	Students will be able to Perform load test on DC shunt, series motors, single phase transformers, 3/1 phase induction motors and analyse its performance characteristics.
		C308.2	Students will be able to perform the load test on shunt generator and predetermine the performance of DC machine when working as motor/generator
		C308.3	Students can determine the efficiency and voltage regulation of a single-phase transformer performing oc/sc test
		C308.4	Students can determine the open circuit characteristics of self-excited generators
		C308.5	Students will get awareness in applying rectifier circuits and CE configuration of BJT
		C308.6	Acquire knowledge on working of semiconductor devices
44	ME331 - MANUFACTURING TECHNOLOGY LAB I	C309.1	To develop skills in doing literature survey, technical presentation and report preparation.
		C309.2	To enable project identification and execution of preliminary works on final semester project
		C309.3	Conduct experiments to determine thermal conductivity of materials
		C309.4	Determine heat transfer coefficient, LMTD etc..
		C309.5	Do calibration of thermometers and pressure gauges
		C309.6	Demonstrate the effect of unbalance resulting from rotary motions

45	ME302 HEAT & MASS TRANSFER	C310.1	To understand and apply Fourier's law of heat conduction for solving problems involving steady state conduction with and without heat generation in simple geometries
		C310.2	To Evaluate heat transfer coefficient for free and forced convection using empirical correlations
		C310.3	To understand the basic principle of lumped parameter analysis in transient conduction and to solve problems on heat transfer through fins.
		C310.4	To understand the classification and performance of heat exchangers and solve problems of performance analysis of heat exchangers.
		C310.5	To Understand the basic laws of radiation and estimate the radiation heat transfer between black body and grey body surfaces
		C310.6	To Understand the concept of diffusion and convective mass transfer and solve problems involving diffusion and convective mass transfer
46	ME304 DYNAMICS OF MACHINERY	C311.1	Solving problems related to static force analysis of planar mechanism both graphically and analytically.
		C311.2	Students can solve problems related to dynamic analysis and analyse forces involved during the power transmission through spur, helical and worm gears.
		C311.3	Students can explain turning moment diagrams of IC engines, can conduct flywheel analysis and are capable of balancing rotating and reciprocating masses.
		C311.4	Students can explain the theory behind gyroscopic couple and to predict the effect of gyroscopic couple in aircraft, ships and automobiles.
		C311.5	Knowledge in the vibration model of a system, concept of free damped and un damped, forced vibration systems and can solve problem related to different damping conditions.
		C311.6	Students are capable of solving problems related to free torsional vibrations in shafts. They also have knowledge in vibration absorbers, dampers and vibration measuring instruments.
47	ME306 ADVANCED MANUFACTURING TECHNOLOGY	C312.1	To introduce the basic principles, techniques, equipment, applications and limitations of NDT
		C312.2	To study NDT methods such as Visual, Penetrant Testing, Magnetic Particle Testing, Ultrasonic Testing, Radiography, Eddy Current.
		C312.3	The students will be able to differentiate various defect types and select the appropriate NDT methods for the specimen.
		C312.4	To enable selection of appropriate NDT methods.
		C312.5	To identify advantages and limitations of non-destructive testing methods
		C312.6	To make aware the developments and future trends in NDT

48	ME308 COMPUTER AIDED DESIGN AND ANALYSIS	C313.1	Students able to express the concept of CAD/CAM/CIM and Other terminologies used in the development and manufacturing of a product.
		C313.2	Students able to demonstrate different methods for geometric modelling in CAD.
		C313.3	Students able to evaluate the types of curves used in creating a geometry.
		C313.4	Students able to demonstrate different solid modelling representations used in CAD.
		C313.5	Students able to formulate stiffness matrix to analyse structural and thermal problems
		C313.6	Students analyse structural finite element problems by getting knowledge about various finite element methods.
49	ME312 METROLOGY AND INSTRUMENTATION	C314.1	Students will be able Understand the principle of linear and angular measuring instruments and will apply the acquired knowledge for the accurate and precise measurement of a given quantity.
		C314.2	Will demonstrate the ability to apply the principle of limits, fits and tolerance while designing and manufacturing the components of their requirement.
		C314.3	Understand fundamentals of various methods for the measurements of screw threads, surface roughness parameters and working of optical measuring instruments and able to apply them in their engineering projects.
		C314.4	Will become familiarized with various advanced measuring devices and machine tool metrology.
		C314.5	Will be able to use various devices for measuring torque, force, strain, stress and temperature.
		C314.6	Demonstrate the ability to analyse the results of various measuring systems and instruments for motion and dimensional measurements and can infer the results to give better conclusions.
50	ME368 MARKETING MANAGEMENT	C315A.1	Identify key marketing concepts, theories and techniques for analysing a variety of marketing situations
		C315A.2	Identify and demonstrate the dynamic nature of the environment in which marketing decisions are taken and appreciate the implications of marketing strategy determination and implementation.
		C315A.3	Apply the introduced conceptual frameworks, theory and techniques to various marketing contexts
		C315A.4	Work in a manner consistent with law, professional standards and protocols as related to marketing, advertising, promotion and ethical considerations
		C315A.5	Identify and integrate appropriate technologies in developing solutions to business opportunities and challenges
		C315A.6	Reiterate the laws of management in Strategic issues for competitiveness in marketing
51	ME376 MAINTENANCE ENGINEERING	C315B.1	To give an idea about global energy scenario and conventional energy sources
		C315B.2	To understand solar, wind and Biomass energy
		C315B.3	To know concepts of other renewable energy sources
		C315B.4	To create awareness on the impacts of energy conversion and importance of sustainable energy
		C315B.5	Understand energy scenario and the environmental effects of energy conversion.
		C315B.6	Become aware of different renewable energy sources and choose sustainable energy

52	ME332 COMPUTER AIDED DESIGN AND ANALYSIS LAB	C316.1	Students are capable of developing 3d models of machine components, complex geometries etc. Using CATIA V6
		C316.2	Students are capable to assembly the parts created to develop the whole mechanism.
		C316.3	Students are capable to generate 2D sketches of the assembled parts and provide dimensions and symbols to generate 2D drawing.
		C316.4	Students can apply their knowledge in importing CAD geometries and to modify and mesh using different meshing methods and local meshing controls as a part of pre-processing of the FE problem in ANSYS workbench
		C316.5	Students have knowledge to conduct simple structural, fluid flow and thermal analysis problems in ANSYS.
53	ME334 MANUFACTURING TECHNOLOGY LAB II	C317.1	Students will be able to select and use different linear and angle measuring devices like vernier callipers, micrometres, bevel protractors, slip gauges etc.
		C317.2	Students will be able to use equipment like Surface Roughness tester, Profile projector, and Tool makers Microscope to find out parameters of gear, thread, tool and surface roughness
		C317.3	Students will be able to do the process of calibration by carrying out experiments on devices like strain gauge, LVDT, and Roughness tester.
		C317.4	Students will be able to understand about CNC machine tool and also to write NC part programming statements to carry out the machining processes using CNC machine tool.
		C317.5	Students will be able to make inferences during different measurement processes
		C317.6	Students will be able to perform, analyse and infer the experiments as a team.
54	ME352 COMPREHENSIVE EXAM	C318.1	The students will be confident in discussing the fundamental aspects of any engineering problem/situation and give answers in dealing with them
		C318.2	Learn to prepare for a competitive examination
		C318.3	Comprehend the questions in Mechanical Engineering field and answer them with confidence
		C318.4	Comprehend the questions related to basic mathematics courses and answer them with confidence
		C318.5	Communicate effectively with faculty in scholarly environments
		C318.6	Analyse the comprehensive knowledge gained in basic courses in the field of Mechanical Engineering

55	ME401 DESIGN OF MACHINE ELEMENTS I	C401.1	Students will able to understand and identify the different procedures to be followed during different phases of design process and understand the basic material properties.
		C401.2	Students will understand different failure theories and basic concepts of deign factors like stress, factor of safety, etc
		C401.3	Students will understand the basics of threaded and bolted joints. They will identify the forces acting on the joint and calculate the maximum stress in the system. They will be able to compare and evaluate the permissible stress on a material and select the material for required force. With the optimum constrains students are able to design threaded and bolts
		C401.4	Students will understand the basics and applications of riveted, cotter, knuckle, gib and welded joints. They will be able to calculate and analyse the load on the system. According to the application, student will be able to choose the type of joint and design the system to satisfy the requirement.
		C401.5	Students will be able to classify different type of springs. They will be able to predict different effects on the spring under different loading conditions. According to application they will be able to calculate the load and analyse the deformation of the spring. By evaluating the load carrying capacity, the student can design the spring to the required system.
		C401.6	Students will be able to explain the different design consideration while designing shaft and couplings. They will be able to calculate the forces acting on the system. Students will be able to analyse and choose suitable design parameters for the system. They will be able to design couplings (shaft, keys, pins etc.) For the specified requirement.
56	ME403 ADVANCED ENERGY ENGINEERING	C402.1	To give an idea about global energy scenario and conventional energy sources
		C402.2	To understand solar, wind and Biomass energy
		C402.3	To know concepts of other renewable energy sources
		C402.4	To create awareness on the impacts of energy conversion and importance of sustainable energy
		C402.5	Understand energy scenario and the environmental effects of energy conversion.
		C402.6	Become aware of different renewable energy sources and choose sustainable energy
57	ME405 REFRIGERATION AND AIR CONDITIONING	C403.1	Understand the principles refrigeration of air-conditioning and basic design considerations
		C403.2	Carry out analysis of refrigeration cycles
		C403.3	Study the types of refrigerants and its environmental effects.
		C403.4	Apply the concepts of indoor environmental comfort.
		C403.5	Perform psychrometric calculations, humidity control and analysis of air-conditioning processes
		C403.6	Know the various applications of Refrigeration and air conditioning

58	ME407 MECHATRONICS	C404.1	Students will able to understand and identify the different procedures to be followed during different phases of design process and understand the basic material properties.
		C404.2	Students will understand different failure theories and basic concepts of deign factors like stress, factor of safety, etc.
		C404.3	Students will understand the basics of threaded and bolted joints. They will identify the forces acting on the joint and calculate the maximum stress in the system. They will be able to compare and evaluate the permissible stress on a material and select the material for required force. With the optimum constrains students are able to design threaded and bolts.
		C404.4	Students will understand the basics and applications of riveted, cotter, knuckle, gib and welded joints. They will be able to calculate and analyse the load on the system. According to the application, student will be able to choose the type of joint and design the system to satisfy the requirement.
		C404.5	Students will be able to classify different type of springs. They will be able to predict different effects on the spring under different loading conditions. According to application they will be able to calculate the load and analyse the deformation of the spring. By evaluating the load carrying capacity, the student can design the spring to the required system
		C404.6	Students will be able to explain the different design consideration while designing shaft and couplings. They will be able to calculate the forces acting on the system. Students will be able to analyse and choose suitable design parameters for the system. They will be able to design couplings (shaft, keys, pins etc.) For the specified requirement
59	ME409 COMPRESSIBLE FLUID FLOW	C405.1	To understand and apply the conservation of mass, momentum and energy to a control volume and to solve compressible flow related engineering problems by evaluating acoustic speed and Mach number.
		C405.2	To apply the knowledge gained in performing preliminary design of supersonic inlets, diffusers and other compressible flow devices by using one dimensional isentropic compressible flow theory.
		C405.3	To apply the principles of mass, momentum and energy balance with gas equations of state to analyse normal shock
		C405.4	To apply the principles of mass, momentum and energy balance with gas equations of state to analyse Fanno flow
		C405.5	To apply the principles of mass, momentum and energy balance with gas equations of state to analyse Rayleigh flow.
		C405.6	To understand various compressible flow field visualization and measurement methods.

60	ME463 AUTOMOBILE ENGINEERING	C406A.1	Students will be able to practically identify and explain different automotive systems and subsystems
		C406A.2	Students will be able to understand the principles of transmission, suspension, steering and braking systems of an automobile
		C406A.3	Students will be able to investigate the future developments in the automobile industry
		C406A.4	Students will be able to interpret the various terminologies used in the automotive industry
		C406A.5	Students will be able to analyse the effectiveness of energy storing and dissipating systems in a vehicle.
		C406A.6	Students will be able to evaluate the aerodynamic design parameters of the vehicle and can validate the same
61	ME467 CRYOGENIC ENGINEERING	C406B.1	To introduce the basic principles, techniques, equipment, applications and limitations of NDT
		C406B.2	To study NDT methods such as Visual, Penetrant Testing, Magnetic Particle Testing, Ultrasonic Testing, Radiography, Eddy Current.
		C406B.3	The students will be able to differentiate various defect types and select the appropriate NDT methods for the specimen.
		C406B.4	To enable selection of appropriate NDT methods.
		C406B.5	To identify advantages and limitations of non-destructive testing methods
		C406B.6	To make aware the developments and future trends in NDT
62	ME451 SEMINAR & PROJECT PRELIMINARY	C407.1	To develop skills in doing literature survey, technical presentation and report preparation.
		C407.2	To enable project identification and execution of preliminary works on final semester project
		C407.3	Conduct experiments to determine thermal conductivity of materials
		C407.4	Determine heat transfer coefficient, LMTD etc..
		C407.5	Do calibration of thermometers and pressure gauges
		C407.6	Demonstrate the effect of unbalance resulting from rotary motions
63	ME431 MECHANICAL ENGINEERING LAB	C408.1	Visualise the effect of dynamics on vibrations in single and multi-degree of freedom system
		C408.2	Demonstrate the working principle of governor /gyroscope and demonstrate the effect of forces and moments on their motion
		C408.3	To acquire knowledge and design of different types of clutches and brakes
		C408.4	To understand the basics of bearings, types of bearing, lubrication system and design of bearings.
		C408.5	To understand the concept of gears and the basic procedure in design of spur gear.
		C408.6	To understand the basic procedure in design of Helical gear, Bevel gear, worm and worm wheel.

64	ME402 DESIGN OF MACHINE ELEMENTS II	C409.1	To acquire knowledge and design of flat belt, v belt and chains.
		C409.2	To acquire basic knowledge in Connecting rod and Pressure vessels.
		C409.3	To impart theoretical knowledge about various tools and techniques of Industrial Engineering
		C409.4	To get acquainted with the Inventory management Principles and Techniques.
		C409.5	To create awareness about various safety procedures to be followed in carrying out different types of projects
		C409.6	To equip with the theoretical knowledge on Quality control practices and testing methods.
65	ME404 INDUSTRIAL ENGINEERING	C410.1	Know various tools and techniques in industrial Engineering.
		C410.2	Develop work procedure applying the principles of work study
		C410.3	Formulate replacement and purchase decisions and arrive at conclusions
		C410.4	Develop a systematic plant layout
		C410.5	Analyse the safety and environmental aspects in facilities planning
		C410.6	Understand various material handling systems and classification of material handling equipment
66	ME476 MATERIAL HANDLING & FACILITIES PLANNING	C411A.1	Selection and Maintenance of material handling equipment with safety and ergonomics aspects
		C411A.2	Understand various miscellaneous material handling systems and classifications.
		C411A.3	Will understand the fundamentals of various methods for the measurements of screw threads, surface roughness parameters and the working of optical measuring instruments and will be able to apply them in their engineering projects.
		C411A.4	Will become familiarized with various advanced measuring devices and machine tool metrology.
		C411A.5	Will be able to use various devices for measuring torque, force, strain, stress and temperature.
		C411A.6	Demonstrate the ability to analyse the results of various measuring systems and instruments for motion and dimensional measurements and can infer the results to give better conclusions.
67	CE488 DISASTER MANAGEMENT	C412A.1	Able to explain disaster management theory (cycle, phases, risk, crisis, emergency, disasters, resilience)
		C412A.2	To compare hazards, disasters and associated natural phenomena and their interrelationships, causes and their effects - developing humanitarian Assistance before and after disaster
		C412A.3	To compare anthropogenic hazards, disasters and associated activities and their interrelationships of the subsystems - Green House Effect, Global warming, Causes and their effects and development of humanitarian assistance before and after disaster
		C412A.4	To apply knowledge about existing global frameworks and existing agreements and role of community in successful Disaster Risk Reduction
		C412A.5	To evaluate DM study including data search, analysis and presentation as a case study.
		C412A.6	To create Technological innovations in Disaster Risk Reduction: Advantages and problems

68	ME492 PROJECT	C413.1	To give a platform for the students to apply the theoretical knowledge they gained during the course and conduct analysis and create working models.
		C413.2	To enable the students to use different design platforms for design and analysis of project.
		C413.3	To give a chance to improve communication skills and enable the students to express the theoretical knowledge to defend
		C413.4	To impart theoretical knowledge about wind tunnels and experimental fluid mechanics.
		C413.5	To give the students a feel of working in a team environment and contribute to the success of the project.