



Department of Civil Engineering

MANGALAM COLLEGE OF ENGINEERING

COURSE OUTCOMES OF ALL COURSES (2019 SCHEME)

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Course Name: EST 100 Engineering Mechanics

Regulation: 2019 Scheme

COURSE OUTCOMES

COs	Description	Taxonomy
EST100.1	Explain principles and theorems related to rigid body mechanics	Understand
EST100.2	Describe the components of system of forces acting on the rigid body	Understand
EST100.3	Apply the conditions of equilibrium to various practical problems involving different force system.	Apply
EST100.4	Choose appropriate theorems, principles or formulae to solve problems of mechanics.	Apply
EST100.5	Brief about dynamics and mechanical vibrations, solve simple numerical related to it	Apply

Course Name: ESL120 Basics of Civil and Mechanical Engineering workshop

Regulation: 2019 Scheme

COURSE OUTCOMES

COs	Description	Taxonomy
ESL120.1	Name and explain the use of various tools and devices for various civil engineering field measurements	Remember
ESL120.2	Demonstrate the steps involved in basic civil engineering activities like plot measurement, setting out operation, evaluating the natural profile of land, plumbing and undertaking simple construction work	Apply
ESL120.3	Choose materials and methods required for basic civil engineering activities like field measurements, masonry work and plumbing..	Apply
ESL120.4	Identify Basic Mechanical workshop operations in accordance with the material and objects	Apply
ESL120.5	Apply appropriate Tools and Instruments with respect to the mechanical workshop trades	Apply
ESL120.6	Apply appropriate safety measures with respect to the mechanical workshop trades	Apply



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Course Name: EST120 Basics of Civil Engineering	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
EST120.1	Recall the role of civil engineer in society to relate the various disciplines of Civil Engineering and types of buildings, area, and its functions, rules and regulations.	Remember
EST120.2	Describe the importance, objectives and principles of surveying and to explain different types of building materials used for construction	understand
EST120.3	Describe about the building construction, and summarize about the basic infrastructure services and green buildings.	Remember



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Course Name: CET 201 MECHANICS OF SOLIDS	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET201.1	Recall the fundamental terms and theorems associated with mechanics of linear elastic deformable bodies.	Remember
CET201.2	Apply the principles of solid mechanics to calculate internal stresses/strains, stress resultants and strain energies in structural elements subjected to different loading conditions.	Apply
CET201.3	Calculate and draw bending moment and shear force in a loaded beam and to find the point of contraflexure	Apply
CET201.4	Learn the theory of simple bending and to calculate the various parameters associated with bending	Apply
CET201.5	Locate Principal Planes and calculate Principal Stresses for 2D problems, Explain the concept of column buckling and torsion and strain energy in circular and hollow circular shafts.	Apply

Course Name: CET 203 FLUID MECHANICS AND HYDRAULICS	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET203.1	Recall the relevant principles of hydrostatics and hydraulics of pipes and open channels	Understand
CET203.2	Describe about buoyancy and flotation and hydrodynamics of fluid motion in 1, 2 and 3 Dimensions	Apply
CET203.3	Apply Bernoulli's equation to fluid flow problems involving venturimeter, orifice meter, pitot tube, orifices, mouthpieces and analyze the flow through pipes and the major and minor energy losses	Apply
CET203.4	Compute flow in open channels and discharges in notches and weirs	Apply
CET203.5	Compute Specific energy and describe about gradually and rapidly varied flow with its applications.	Apply



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Course Name: CET 205 Surveying & Geomatics	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET205.1	Describe about surveying, levelling, various instrument used for it and brief about contouring.	Understand
CET205.2	Apply surveying techniques for computation of area-volume and sketching mass diagram detail about theodolite survey triangulation techniques	Apply
CET205.3	Apply different methods of traverse surveying and traverse balancing, theory and computation of errors	Apply
CET205.4	Apply the basic knowledge of setting out of different types of curves	Understand
CET205.5	Employ surveying techniques using advanced surveying equipments	Understand

Course Name: CEL201 Civil Engineering Planning & Drafting Lab	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CEL201.1	Draw, prepare and interpret the various building components and familiarize with Kerala building Rules	Apply
CEL201.2	Draw the partial elevations of the Steel truss, the connections involved in it and design of Reinforced concrete staircase.	Apply
CEL201.3	Develop the plan, section and elevation of single-storied and double storied buildings from given line sketches	Apply
CEL201.4	Plan and develop a line sketches and working drawings of single-storied RCC residential buildings as per functional requirements	Apply
CEL201.5	Develop site plan of a given building using Kerala Building Rules	Apply
CEL201.6	Prepare plan, elevation, and section of a building using Auto CADD software	Apply



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Course Name: CEL 203 Surveying Lab	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CEL203.1	Use conventional surveying tools such as chain/tape and compass for plotting and area determination	Apply
CEL203.2	Apply levelling principles in field	Apply
CEL203.3	Solve triangulation problems using theodolite	Apply
CEL203.4	Employ total station for field surveying	Apply
CEL203.5	Demonstrate the use of distomat and handheld GPS	Apply

Course Name: MCN 202 SUSTAINABLE ENGINEERING	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
MCN 201.1	Understand the relevance and the concept of sustainability and the global initiatives in this direction	Understand
MCN 201.2	Explain the different types of environmental pollution problems and their sustainable solutions	Understand
MCN 201.3	Discuss the environmental regulations and standards	Remember
MCN 201.4	Outline the concepts related to conventional and non-conventional energy	Remember
MCN 201.5	Demonstrate the broad perspective of sustainable practices by utilizing engineering knowledge and principles	Understand



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Course Name: CET 202 Engineering Geology	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET202 .1	Recall the fundamental concepts of surface processes, subsurface process, minerals, rocks, groundwater and geological factors in civil engineering constructions.	Understand
CET202 .2	Identify and describe the surface processes, subsurface process, earth materials, groundwater and geological factors in civil engineering constructions.	Understand
CET202 .3	Apply the basic concepts of surface and subsurface processes, minerals, rocks, groundwater and geological characteristics in civil engineering constructions.	Apply
CET202 .4	Analyze and classify geological processes and earth materials.	Understand
CET202 .5	Evaluation of geological factors in civil engineering constructions.	Understand

Course Name: CET206Transportation Engineering	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET206 .1	Apply the basic principles of Highway planning and design highway geometric elements	Apply
CET206 .2	Apply standard code specifications in judging the quality of highway materials; designing of flexible pavements	Apply
CET206 .3	Explain phenomena in road traffic by collection, analysis and interpretation of traffic data through surveys; creative design of traffic control facilities	Apply
CET206.4	Understand about railway systems, tunnel, harbour and docks	Remember
CET206 .5	Express basics of airport engineering and design airport elements	Apply


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Course Name: CET204 Geotechnical Engineering I	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET204.1	Estimate basic soil properties using three phase system	Apply
CET204.2	Calculate the engineering properties of soil by applying the laboratory test results and the fundamental concepts of soil mechanics	Apply
CET204.3	Study the principle of effective stress, various methods to find stress distribution and apply the same in solving numericals.	Apply
CET204.4	Explain the difference between compaction and consolidation in detail about the laboratory tests to solve numericals associated with it	Apply
CET204.5	Explain the practical applications of shear strength of soil, its laboratory tests, stability of slopes and solving the numerical problems associated with it.	Analyse

Course Name: CEL202 Material testing Lab I	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CEL202.1	Conduct tension test on steel, aluminium, copper and brass	Apply
CEL202.2	Conduct compression tests on spring, wood and concrete	Apply
CEL202.3	Conduct flexural and torsion test to determine elastic constants	Apply
CEL202.4	Determine hardness of metals	Apply

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Course Name: HUT200 Professional Ethics	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
HUT200.1	Understand the core values that shape the ethical behaviour of a professional.	Understand
HUT200.2	Adopt a good character and follow an ethical life.	Understand
HUT200.3	Explain the role and responsibility in technological development by keeping personal ethics and legal ethics.	Explain
HUT200.4	Solve moral and ethical problems through exploration and assessment by established experiments.	Apply
HUT200.5	Apply the knowledge of human values and social values to contemporary ethical values and global issues.	Apply

Course Name: EST200 DESIGN AND ENGINEERING	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
EST200.1	Explain the different concepts and principles involved in design engineering	Explain
EST200.2	Apply design thinking while learning and practicing engineering.	Apply
EST200.3	Explain different aspects of design communication, modeling, prototyping and proofing.	Explain
EST200.4	Apply design engineering concepts based on Learning and Problem-based Learning.	Apply
EST200.5	Develop innovative, reliable, sustainable and economically viable designs incorporating knowledge in engineering.	Apply



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Course Name: MCN202 Constitution of India	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
MCN202.1	Explain the background of the present constitution of India and features.	Explain
MCN202.2	Utilize the fundamental rights and duties.	Understand
MCN202.3	Understand the working of the union executive, parliament and judiciary.	Understand
MCN202.4	Understand the working of the state executive, legislature and judiciary.	Understand
MCN202.5	Utilize the special provisions, statutory institutions and the federal system.	Understand



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Course Name: CET 301 STRUCTURAL ANALYSIS - I	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET301.1	Apply the principles of solid mechanics to analyse trusses and various methods to determine deflections in statically determinate structures	Apply
CET301.2	Identify the problems with static indeterminacy and tackle such problems by means of the method of consistent deformations and energy principles.	Apply
CET301.3	Apply specific methods such as slope deflection and moment distribution methods of structural analysis for typical structures with different characteristics.	Apply
CET301.4	Apply suitable methods of analysis for various types of structures including cables and suspension bridges.	Apply
CET301.5	Analyse the effects of moving loads on structures using influence lines.	Analyse

Course Name: CET 303 DESIGN OF CONCRETE STRUCTURES	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET303.1	Understand the fundamental concepts of limit state design and code provisions for design of concrete members under bending, shear, compression and torsion.	Understand
CET303.2	Analyse reinforced concrete sections to determine the ultimate capacity of beams in bending, shear and compression.	Analyse
CET303.3	Design and detail slab and stair case using IS code provisions.	Apply
CET303.4	Design and detail columns using IS code and SP 16 design charts.	Apply
CET303.5	Design and detail of footings and explain the criteria for earthquake resistant design of structures.	Apply



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Course Name: CET 305 GEOTECHNICAL ENGINEERING – II

Regulation: 2019 Scheme

COURSE OUTCOMES

COs	Description	Taxonomy
CET305.1	Analyse the earth pressure, attain the knowledge of various theories and understand the basics of foundation	Analyse
CET305.2	Understand the bearing capacity of shallow foundations and the factors affecting bearing capacity	Understand
CET305.3	Analyse the causes of different settlements and understand the basic concept of footing and raft foundation	Analyse
CET305.4	Differentiate the characteristics of pile and well foundation	Understand
CET305.5	Understand the site investigating methodologies and soil exploration techniques	Understand

Course Name: CET 307 HYDROLOGY & WATER RESOURCES ENGINEERING

Regulation: 2019 Scheme

COURSE OUTCOMES

COs	Description	Taxonomy
CET307.1	Understand the hydrologic cycle and the mechanism of precipitation along with the measurement of precipitation, infiltration and evaporation.	Understand
CET307.2	Compute the amount of run-off after precipitation using hydrograph analysis	Apply
CET307.3	Understand the types, methods and benefits of irrigation and they will be able to compute the water requirements of crops along with various deficiencies	Understand
CET307.4	Describe and apply the principles of reservoir engineering to estimate the capacity of reservoirs and their useful life.	Apply
CET307.5	Demonstrate the principles of groundwater engineering and apply them	Apply



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Course Name: CET 309 CONSTRUCTION TECHNOLOGY AND MANAGEMENT	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET309.1	Describe the properties of materials used in construction	Understand
CET309.2	Determine the properties of concrete and understand the various elements of building construction	Understand
CET309.3	Demonstrate the technologies of various construction processes	Apply
CET309.4	Understand about contents of project report, tenders and contracts.	Understand
CET309.5	Apply scheduling techniques in project planning and control	Apply

Course Name: MCN 301 DISASTER MANAGEMENT	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
MCN301.1	Define and use various terminologies used in disaster management parlance and organise each of these terms in relation to the disaster management cycle	Remember
MCN301.2	Distinguish between different hazard types and vulnerability types and do vulnerability assessment	Understand
MCN301.3	Identify the components and describe the process of risk assessment, and apply appropriate methodologies to assess risk and response for it	Apply
MCN301.4	Discuss about the stakeholder's role, communication and capacity related issues	Understand
MCN301.5	Explain the various legislations and best practices for disaster management and risk reduction at national and international level	Understand



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Course Name: CEL 331 MATERIAL TESTING LAB II	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CEL331.1	Determine the different physical properties of various construction materials such as cement, sand and coarse aggregate and compare the values with IS values	Apply
CEL331.2	Develop the concrete mix proportioning for various grades of concrete	Apply
CEL331.3	Determine the various fresh and hardened properties of concrete	Apply
CEL331.4	Determine the properties of various construction materials such as bricks, floor and roof tiles as per IS codal provisions	Apply
CEL331.5	Analyse the hardened properties of concrete by using non-destructive tests.	Apply

Course Name: CEL 333 GEOTECHNICAL ENGINEERING LAB	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CEL333.1	Identify and classify soil based on standard geotechnical experimental methods.	Apply
CEL333.2	Estimate the physical and index properties of soil using various tests	Apply
CEL333.3	Perform and analyze permeability tests.	Apply
CEL333.4	Interpret engineering behavior of soils based on test viz. compaction, CBR and in-place density test for fill quality control in the field.	Apply
CEL333.5	Evaluate the strength of soil by performing various tests viz. direct shear test, unconfined compressive strength test and triaxial shear test.	Apply



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Course Name: CET 302 Structural Analysis II	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET302.1	Understand the principles and applications of plastic theory and analysis for framed structures subjected to vertical loads.	Understand
CET302.2	Analyse structures by force method and frames subjected to wind load by approximate methods and flexibility method	Analyse
CET302.3	Apply stiffness method to analyse structures	Apply
CET302.4	Apply direct stiffness method to analyse structures.	Apply
CET302.5	Remember basic dynamics, understand the basic principles of structural dynamics and apply the same to simple structures.	Remember

Course Name: CET 304 Environmental Engineering	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET304.1	Design population, Water demand estimation and planning for collection and conveyance of water and wastewater.	Analyse
CET304.2	Study of Unit Processes and design of sedimentation unit.	Understand
CET304.3	Planning and design of filtration unit and design of water distribution network.	Create
CET304.4	Study of primary, secondary and tertiary treatment systems and design of activated sludge plant.	Understand
CET304.5	Design of septic tank and study of natural water treatment systems.	Analyse


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Course Name: CET 306 Design of Hydraulic Structures	Regulation: 2019 Scheme
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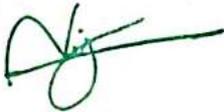
COURSE OUTCOMES

COs	Description	Taxonomy
CET306.1	Elucidate about the different components of hydraulic structures and its functions with Bligh's and Khosla's theory	Understand
CET306.2	Describe the features of canal structures and perform the design of alluvial canals	Understand
CET306.3	Prepare the scaled drawings of different minor irrigation structures	Apply
CET306.4	Describe the design principles and features of dams and perform the stability analysis of gravity dams	Apply
CET306.5	Describe the design principles and failures of Earth, Arch Dams and IS I and II spillway types.	Apply

Course Name: HUT 300 Industrial Economics & Foreign Trade	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
HUT300.1	Explain the problem of scarcity of resources and consumer behaviour, and to evaluate the impact of government policies on the general economic welfare.	Understand
HUT300.2	Take appropriate decisions regarding volume of output and to evaluate the social cost of production.	Apply
HUT300.3	Determine the functional requirement of a firm under various competitive conditions.	Apply
HUT300.4	Examine the overall performance of the economy, and the regulation of economic fluctuations and its impact on various sections in the society.	Analyse
HUT300.5	Determine the impact of changes in global economic policies on the business opportunities of a firm.	Apply


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Course Name: CET 352 Advanced Concrete Technology	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET352.1	Understand the properties and testing of concrete materials and different types of admixtures	Understand
CET352.2	Design concrete mix using IS code	Apply
CET352.3	Describe the procedure of determining the properties of fresh and hardened concrete	Understand
CET352.4	Understand the durability properties and non destructive testing of concrete.	Understand
CET352.5	Describe the various special types of concrete.	Understand

Course Name: CET 362 ENVIRONMENTAL IMPACT ASSESSMENT	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET362.1	Understand the EIA acts and the need for minimizing the environmental impacts of developmental activities	Understand
CET362.2	Understand environmental legislation & clearance procedure in the country	Understand
CET362.3	Apply various methodologies for assessing the environmental impacts of any developmental activity	Apply
CET362.4	Prepare an environmental impact assessment report	Apply
CET362.5	Understand the case studies related to EIA	Understand

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Course Name: CET 332 TRAFFIC ENGINEERING AND MANAGEMENT	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET332.1	Identify the relationship among various traffic stream variables	Apply
CET332.2	Apply traffic management measures and regulations so as to solve issues related to traffic flow in road network.	Apply
CET332.3	Explain the concept of capacity and LOS and its estimation for various traffic facilities	Understand
CET332.4	Identify the need for intersection control and design of various types	Apply
CET332.5	Analyse causes of road accidents and suggest preventive measures	Analyse

Course Name: CEL 332 Transportation Engineering Lab	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CEL332.1	Analyse the suitability of soil as a pavement subgrade material	Apply
CEL332.2	Assess the suitability of aggregates as a pavement construction material	Apply
CEL332.3	Characterize bitumen based on its properties so as to recommend it as a pavement construction material.	Apply
CEL332.4	Design bituminous mixes for pavement layers	Apply
CEL332.5	Assess functional adequacy of pavements based on roughness of pavement surface.	Apply



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Course Name: CEL 334 CIVIL ENGINEERING SOFTWARE LAB	Regulation: 2019 Scheme
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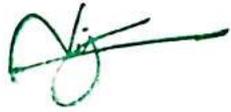
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COs	Description	Taxonomy
CEL334.1	Analysis and design of steel and RCC elements using any standard software used in the industry.	Apply
CEL334.2	Preparation of structural drawings of slabs, beams and foundation units	Apply
CEL334.3	Study of Building Information Modelling tools	Apply
CEL334.4	Use of Project Management Software (MS Project/Primavera)	Apply
CEL334.5	Field exercise to use Total Station	Apply

Course Name: CET 308 COMPREHENSIVE COURSE WORK	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET308.1	Recall the fundamental concepts of mechanics of solids	Remember
CET308.2	Recall the fundamentals of fluid mechanics	Remember
CET308.3	Recall the fundamental concepts of surveying and geomatics	Remember
CET308.4	Recall the fundamental concepts of geotechnical engineering	Remember
CET308.5	Recall the fundamental concepts of construction and concrete technology	Remember


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Course Name: CET 401 Design of Steel Structures	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET401.1	Design bolted and welded connections	Apply
CET401.2	Design tension members and beams using the IS specifications	Apply
CET401.3	Design columns under axial loads using IS specifications	Apply
CET401.4	Design beams and plate girders	Apply
CET401.5	Assess loads on a truss and design purlins	Apply

Course Name: CEL 411 Environmental Engineering Lab	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CEL411.1	Develop a working knowledge about the laboratory analysis used for the determination of physical, chemical and biological properties of water and waste water.	Analyse
CEL411.2	Evaluate the analysis results and classify water and wastewater as per IS specifications.	Apply
CEL411.3	Assess the quality of water and wastewater for various practical purposes.	Apply

Course Name: CEQ413 Seminar	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CEQ413.1	Identify academic documents from the literature which are related to her/his areas of interest	Create
CEQ413.2	Read and apprehend an academic document from the literature which is related to her/ his areas of interest	Create
CEQ413.3	Prepare a presentation about an academic document.	Create
CEQ413.4	Give a presentation about an academic document	Create
CEQ413.5	Prepare a technical report	Create


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Course Name: CED 415 Project Phase I	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CED415.1	Model and solve real world problems by applying knowledge across domains	Create
CED415.2	Develop products, processes or technologies for sustainable and socially relevant applications	Create
CED415.3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks	Create
CED415.4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms	Create
CED415.5	Identify technology/research gaps and propose innovative/creative solutions	Create

Course Name: CET 423 GROUND IMPROVEMENT TECHNIQUES	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET423.1	Classify different ground improvement methods based on soil suitability	Understand
CET423.2	Outline the basic concept / design aspects of various ground improvement methods	Understand
CET423.3	Identify the construction procedure of different ground improvement methods	Apply
CET423.4	Identify the suitability of earth reinforcement ,soil nailing and application of geosynthetics.	Apply
CET423.5	Choose different application for grouting and thermal soil stabilization.	Apply



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Course Name: CET 413 Prestressed Concrete	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET413.1	Develop a working knowledge of essential concepts in prestressed concrete	Apply
CET413.2	Analyse a prestressed member section	Analyse
CET413.3	Estimate losses of prestressing	Understand
CET413.4	Design a prestressed member in accordance with standard procedures	Apply
CET413.5	Evaluate the behaviour and design of end blocks and composite members and their applications	Apply

Course Name: CET445 NATURAL DISASTERS AND MITIGATION	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET445.1	Explain interaction between subsystems of earth that give rise to hazards and their potential for disasters	Understand
CET445.2	Explain the evolving concepts and thoughts of management of hazards and disasters	Understand
CET445.3	Analyse the causes behind natural disasters and evaluate their magnitude and impacts	Analyse
CET445.4	Create management plans for hazards and disasters, and understand the roles of agencies involved.	Apply
CET445.5	Explain the concept of sustainable development and EIA and their role in mitigating disasters	Understand

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Course Name: CET 402 QUANTITY SURVEY AND VALUATION	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET402.1	Understand about the basic principle of quantity surveying, estimate, items of works and rules and method of measurement as per IS 1200 specifications.	Understand
CET402.2	Understand about the schedule of rates, detailed specification as per CPWD and analysis of rate according to DSR and DAR.	Understand
CET402.3	Estimate the detailed quantity of materials for RCC building works, road works, sanitary and water supply works.	Apply
CET402.4	Assess the value of the property and understand the facts about valuation and its methods.	Apply

Course Name: CET424 GEO ENVIRONMENTAL ENGINEERING	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET424.1	Recognize the geo-environmental problems created by waste and its necessity of disposal.	Apply
CET424.2	Understand about the contaminants and its impacts on the environment	Understand
CET424.3	Understand the use of landfill and geo membranes.	Understand
CET424.4	Know about the leachate collection, drainage collection, barrier layer assessment and their design consideration.	Understand
CET424.5	Describe the concept of soil remediation. And stability of landfill.	Understand

Course Name: MCN 401 INDUSTRIAL SAFETY ENGINEERING	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
MCN401.1	Describe the theories of accident causation and preventive measures of industrial accidents	Understand
MCN401.2	Explain about personal protective equipment, its selection, safety performance & indicators and importance of housekeeping	Understand
MCN401.3	Explain different issues in construction industries.	Understand
MCN401.4	Describe various hazards associated with different machines and mechanical material handling.	Understand
MCN401.5	Utilise different hazard identification tools in different industries with the knowledge of different types of chemical hazards.	Apply


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Course Name: CET414Advanced Structural Design	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET414.1	Design the retaining structures	Apply
CET414.2	Design the water tanks as per IS 3370-2009	Apply
CET414.3	Design slabs and flat slabs using yield line theory	Apply
CET414.4	Design compression and tension steel members as per IS codes	Apply
CET414.5	Design continuous beams and portal frames	Apply

Course Name: CET454Construction methods and Equipments	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET454.1	Explain the various construction procedures for sub structures and super structures	Understand
CET454.2	Describe the various construction activities involved in underground and under water construction	Understand
CET454.3	Demonstrate basic knowledge about construction equipment and machineries	Understand
CET454.4	Explain the equipment used for production of aggregates and concreting	Understand
CET454.5	Select construction equipment appropriate to tasks.	Apply



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Course Name: CET416Bridge Engineering	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET416.1	Prepare General Arrangement Design of bridges.	Apply
CET416.2	Explain various loads on bridge and methods of structural analysis of bridges.	Understand
CET416.3	Design culverts and common bridge superstructures such as RCC Solid slab and T-beam & slab and its reinforcement detailing.	Apply
CET416.4	Design composite superstructure such as PSC I girders and steel plate girders with RCC deck slab.	Apply
CET416.5	Identify various bearings and design of bridge substructures and foundation.	Apply

CourseName:CET456REPAIR AND REHABILITATION OF BUILDINGS	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET456.1	Recall the basics ideas and theories associated with Concrete technology and Masonry structures.	Remember
CET456.2	Understand the need and methodology of repair and rehabilitation of structures, the various mechanisms used, and tools for diagnosis of structures	Understand
CET456.3	Identifying the criteria for repairing / maintenance and the types and properties of repair materials used in site. Learn various techniques for repairing damaged and corroded structures	Apply
CET456.4	Proposing wholesome solutions for maintenance/rehabilitation and applying methodologies for repairing structures or demolishing structures.	Apply
CET456.5	Analyse and assess the damage to structures using various tests	Analyse



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CourseName: CET476 BUILDING SERVICES	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET476.1	Recommend appropriate water management services	Evaluate
CET476.2	Develop a system for the management of waste	Apply
CET476.3	Identify suitable electrical and mechanical building services	Apply
CET476.4	Recall the various firefighting services and Choose relevant materials and practices for good acoustics	Remember
CET476.5	Propose sustainable construction materials, methods, and practices	Create

CourseName: CET418 EARTHQUAKE RESISTANT DESIGN	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET418.1	Formulate appropriate SDOF models of simple structural systems under dynamic loads apply them to the solution of engineering problems.	Create
CET418.2	Analyze and interpret the dynamic response of SDOF systems for various dynamic inputs.	Analyse
CET418.3	Develop appropriate mathematical models for 2 DOF systems MDOF shear building models and estimate the natural frequencies and vibration modes for the same.	Apply
CET418.4	Explain the basics of engineering seismology, ground motion characteristics, behavior of structures to ground motion and appreciate the various principles of seismic design philosophy	Understand
CET418.5	Apply the provisions of various Indian seismic design standards for the estimation of seismic demand over structures.	Apply



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CourseName: CET468CLIMATE CHANGE AND SUSTAINABILITY	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET468.1	Explain the fundamental concepts of climate and its influencing factors	Understand
CET468.2	Explain the factors affecting climate change and the harmful impacts due to climate change	Understand
CET468.3	Discuss the problems due to urbanization and the need for sustainable development	Understand
CET468.4	Demonstrate the various adaptation and mitigation techniques for combating climate change	Understand
CET468.5	Discuss multilateral agreements on climate change, Case studies on Climate change	Understand

CourseName: CED416PROJECT PHASE II	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CED416.1	Model and solve real world problems by applying knowledge across domains	Create
CED416.2	Develop products, processes or technologies for sustainable and socially relevant applications	Create
CED416.3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks	Create
CED416.4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms	Create
CED416.5	Identify technology/research gaps and propose innovative/creative solutions	Create
CED416.6	Organize and communicate technical and scientific findings effectively in written and oral forms	Create


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CourseName: CET404COMPREHENSIVE VIVA VOCE	Regulation: 2019 Scheme
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COURSE OUTCOMES

COs	Description	Taxonomy
CET404.1	Prepare for a competitive examination	Remember
CET404.2	Analyze the comprehensive knowledge gained in basic courses in the field of Civil Engineering	Apply



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COURSE OUTCOMES of 2019 CURRICULUM

SEMESTER I	
COURSE: MAT 101 LINEAR ALGEBRA AND CALCULUS	
MAT101.1	Solve the consistent system of linearequations and to determine the nature ofquadratic form.
MAT101.2	Determine the maxima and minima of multivariable functions
MAT101.3	Determine areas and volumes of geometrical shapes, mass and centre ofgravity of plane laminas using multipleintegrals
MAT101.4	Determine whether a given series isconvergent, absolutely convergent orconditionally convergent
MAT101.5	Determine the Taylor and Fourier seriesexpansion.

COURSE: PHT100 ENGINEERING PHYSICS A	
PHT100.1	Compute the quantitative aspects of waves and oscillationsin engineering systems
PHT100.2	Apply the interaction of light with matter throughinterference, diffraction and identify these phenomena indifferent natural optical processes and optical instruments
PHT100.3	Examine the behavior of matter in the atomic andsubatomic level through the principles of quantummechanics to perceive the microscopic processes in electronic devices
PHT100.4	Classify the properties of magnetic materials and applyvector calculus to static magnetic fields and use Maxwell's equations to diverse engineering problems
PHT100.5	Examine the principles behind various superconductingapplications, explain the working of solid state lightingdevices and fibre optic communication system

COURSE: EST100 ENGINEERING MECHANICS	
EST100.1	Explain principles and theorems related to rigid body mechanics
EST100.2	Describe the components of system of forces acting on the rigid body
EST100.3	Apply the conditions of equilibrium to various practical problems involving different force system.
EST100.4	Choose appropriate theorems, principles or formulae to solve problems of mechanics.
EST100.5	Brief about dynamics and mechanical vibrations,solve simple numerical related to it



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COURSE: EST 120BASICS OF CIVIL ANDMECHANICAL ENGINEERING	
EST 120.1	Recall the role of civil engineer in society to relate the variousdisciplines of Civil Engineering and types of buildings, area and its functions, rules and regulations.
EST 120.2	Describe the importance, objectives and principles ofsurveying and to explain different types of building materialsused for construction
EST 120.3	Describe about the building construction, and summarizeabout the basic infrastructure services and green buildings.
EST 120.4	Analyse thermodynamic cycles and to explain the features andworking of IC engines.
EST 120.5	Explain the basic principles of refrigeration & air conditioningand the working of various hydraulic machines.
EST 120.6	Explain the basic manufacturing, metal joining and machiningprocesses.

COURSE: HUN 101 LIFE SKILLS	
HUN101.1	Define and Identify different life skills required in personal and professional life.
HUN101.2	Develop an awareness of the self and apply well-defined techniques to cope with emotions and stress
HUN101.3	Explain the basic mechanics of effective communication and demonstrate these through presentations.
HUN101.4	Take part in group discussions.
HUN101.5	Use appropriate thinking and problem solving techniques to solve new problems.
HUN101.6	Understand the basics of teamwork and leadership

COURSE: ESL 120 CIVIL AND MECHANICAL WORKSHOP	
ESL 120.1	Name and explain the use of various tools and devices for various civil engineering field measurements
ESL 120.2	Demonstrate the steps involved in basic civil engineering activities like plot measurement, setting out operation, evaluating the natural profile of land, plumbing and undertaking simple construction work
ESL 120.3	Choose materials and methods required for basic civil engineering activities like field measurements, masonry work and plumbing.
ESL 120.4	Identify Basic Mechanical workshop operations in accordance with the material and objects
ESL 120.5	Apply appropriate Tools and Instruments with respect to the mechanical workshop trades.
ESL 120.6	Apply appropriate safety measures with respect to the mechanical workshop trades.



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COURSE: PHL 120ENGINEERING PHYSICS LAB	
PHL120.1	Develop analytical/experimental skills and impart prerequisite hands on experience for engineering laboratories
PHL120.2	Understand the need for precise measurement practices for data recording
PHL120.3	Understand the principle, concept, working and applications of relevant technologies and comparison of results with theoretical calculations
PHL120.4	Analyze the techniques and skills associated with modern scientific tools such as lasers and fiber optics

SEMESTER II	
COURSE: MAT102 VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	
MAT102.1	Apply the concept of vector functions and learn to work with conservative vector field
MAT102.2	Apply computing integrals of scalar and vector field over surfaces in three-dimensional space.
MAT102.3	Solve homogeneous and non-homogeneous linear differential equation with constant
MAT102.4	Apply Laplace transforms to solve physical problems arising in engineering
MAT102.5	Apply Fourier transforms to solve physical problems arising in engineering

COURSE: CYT 100 ENGINEERING CHEMISTRY	
CYT 100.1	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields.
CYT 100.2	Understand various spectroscopic techniques like UV-Visible, IR, NMR and its applications.
CYT 100.3	Understand the knowledge of analytical method for characterizing a chemical mixture or a compound. Understand the basic concept of SEM for surface characterization of nanomaterials.
CYT 100.4	Understand the knowledge of stereochemistry, conducting polymers and advanced polymers in engineering.
CYT 100.5	Apply the knowledge of different types of water treatment methods to develop skills for treating wastewater

COURSE: EST 110ENGINEERING GRAPHICS	
EST 110.1	To able to draw the projection of points and lines located in different quadrants
EST 110.2	To able prepare multi view orthographic projections of objects by visualizing them in different positions
EST 110.3	To able to draw sectional views and develop surfaces of a given object
EST 110.4	To prepare pictorial drawings using the principles of isometric.



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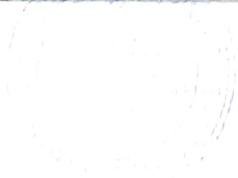
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EST 110.5	To convert 3D views to orthographic views and vice versa and perspective projections to visualize objects in three dimensions
EST 110.6	To obtain multi view projections and solid models of objects using CAD tools

COURSE: EST102 PROGRAMMING IN C	
EST 102.1	Analyze a computational problem and develop an algorithm/flowchart to find its solution
EST 102.2	Develop readable* C programs with branching and looping statements, which uses Arithmetic, Logical, Relational or Bitwise operators.
EST 102.3	Write readable C programs with arrays, structure or union for storing the data to be processed.
EST 102.4	Divide a given computational problem into a number of modules and develop a readable multi-function C program by using recursion if required, to find the solution to the computational problem
EST 102.5	Write readable C programs using pointers and files

EST130 BASICS OF ELECTRICAL AND ELECTRONICS	
EST130.1	Apply fundamental concepts and circuit laws to solve simple DC electric circuits
EST130.2	Develop and solve models of magnetic circuits
EST130.3	Apply the fundamental laws of electrical engineering to solve simple ac circuits in steady state
EST130.4	Explain passive and active components of various semiconductor devices
EST130.5	Describe the working of rectifiers, amplifiers and basic electronic instrumentation system
EST130.6	Explain the principle of radio communication, antenna and mobile communication.

COURSE: HUN102 PROFESSIONAL COMMUNICATION	
HUN102.1	Develop vocabulary and language skills relevant to engineering as a profession
HUN102.2	Analyze, interpret and effectively summarize a variety of textual content
HUN102.3	Create effective technical presentations
HUN102.4	Discuss a given technical/non-technical topic in a group setting and arrive at generalizations/consensus



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HUN102.5	Identify drawbacks in listening patterns and apply listening techniques for specific needs
HUN102.6	Create professional and technical documents that are clear and adhering to all the necessary conventions

ESL130 BASICS OF ELECTRICAL AND ELECTRONICS WORKSHOP	
ESL130.1	Explain various positional number systems and binary codes
ESL130.2	Relate basic postulates of Boolean algebra and show the correlation between Boolean expression
ESL130.3	Discuss various logic families and their characteristics
ESL130.4	Identify and test basic electronic components used in simple electronic circuits.
ESL130.5	Draw circuit schematics with EDA tools to fabricate single sided PCB.
ESL130.6	Assemble circuits on general purpose PCB.
ESL130.7	Work in a team and produce good technical documentation of experiments.

COURSE: CYL120 ENGINEERING CHEMISTRY LAB	
CYL120.1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses.
CYL120.2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs.
CYL120.3	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.
CYL120.4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis

SEMESTER III	
COURSE: ECT201 SOLID STATE DEVICES	
ECT201.1	Apply FermiDirac Distribution function and Compute carrier concentration at equilibrium and the parameters associated with generation, recombination and transport mechanism
ECT201.2	Explain drift and diffusion currents in extrinsic semiconductors and Compute current density due to these effects.
ECT201.3	Define the current components and derive the current equation in a pn junction diode and bipolar junction transistor.
ECT201.4	Explain the basic MOS physics and derive the expressions for drain current in linear and saturation regions.
ECT201.5	Discuss scaling of MOSFETs and short channel effects.



COURSE: EC MAT 201	
MAT 201.1	Solve the partial differential equation.
MAT 201.2	Analyse and solve one dimensional wave equation and heat equation.
MAT 201.3	Determine the continuity and differentiability of complex functions using Cauchy Riemann equations
MAT 201.4	Evaluate complex integrals using Cauchy's integral theorem and Cauchy's integral formula
MAT 201.5	Apply residue theorem to compute several kinds of real integrals of complex function.

COURSE: ECT 203 LOGIC CIRCUIT DESIGN	
ECT203.1	Work with a positional number systems and numeric representations
ECT203.2	Introduce basic postulates of Boolean algebra and show the correlation between Boolean expression
ECT203.3	Analyse and design various combinational circuits
ECT203.4	Design and implement various synchronus sequential circuits
ECT203.5	Understand various logic families and their characteristics

COURSE: ECT205 NETWORK THEORY	
ECT205.1	Apply basic Kirchhoff's law in mesh and node analysis to solve linear AC/DC network circuit.
ECT205.2	Apply network theorems to solve linear AC/DC network circuit.
ECT205.3	Apply Laplace transforms to carry out transient analysis, with and without initial conditions, in RLC circuits.
ECT205.4	Apply network functions to analyze single port and two port network.
ECT205.5	Represent any twoport network by Impedance, Admittance, Transmission and Hybrid network parameters.
ECT205.6	Apply basic Kirchhoff's law in mesh and node analysis to solve linear AC/DC network circuit.



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ASSISTANT PROFESSOR
 NETWORK THEORY

COURSE: HUT200 PROFESSIONAL ETHICS	
HUT200.1	Understand the core values that shape the ethical behaviour of a professional
HUT200.2	Adopt a good character and follow an ethical life
HUT200.3	Explain the role and responsibility in technological development by keeping personal ethics and legal ethics
HUT200.4	Solve moral and ethical problems through exploration and assessment by established experiments
HUT200.5	Understand the various ethical areas and how engineers can be good leaders

COURSE: MCN201 SUSTAINABLE ENGINEERING	
MCN201.1	Understand the relevance and the concept of sustainability and the global initiatives
MCN201.2	Identify the different types of environmental pollution problems and their sustainable solutions
MCN201.3	Discuss the environmental regulations and standards
MCN201.4	Outline the concepts related to conventional and nonconventional energy
MCN201.5	Demonstrate the broad perspective of sustainable practices by utilizing engineering knowledge and principles

COURSE: ECL 201 SCIENTIFIC COMPUTING LAB	
ECL201.1	Familiarize one programming language for scientific computing.
ECL201.2	Implement Array and Matrix operations using one programming language.
ECL201.3	Solve numerical integration, differentiation and ordinary differential equations for engineering applications.
ECL201.4	Realize how periodic functions are constituted by sinusoids.
ECL201.5	Simulate random processes and understand their statistics.




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SEMESTER IV

COURSE: MAT 204 PROBABILITY, RANDOM PROCESS AND NUMERICAL METHODS

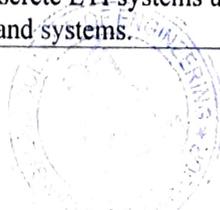
MAT204.1	Apply the Concept of random variables using Discrete probability distributions with practical applications in engineering and social life situations
MAT204.2	Apply the concepts of random variables using Continuous probability distributions with practical applications in engineering and social life situations
MAT204.3	Apply the concepts of random variables using joint probability distributions with practical applications in engineering and social life situations
MAT204.4	Apply the concepts of autocorrelation and power spectral density for analyzing random signals
MAT204.5	Analyzing and quantifying random phenomena using various models of random process.

COURSE: ECT 202 ANALOG CIRCUITS

ECT 202.1	Design R C circuits and BJT biasing circuits
ECT 202.2	Analyse small signal and high frequency equivalent circuits of BJT configuration using hybrid pi model.
ECT 202.3	Analyse small signal equivalent circuits of MOSFET circuits using hybrid pi model
ECT 202.4	Analyse and design various feedback amplifiers, oscillators and tuned amplifiers
ECT 202.5	Analyse and design power amplifiers and transistor based voltage regulators

COURSE: ECT 204 SIGNALS AND SYSTEMS

EC204.1	Apply the properties of signals and systems to classify them and describe orthogonality of signals and convolution integral.
EC 204.2	Represent signals with the help of Fourier series, Fourier transform and Laplace transform.
EC204.3	Apply transfer function to compute the LTI response to input signals.
EC204.4	Use the Nyquist sampling theorem for bandpass signal and calculate the sampling rate for aliasing free sampling of a signal.
EC204.5	Analyze Discrete LTI systems using Discrete Time Fourier Series (DTFS) and Discrete Time Fourier transforms (DTFT).
EC204.6	Analyze Discrete LTI systems using Z transforms and use simulation software for signals and systems.




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COURSE: ECT 206 COMPUTER ARCHITECTURE AND MICROCONTROLLERS	
EC206.1	Explain the functional units, I/O and memory management w.r.t. a typical computer architecture.
EC206.2	Explain 8051 architecture with addressing modes and instruction set.
EC206.3	Develop simple programs using assembly language programming embedded C.
EC206.4	Explain system software and Advanced RISC Machine Architecture.
EC206.5	Illustrate various memory systems and input/output organization.
EC206.6	Explain the functional units, I/O and memory management w.r.t. a typical computer architecture.

COURSE: MCN202 CONSTITUTION OF INDIA	
MCN202.1	Understand the background of the present constitution of India and features.
MCN202.2	Utilize the fundamental rights and duties.
MCN202.3	Understand the working of the union executive, parliament and judiciary.
MCN202.4	Utilize the special provisions and statutory institutions.
MCN202.5	Show national and patriotic spirit as responsible citizens of the country

COURSE:ECL 202 ANALOG CIRCUITS AND SIMULATION LAB	
ECL 202.1	Design and demonstrate the functioning of basic analog circuits using discrete components.
ECL 202 .2	Design and simulate the functioning of basic analog circuits using simulation tools.
ECL 202 .3	Function effectively as an individual and in a team to accomplish the given task.

COURSE:ECL 204 MICROCONTROLLER LAB	
ECL 204.1	Write an Assembly language program/Embedded C program for performing data manipulation
ECL 204.2	Develop ALP/Embedded C Programs to interface microcontroller with peripherals.
ECL 204.3	Perform programming/interfacing experiments with IDE for modern microcontrollers.



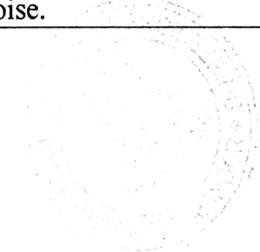

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COURSE: EST200 DESIGN & ENGINEERING	
EST200.1	Explain the different concepts and principles involved in design engineering.
EST200.2	Apply design thinking while learning and practicing engineering.
EST200.3	Develop innovative, reliable, sustainable and economically viable designs incorporating knowledge in engineering

SEMESTER V	
COURSE: ECT 301 LINEAR INTEGRATED CIRCUITS	
ECT 301.1	Understand Op Amp fundamentals and differential amplifier configuration
ECT 301.2	Familiarize the various types of feedbacks used in opamp circuits and Design operational amplifier circuits for various applications
ECT 301.3	Analyze and design of various waveform generators and filters
ECT 301.4	Explain the working and application of timer, VCO, and PLL ICs
ECT 301.5	Outline the working of voltage regulator IC's and Data converters

COURSE: ECT 303 DIGITAL SIGNAL PROCESSING	
ECT 303.1	State and prove the fundamental properties and relations relevant to DFT and solve basic problems involving DFT based filtering methods.
ECT 303.2	Compute DFT and IDFT using DIT and DIF radix2 FFT algorithms.
ECT 303.3	Design linear phase FIR filters and IIR filters for a given specification.
ECT 303.4	Illustrate the various FIR and IIR filter structures for the realization of the given system function and the basic multirate DSP operations.
ECT 303.5	Explain the architecture of DSP processor (TMS320C67xx) and the finite word length effects.

COURSE: ECT 305 ANALOG AND DIGITAL COMMUNICATION	
ECT 305.1	Apply the basic concepts for implementation of transmitter and receiver systems used in AM and FM.
ECT 305.2	Apply the basic concepts of information theory to analyze the various source coding techniques.
ECT 305.3	Identify the main components in a digital communication system and also apply the knowledge of pulse modulation technique for the transmission of data.
ECT 305.4	Understand the effects of Inter Symbol Interference during the transmission of binary data
ECT 305.5	Compare the digital modulation schemes and their detection in the presence of noise.



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COURSE: ECT 307 CONTROL SYSTEMS

ECT 307.1	Analyse electromechanical systems by mathematical modelling and derive their transfer functions
ECT 307.2	Determine Transient and Steady State behaviour of systems using standard test signals
ECT 307.3	Determine absolute stability and relative stability of a system
ECT 307.4	Apply frequency domain techniques to assess the system performance and to design a control system with suitable compensation techniques
ECT 307.5	Analyse system Controllability and Observability using state space representation

COURSE: HUT 300 INDUSTRIAL ECONOMICS AND FOREIGN TRADE

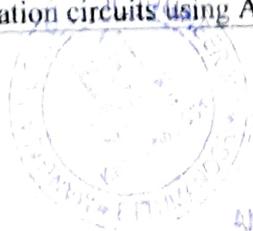
HUT 300.1	Explain the problem of scarcity of resources and consumer behaviour, and to evaluate the impact of government policies on the general economic welfare.
HUT 300.2	Take appropriate decisions regarding volume of output and to evaluate the social cost of production.
HUT 300.3	Determine the functional requirement of a firm under various competitive conditions.
HUT 300.4	Examine the overall performance of the economy, and the regulation of economic fluctuations and its impact on various sections in the society.
HUT 300.5	Determine the impact of changes in global economic policies on the business opportunities of a firm.

COURSE:MCN301 DISASTER MANAGEMENT

MCN301.1	Define and use various terminology in use in disaster management parlance and organize each of these term in relation to the disaster management cycle knowledge level.
MCN301.2	Distinguish between different hazards type and vulnerability type and do vulnerability assessment
MCN301.3	Identify the components and describe the process of risk assessment and apply appropriate methodologies to assess risk and response for it
MCN301.4	Discuss about stakeholder's role,communications and capacity related issues.
MCN301.5	Explain various legislations and best practices for disaster management and risk reduction at national and international level

COURSE: ECL 331 ANALOG INTEGRATED CIRCUITS AND SIMULATION LAB

ECL 331 .1	Use data sheets of basic Analog Integrated Circuits and design and implement application circuits using Analog ICs.
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ECL 331 .2	Design and simulate the application circuits with Analog Integrated Circuits using simulation tools.
ECL 331 .3	Function effectively as an individual and in a team to accomplish the given task.

COURSE:ECL 333 DIGITAL SIGNAL PROCESSING LAB	
ECL 333 .1	Simulate digital signals.Python/Scilab/MATLAB.
ECL 333 .2	verify the properties of DFT computationally
ECL 333 .3	Familiarize the DSP hardware and interface with computer.
ECL 333 .4	Implement LTI systems with linear convolution, block convolution and FFT.
ECL 333 .5	Implement FFT and IFFT and use it on real time signals.
ECL 333 .6	Implement FIR low pass filter.

SEMESTER VI

COURSE:ECT 302 ELECTROMAGNETICS	
ECT 302.1	Summarize the basic mathematical concepts related to electromagnetic vector fields.
ECT 302.2	Analyse Maxwell's equation in different forms and apply them to diverse engineering problems
ECT 302.3	Analyse electromagnetic wave propagation and wave polarization
ECT 302.4	Analyse the characteristics of transmission lines and solve the transmission line problems using Smith chart.
ECT 302.5	Analyse and evaluate the propagation of EM waves in Wave guides.

COURSE:ECT 304 VLSI CIRCUIT DESIGN	
ECT 304.1	Explain the various methodologies in ASIC and FPGA design
ECT 304.2	Design VLSI Logic circuits with various MOSFET logic families.
ECT 304.3	Compare different types of memory elements.
ECT 304.4	Design various Adders and multipliers.
ECT 304.5	Explain MOSFET fabrication techniques and layout design rules.

COURSE:ECT 306 INFORMATION THEORY AND CODING

ECT 306.1	Apply the basics concepts of information theory to analyze the various source coding techniques
ECT 306.2	Analyze various coding schemes,different types of channel and their capacity
ECT 306.3	Apply the basics knowledge of error detection and error correction using linear block codes .
ECT 306.4	Apply the basics knowledge of error detection and error correction using cyclic codes.
ECT 306.5	Apply the basics knowledge of error detection and error correction using convolution codes.

COURSE: ECT 362 Introduction to MEMS

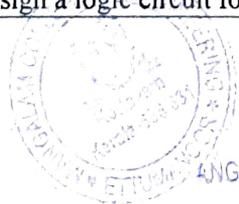
ECT 362.1	Describe the working principles of micro sensors and actuators
ECT 362.2	Identify commonly used mechanical structures in MEMS
ECT 362.3	Explain the application of scaling laws in the design of micro systems
ECT 362.4	Identify the typical materials used for fabrication of micro systems
ECT 362.5	Explain the principles of standard micro fabrication techniques
ECT 362.6	Explain the challenges in the design and fabrication of Micro systems

COURSE:HUT310MANAGEMENT FOR ENGINEERS

HUT310.1	Explain the characteristics of management in the contemporary context
HUT310.2	Describe the functions of management
HUT310.3	Demonstrate ability in decision making process and productivity analysis
HUT310.4	Illustrate project management technique and develop a project schedule
HUT310.5	Summarize the functional areas of management
HUT310.6	Comprehend the concept of entrepreneurship and create business plans

COURSE: ECT 308 COMPREHENSIVE COURSE WORK

ECT 308.1	Apply the knowledge of circuit theorems and solid state physics to solve the problems in electronic Circuits
ECT 308.2	Design a logic circuit for a specific application



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ECT 308.3	Design linear IC circuits for linear and nonlinear circuit applications. Explain basic signal processing operations and Filter designs Explain existent analog and digital communication systems
ECT 308.4	
ECT 308.5	

COURSE: ECL 332 COMMUNICATION LAB

ECL 332.1	Setup prototype circuits for waveform coding and digital modulation techniques.
ECL 332.2	Simulate the error performance of a digital communication system using standard modulation schemes.
ECL 332.3	Emulate a communication system with software designed radio hardware and necessary control software.

COURSE: ECD 334 MINIPROJECT

ECD 334.1	Be able to practice acquired knowledge within the selected area of technology for project development.
ECD 334.2	Identify, discuss and justify the technical aspects and design aspects of the project with a systematic approach.
ECD 334.3	Reproduce, improve and refine technical aspects for engineering projects.
ECD 334.4	Work as a team in development of technical projects.
ECD 334.5	Communicate and report effectively project related activities and findings.

SEMESTER VII

COURSE: ECT 401 MICROWAVES AND ANTENNAS

ECT 401.1	Understand the basic concept of antennas and its parameters
ECT 401.2	Analyse the far field pattern of Short dipole and half wave dipole antenna
ECT 401.3	Design of various broad band antennas
ECT 401.4	Illustrate the principle of operation of cavity resonators and various microwave sources.
ECT 401.5	Explain various microwave hybrid circuits and microwave semiconductor devices.

COURSE: ECT 413 Optical Fiber Communication

ECT 413.1	Understand the working and classification of optical fibres in terms of propagation modes.
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ECT 413.2	Understand various transmission characteristics and losses in optical fibres.
ECT 413.3	Understand the constructional features and the characteristics of optical sources.
ECT 413.4	Understand the working principle of various optical amplifiers and their performance comparison
ECT 413.5	Understand the concept of WDM, FSO and LiFi

COURSE: EET435 RENEWABLE ENERGY SYSTEMS

EET435.1	Choose the appropriate energy source depending on the available resources.
EET435.2	Explain the concepts of solar thermal and solar electric systems.
EET435.3	Illustrate the operating principles of wind, and ocean energy conversion systems.
EET435.4	Outline the features of biomass and small hydro energy resources
EET435.5	Describe the concepts of fuel cell and hydrogen energy technologies

COURSE: ECL 411 ELECTROMAGNETICS LAB

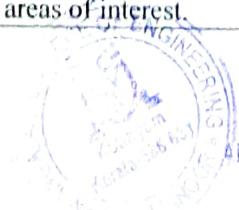
ECL 411.1	Analyse the basic Microwave components, microwave measurements and its parameters.
ECL 411.2	Understand the principles of fiberoptic communications and the different kind of losses, signal distortion and other signal degradation factors.
ECL 411.3	Simulate basic antenna experiments with simulation tools.

COURSE: MCN401 INDUSTRIAL SAFETY ENGINEERING

MCN401.1	Describe the theories of accident causation and preventive measures of industrial accidents
MCN 401 .2	Explain about personal protective equipment, its selection, safety performance and indicators and importance of house keeping
MCN 401 .3	Explain different issues in construction industries
MCN 401 .4	Describe the various hazards associated with different machines and mechanical material handling
MCN 401 .5	Utilize different hazard identification tools in different industries in the knowledge of different types of chemical hazards.

COURSE: ECQ 413 SEMINAR

ECQ413.1	Identify academic documents from the literature which are related to her/his areas of interest.
ECQ413.2	Read and apprehend an academic document from the literature which is related to her/ his areas of interest.



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ECQ413.3	Developing the content for presentation about an academic document
ECQ413.4	Presenting the academic document.
ECQ413.5	Developing a technical report related to content.

COURSE: ECD 415 PROJECT PHASE I

ECD415.1	Model and solve real world problems by applying knowledge across domains.
ECD415.2	Develop products, processes or technologies for sustainable and socially relevant applications.
ECD415.3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks.
ECD415.4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms.
ECD415.5	Identify technology/research gaps and propose innovative/creative solutions.
ECD415.6	Organize and communicate technical and scientific findings effectively in written and oral forms.

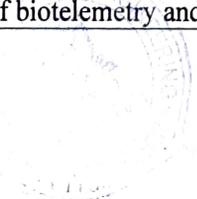
SEMESTER VIII

COURSE: ECT 402 WIRELESS COMMUNICATION

ECT 402.1	Understand the basics of cellular system and cellular design fundamentals.
ECT 402.2	Discuss various wireless channel models and capacity of wireless channels
ECT 402.3	Analysis of modulation techniques for flatfading channels and frequency selective channels
ECT 402.4	Illustrate various diversity techniques, equalization and discuss various multiple access techniques
ECT 402.5	Calculate system parameters in different modes of radio wave propagation.

COURSE: ECT414 BIOMEDICAL ENGINEERING

ECT414.1	Understand various anatomical and physiological functions of the human body and about the biopotentials produced in it.
ECT414.2	Understand about various biopotential electrodes and measurement of potential in ECG.
ECT414.3	Illustrate various techniques used for measurement of Blood flow, blood pressure and heart
ECT414.4	Understand the concept of recording of EEG, EMG and ERG signals and therapeutic devices.
ECT414.5	Describe the advances in medical imaging techniques, and understand the concepts of biotelemetry and patient safety.



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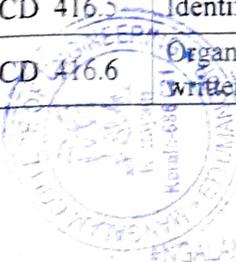
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ELECTRONICS

COURSE: ECT416 MODERN COMMUNICATION SYSTEMS	
ECT416.1	Explain OFDM, OFDMA AND SCFDMA techniques used in cellular communication
ECT416.2	Discuss the different wireless communication standards for short range communication
ECT416.3	Explain the IOT architecture and various connectivity technologies used in IOT systems
ECT416.4	Understand the various communication standards for connected autonomous vehicles
ECT416.5	Explain the significance and architecture of software defined radio and cognitive radio

COURSE: ECT 448 LOW POWER VLSI	
ECT 448.1	Identify various short channel effects and various sources of power dissipation in MOSFET
ECT 448.2	Apply various power reduction techniques to circuits
ECT 448.3	Apply various clocked styles for logic implementation.
ECT 448.4	Apply various non clocked design styles for logic implementation
ECT 448.5	Apply Adiabatic and reversible logic for circuit implementation.

COURSE: ECT 404 COMPREHENSIVE VIVA VOCE	
ECT 404.1	Improve their understanding of different subjects learnt in previous semesters
ECT 404.2	
ECT 404.3	Recall and Refresh fundamental concepts which they learn in different subjects.
	Enhance their interview facing skills

COURSE: ECD 416 PROJECT PHASE II	
ECD 416.1	Model and solve real world problems by applying knowledge across domains.
ECD 416.2	Develop products, processes or technologies for sustainable and socially relevant applications.
ECD 416.3	Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks.
ECD 416.4	Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms.
ECD 416.5	Identify technology/research gaps and propose innovative/creative solutions.
ECD 416.6	Organize and communicate technical and scientific findings effectively in written and oral forms.



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