



MALLA REDDY ENGINEERING COLLEGE AND MANAGEMENT SCIENCES

(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

Kistapur, Medchal, Medchal Dist – 501 401, Telangana – India.

Mobile No. 9346009393, 9346009494, 9346009595, Website: www.mrem.ac.in

Course Outcomes

Branch: Civil Engineering

Regulations: R-16

S.N O	Year/ Sem	Course Code	Course Name	Course Name
1	I/I	MA101BS	MATHEMATICS - I	CO1: write the matrix representation of a set of linear equations and to analyze the solution of the system of equations
				CO2: find the Eigen values and Eigen vectors which come across under linear transformations
				CO3: find the extreme values of functions of two variables with/ without constraints.
				CO4: identify whether the given first order DE is exact or not
				CO5: solve higher order DE's and apply them for solving some real world problems
2	I/I	MA102BS/ MA202BS	MATHEMATICS- II	CO1: use Laplace transform techniques for solving DE's
				CO2: evaluate integrals using Beta and Gamma functions
				CO3: evaluate the multiple integrals and can apply these concepts to find areas, volumes, moment of inertia etc. of regions on a plane or in space
				CO4: evaluate the line, surface and volume integrals and converting them from one to another
				CO5: the basic properties of vector valued functions and their applications to line, surface and volume integrals.
3	I/I	PH103BS	ENGINEERING PHYSICS/ENGINE ERING PHYSICS -	CO1: Realize the importance of light phenomena in thin films and resolution
				CO2: Learn principle, working of various laser systems and light propagation through optical fibers.



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			I	CO3:Distinguish various crystal systems and understand atomic packing factor.
				CO4:Know the various defects in crystals.
				CO5:To study various crystal imperfections and probing methods like X-RD.
4	I/I	CS104ES/ CS204ES	COMPUTER PROGRAMMING IN C	CO1: Demonstrate the basic knowledge of computer hardware and software
				CO2:Ability to write algorithms for solving problems
				CO3:Ability to draw flowcharts for solving problems.
				CO4:Ability to code a given logic in C programming language
				CO5:Gain knowledge in using C language for solving problems.
5	I/I	ME105ES	ENGINEERING MECHANICS	CO1: To understand the resolving forces and moments for a given force system
				CO2:To analyze the types of friction for moving bodies and problems related to friction.
				CO3:To determine the centroid and second moment of area
				CO4:To determine the Mass Moment of Inertia
				CO5:To determine the Work-energy and power.
6	I/I	ME106ES/ ME205ES	ENGINEERING GRAPHICS	CO1: Ability to prepare working drawings to communicate the ideas and information.
				CO2:To impart knowledge about standard principles of orthographic projection of objects.
				CO3:To draw sectional views and pictorial views of solids.
				CO4:To draw sectional views and pictorial views of Sections and Developments.
				CO5:To draw sectional views and pictorial views of Isometric & Orthographic Projections.
7	I/I	PH107BS/ PH207BS	ENGINEERING PHYSICS LAB	CO1: Develop skills to impart practical knowledge in real time solution
				CO2:Understand principle, concept, working and application of new technology and comparison of results with theoretical calculations



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				CO3:Design new instruments with practical knowledge
				CO4:Gain knowledge of new concept in the solution of practical oriented problems and to understand more deep knowledge about the solution to theoretical problems.
				CO5:Understand measurement technology, usage of new instruments and real time applications in engineering studies
8	I/I	CS108ES/ CS208ES	COMPUTER PROGRAMMING IN C LAB	CO1: To write programs in C using structured programming approach to solve the problems
				CO2:Ability to design and test programs to solve mathematical and scientific problems.
				CO3:Ability to design and test programs to solve mathematical and scientific problems.
				CO4:Ability to write structured programs using control structures and functions.
				CO5:Ability to write structured programs using control structures and functions.
9	I/II	AP201BS	APPLIED PHYSICS	CO1: Realize the importance of elastic behavior of materials.
				CO2:Learn Sabine's formula for reverberation time and apply in architecture of buildings.
				CO3:Learn various methods of producing ultrasonics and their uses
				CO4:Learn magnetic, dielectric and superconducting properties of materials and their applications.
				CO5:Learn magnetic, dielectric and superconducting properties of materials and their applications.
10	I/II	CH102BS/ CH202BS	ENGINEERING CHEMISTRY	CO1: To bring adaptability to new developments in Engineering Chemistry and to acquire the skills required to become a perfect engineer
				CO2:To include the importance of water in industrial usage, significance of corrosion control to protect the structures, polymers and their controlled usage
				CO3:To acquire knowledge of engineering materials and about Electrode.



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				CO4:To acquire required knowledge about engineering materials like cement, refractories and composites....
				CO5:To acquire required knowledge about engineering materials like cement, refractories and composites..
11	I/II	MA203BS	Mathematics - III	CO1: differentiate among random variables involved in the probability models which are usefull for all branches of engineering
				CO2:calculate mean, proportions and variances of sampling distributions and to make important decisions s for few samples which are taken from a large data s
				CO3:solve the tests of ANOVA for classified data
				CO4:find the root of a given equation and solution of a system of equations
				CO5:find the numerical solutions for a given first order initial value problem
12	I/II	EN104HS/ EN204HS	PROFESSIONAL COMMUNICATIO N IN ENGLISH	CO1: Improve the language proficiency of students in English with an emphasis on Vocabulary, Grammar, Reading and Writing skills.
				CO2:Equip students to study academic subjects more effectively using the theoretical and Practical components of English syllabus.
				CO3:Develop study skills and communication skills in formal and informal situations
				CO4:Comprehend the given texts and respond appropriately
				CO5:Communicate confidently in formal and informal contexts.
13	I/II	EE106ES/ EE205ES	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	CO1: To introduce the concept of electrical circuits and its components
				CO2:To introduce the concepts of diodes & transistors, and
				CO3:To impart the knowledge of various configurations, characteristics and application
				CO4:To analyze and solve electrical circuits using network laws and theorems
				CO5:To identify and characterize diodes and various types of transistors.



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14	I/II	CH206BS:	ENGINEERING CHEMISTRY LAB	CO1: To bring adaptability to new developments in Engineering Chemistry and to acquire the skills required to become a perfect engineer
				CO2: To include the importance of water in industrial usage, significance of corrosion control to protect the structures, polymers and their controlled usage
				CO3: To acquire knowledge of engineering materials and about Electrode.
				CO4: To acquire required knowledge about engineering materials like cement, refractories and composites....
				CO5: To acquire required knowledge about engineering materials like cement, refractories and composites.
15	I/II	PCE107H S/PCE207 HS	ENGLISH LANGUAGE COMMUNICATIO N SKILLS LAB	CO1: To facilitate computer-assisted multi-media instruction enabling individualized and independent language learning
				CO2: To sensitize the students to the nuances of English speech sounds, word accent, intonation and rhythm
				CO3: To bring about a consistent accent and intelligibility in students' pronunciation of English by providing an opportunity for practice in speaking
				CO4: Neutralization of accent for intelligibility
				CO5: Speaking skills with clarity and confidence which in turn enhances their employability skills.
16	I/II	ME108ES/ ME208ES	ENGINEERING WORKSHOP	CO1: To Study of different hand operated power tools, uses and their demonstration
				CO2: Study and practice on machine tools and their operations
				CO3: Practice on manufacturing of components using workshop trades including plumbing, fitting, carpentry, foundry, house wiring and welding.
				CO4: Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.



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				CO5: Apply basic electrical engineering knowledge for house wiring practice..
17	II/I	MA301BS	MATHEMATICS - IV	CO1: analyse the complex functions with reference to their analyticity, integration using Cauchy's integral theorem
				CO2: find the Taylor's and Laurent's series expansion of complex functions
				CO3: the bilinear transformation
				CO4: express any periodic function in term of sines and cosines
				CO5: express a non-periodic function as integral representation
18	II/I	CE302ES	STRENGTH OF MATERIALS - I	CO1: Analyze the statically determinate and indeterminate problems
				CO2: Determine the stresses and strains in the members subjected to axial, bending.
				CO3: Evaluate the slope and deflection of beams subjected to loads.
				CO4: Determine the principal stresses in structural members
				CO5: Determine the principal strains in structural members.
19	II/I	CE303ES	FLUID MECHANICS - I	CO1: Apply conservation laws to derive governing equations of fluid flows.
				CO2: Compute hydrostatic and hydrodynamic forces.
				CO3: Analyze and design simple pipe systems.
				CO4: Apply principles of dimensional analysis to design experiments.
				CO5: Compute drag and lift coefficients.
20	II/I	CE304ES	BUILDING MATERIALS, CONSTRUCTION AND PLANNING	CO1: At the end of the course, the student will be able to identify various building materials required for construction & planning
				CO2: Demonstrate the ability to know about different materials such as stones, bricks, Tiles, wood, aluminum, glass & paints and their classification, manufacture and structural requirements
				CO3: Ability to know about the materials used in making of concrete such as cement and



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				admixtures.
				CO4: Ability to know about tests on cement such as field and lab tests and uses of cement and admixtures.
				CO5: students will demonstrate various building services such as plumbing services, sanitary and ventilations.
21	II/I	CE305ES	SURVEYING	CO1: Calculate angles, distances and levels
				CO2: Identify data collection methods and prepare field notes
				CO3: Understand the working principles of survey instruments
				CO4: Estimate measurement errors and apply corrections
				CO5: Interpret survey data and compute areas and volumes
22	II/I	CE306ES	STRENGTH OF MATERIALS LAB	CO1: Conduct tension test on Materials like steel etc.
				CO2: Conduct compression tests on spring, wood and concrete
				CO3: Conduct flexural and torsion test to determine elastic constants
				CO4: evaluate properties of materials by tensile test
				CO5: Determine hardness of metals
23	II/I	CE307ES	COMPUTER AIDED DRAFTING LAB	CO1: Introduction to computer aided drafting
				CO2: Software for CAD – Introduction to different softwares
				CO3: Practice exercises on CAD software
				CO4: Drawing of plans of buildings using software a) Single storied buildings b) multi storied buildings
				CO5: Developing sections and elevations for a) Single storied buildings b) multi storied buildings
24	II/I	CE308ES	SURVEYING	CO1: Practically able to draw plans & maps to determine the areas before taking up any



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			LAB – I	<p>civil engineering works.</p> <p>CO2: Calculation of areas, Drawing plans and contour maps using different measuring equipment at field level</p> <p>CO3: Write a technical laboratory report•</p> <p>CO4: Apply the principle of surveying for civil Engineering Applications</p> <p>CO5: Able to determine the location of any point horizontally and vertically using</p>
25	II/I	*MC300HS	GENDER SENSITIZATION LAB.	<p>CO1: Students will have developed a better understanding of important issues related to gender in contemporary India.</p> <p>CO2: Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.</p> <p>CO3: Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.</p> <p>CO4: Students will acquire insight into the gendered division of labour and its relation to politics and economics.</p> <p>CO5: Men and women students and professionals will be better equipped to work and live together as equals.</p>
26	II/II	CE401ES	STRENGTH OF MATERIALS – II	<p>CO1: Determine stresses in the member subjected to Torsion</p> <p>CO2:Analyze columns and struts</p> <p>CO3: Understand the concept of direct and bending stresses</p> <p>CO4:Analyze and design springs, thin and thick cylinders</p> <p>CO5: Understand the concept of unsymmetrical bending.</p>
27	II/II	CE402ES	FLUID	CO1: Understand the concepts o channel flows.



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			MECHANICS - II	<p>CO2: Compute flow profiles in channel transitions and analyze hydraulic transients</p> <p>CO3: Design the working proportions of hydraulic machines</p> <p>CO4: Understand the various properties of fluids and their influence on fluid motion and analyze a variety of problems in fluid statics and dynamics.</p> <p>CO5: Calculate the forces that act on submerged planes and curves.</p>
28	II/II	CE403ES	STRUCTURAL ANALYSIS	<p>CO1:Analyze Perfect , Imperfect And Redundant Frames</p> <p>CO2: Formulate Equilibrium and compatibility equations for structural members</p> <p>CO3:Analyze one dimensional and two dimensional problems using classical methods</p> <p>CO4:Analyze indeterminate structures</p> <p>CO5:Analyze structures for gravity loads, moving loads and lateral loads</p>
29	II/II	CV404ES	ENGINEERING GEOLOGY	<p>CO1: Understand weathering process and mass movement</p> <p>CO2: Distinguish geological formations</p> <p>CO3: Identify geological structures and processes for rock mass quality</p> <p>CO4: Identify subsurface information and groundwater potential sites through geophysical investigations</p> <p>CO5: Apply geological principles for mitigation of natural hazards and select sites for dams and tunnels</p>
30	II/II	SM405MS	BUSINESS ECONOMICS AND FINANCIAL ANALYSIS	<p>CO1: The students will understand the various Forms of Business and the impact of economic variables on the Business.</p> <p>CO2: The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.</p> <p>CO3: The Students can study the firm's financial position by analysing the Financial Statements of a Company.</p>



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				<p>CO4: Understand the elasticity of the demand of the product, different types, and measurement of elasticity of demand and factors influencing on elasticity of demand.</p> <p>CO5: Illustrate the features, merits and demerits of different forms of business organizations existing in the modern business.</p>
31	II/II	CE406ES	<p style="text-align: center;">FLUID MECHANICS LAB</p>	CO1: Determine coefficient of discharge for orifice and mouthpiece.
				CO2: Calibrate notches venturimeter orifice meters
				CO3: Determine minor losses in pipes
				CO4: Determine the fluid pressure and use various devices for measuring fluid pressure.
				CO5: Calculate hydrostatic force and use of law of conservation mass to fluid flow
32	II/II	CE408ES	<p style="text-align: center;">SURVEYING LAB - II</p>	CO1: Perform surveying on any civil engineering work
				CO2: Apply the principle of surveying for civil Engineering Applications
				CO3: Calculation of areas, Drawing plans and contour maps using different measuring equipment at field level
				CO4: Write a technical laboratory report
				CO5: Apply the knowledge of Theodolite in different operations in civil engineering projects
33	II/II	CV407ES	<p style="text-align: center;">ENGINEERING GEOLOGY LAB</p>	CO1: Study of physical properties and identification of minerals referred under theory.
				CO2: Megascopic description and identification of rocks referred under theory.
				CO3: Microscopic study of rocks.
				CO4: Interpretation and drawing of sections for geological maps showing tilted beds, faults, uniformities etc.
				CO5: Simple Structural Geology problems.
34	II/II	MC400ES	ENVIRONMENT	CO1: Based on this course, the Engineering graduate will understand /evaluate/develop



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			AL SCIENCE AND TECHNOLOGY	<p>technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development</p> <p>CO2: Identify environmental problems, evaluate problem solving strategies and develop science based solutions</p> <p>CO3: understand the need to integrate relevant social sciences</p> <p>CO4: Use acquired knowledge, skills and ingenuity to solve complex problems.</p> <p>CO5: To monitoring forest diversity and urban sprawl analysis by Remote Sensing and GIS Technology.</p>
35	III/I	CE501PC	CONCRETE TECHNOLOGY	<p>CO1: Identify Quality Control tests on concrete making materials</p> <p>CO2: Understand the behaviour of fresh and hardened concrete</p> <p>CO3: Design concrete mixes as per IS and ACI codes</p> <p>CO4: Understand the durability requirements of concrete</p> <p>CO5: Understand the need for special concretes</p>
36	III/I	CE502PC	DESIGN OF REINFORCED CONCRETE STRUCTURES	<p>CO1: Design RC Structural elements</p> <p>CO2: Design the Reinforced Concrete beams using limit state Design</p> <p>CO3: Design Reinforced Concrete slabs</p> <p>CO4: Design the Reinforced Concrete Columns and footings</p> <p>CO5: Design structures for serviceability</p>
37	III/I	CE503PC	WATER RESOURCES ENGINEERING	<p>CO1: Analyze hydro-meteorological data</p> <p>CO2: Estimate abstractions from precipitation</p> <p>CO3: Compute yield from surface and subsurface basin</p> <p>CO4: Formulate and solve hydrologic flood routing models</p> <p>CO5: Develop rainfall-runoff models</p>



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38	III/I	SM504MS	FUNDAMENTALS OF MANAGEMENT	CO1: The students understand the significance of Management in their Profession.
				CO2: The various Management Functions like Planning, Organizing, Staffing, Leading, Motivation and Control aspects are learnt in this course.
				CO3: The students can explore the Management Practices in their domain area.
				CO4: Demonstrate a basic understanding of management and its history.
				CO5: Demonstrate a basic understanding of the functions of management, to include planning, organizing, leading, and controlling
39	III/I	CE505PC	CONCRETE TECHNOLOGY LAB	CO1: Understand properties of concrete material, behavior of concrete & properties of fresh & hardened concrete
				CO2: Outline the importance of testing of cement and its properties
				CO3: Assess the different properties of aggregate.
				CO4: Summarize the concept of workability and testing of concrete
				CO5: Describe the preparation of green concrete.
40	III/I	CE506PC	GEOGRAPHICAL INFORMATION SYSTEMS LAB	CO1: At the end of the course, the student is exposed to spatial technologies, mapping the field problems and solution convergence through GIS.
				CO2: Compile a rectification / geo-referencing of scanned images by assigning latitudes and longitudes or x, y coordinates.
				CO3: Discriminate between spatial and non-spatial data and working with spatial data.
				CO4: Create mosaic of images / topo sheets / aerial photographs and preparation of thematic maps by process of digitization.
				CO5: Compute and manipulate with non-spatial data and spatial data.
41	III/I	CE507PC	HYDRAULICS	CO1: Compute drag coefficients



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			AND HYDRAULIC MACHINERY LAB	<p>CO2: Test the performance of pumps and turbines</p> <p>CO3: Determine Manning's and Chezy's coefficients for smooth and rough channels</p> <p>CO4: Determine Energy loss in Hydraulic jump and Calibrate standing wave flume</p> <p>CO5: identify importance of various fluid properties at rest and in transit</p>
42	III/I	MC500HS	PROFESSIONAL ETHICS	<p>CO1: The students will understand the importance of Values and Ethics in their personal lives and professional careers</p> <p>CO2: The students will learn the rights and responsibilities as an employee, team member and a global citizen.</p> <p>CO3: Identify the multiple ethical interests at stake in a real-world situation or practice</p> <p>CO4: Assess their own ethical values and the social context of problems</p> <p>CO5: Articulate what makes a particular course of action ethically defensible</p>
43	III/I	CE511OE	DISASTER MANAGEMENT (Open Elective - I)	<p>CO1: Understanding Disasters, man-made Hazards and Vulnerabilities</p> <p>CO2: Understanding disaster management mechanism</p> <p>CO3: Understanding capacity building concepts and planning of disaster managements</p> <p>CO4: Study and assess vulnerability of a geographical area.</p> <p>CO5: Students will be equipped with various methods of risk reduction measures and risk mitigation.</p>
44	III/II	CE601PC	DESIGN OF STEEL STRUCTURES	<p>CO1: Design tension and compression members</p> <p>CO2: Design beams and beam columns</p> <p>CO3: Design bolt and weld connections</p> <p>CO4: Design built up members and Column base</p> <p>CO5: Design of plate girders and Roof Trusses</p>
45	III/II	CE602PC	ENVIRONMENT	CO1: Analyze characteristics of water and wastewater



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			AL ENGINEERING	<p>CO2: Estimate the quantity of drinking water and domestic wastewater generated</p> <p>CO3: Design components of water supply systems Design seweragesystem</p> <p>CO4:The students will gain an experience in the implementation of <i>environmental Engineering</i> on <i>engineering</i> concepts</p> <p>CO5: Ability to recognize various biotic and abiotic <i>environmental</i> transformation processes of pollutants</p>
46	III/II	CE603PC	SOIL MECHANICS	<p>CO1: Understand the mechanism Behaviour of Soil for different loads</p> <p>CO2: from Soil Condition will be able to determine properties of soil</p> <p>CO3:identify the mechanism of soil formation. order the formation of different soil formation mechanisms</p> <p>CO4: Understanding of the basic application of the concepts of the soil mechanics</p> <p>CO5: Understanding of the Engineering behavior of the soil and different laboratory methods for determination of these engineering properties of soil.</p>
47	III/II	MT623OE	Industrial Management	<p>CO1:Explain the concepts of management and Explore the management practices in their domain area within society.</p> <p>CO2:Evaluate different types of organizational structures and Design them.</p> <p>CO3:Explain about product design process and Design product layout.</p> <p>CO4:Explain about method study and Use various work measurement methods.</p> <p>CO5:Draw various statistical quality control charts and Interpret them.</p>
48	III/II	CE612PE	ADVANCED STRUCTURAL ANALYSIS (Professional	<p>CO1: Demonstrate the concepts of qualitative influence line diagram for continuous beams and frames.</p> <p>CO2: Apply the methods of indeterminate truss analysis</p> <p>CO3: Demonstrate the behaviour of arches and their methods of analysis analyse cable</p>



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			Elective-I)	suspension bridges
				CO4: Analyse multi story frames subjected to gravity loads and lateral loads
				CO5: Design various air pollution control equipment and evaluate its use.
49	III/II	CE604PC	SOIL MECHANICS LAB	CO1: to Classify and evaluate the behavior of the soils subjected to various loads.
				CO2: Understanding of the basic properties of soil
				CO3: Understanding different laboratory methods for determination of these basic properties of soil.
				CO4: Understanding of the basic application of the concepts of the soil mechanics
				CO5: Understanding of the Engineering behavior of the soil and different laboratory methods for determination of these engineering properties of soil.
50	III/II	CE605PC	COMPUTER AIDED DRAFTING – II LAB	CO1: At the end of the course, the student will be able to Student can draft various structures
				CO2: Comprehend the fundamentals of building drawings and understand CAD software for drafting
				CO3: Draw Material, Sanitary, Electrical Symbols and various brick bonds by using drawing commands in CAD
				CO4: Draft the building components and sectional view of doors, windows and trusses
				CO5: Create the drawings of various trusses like King post truss
51	III/II	EN606HS	ADVANCED ENGLISH COMMUNICATI ON SKILLS (AECS) LAB	CO1: Acquire vocabulary and use it contextually
				CO2: Listen and speak effectively
				CO3: Develop proficiency in academic reading and writing
				CO4: Increase possibilities of job prospects
				CO5: Communicate confidently in formal and informal contexts



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52	IV/I	CE701PC	TRANSPORTATION ENGINEERING	CO1: Understand Plan highway networks
				CO2: Design highway geometrics.
				CO3: Design Intersections and prepare traffic management plans
				CO4: Design flexible and rigid pavements.
				CO5: Gain the facility of utilizing the state of the art techniques and models in the field.
53	IV/I	CE702PC	ESTIMATION, QUANTITY SURVEYING AND VALUATION	CO1: Do estimation of Buildings, Roads and Canals.
				CO2: Understand contracts and specification.
				CO3: Ascertain the quantity of materials required for Civil engineering works as per specifications.
				CO4: Prepare cost estimate and valuation of civil engineering works.
				CO5: Prepare quantity estimates for Buildings, roads & rails and canal structures as per specifications
54	IV/I	CE724PE	REHABILITATION AND RETROFITTING OF STRUCTURES (Professional Elective-II)	CO1: Develop various maintenance and repair strategies
				CO2: Evaluate the existing buildings through field investigations.
				CO3: Understand and use the different techniques for structural retrofitting
				CO4: Achieve the knowledge on quality of concrete, durability aspects, causes of deterioration
				CO5: Understanding different repairing materials and its techniques.
55	IV/I	CE733PE	GROUND IMPROVEMENT TECHNIQUES (Professional Elective - III)	CO1: Identify suitable ground improvement techniques for specific project and its implications.
				CO2: Understand about soil distribution in India and need of ground improvement techniques
				CO3: Understand and apply the suitable method of chemical stabilization



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				CO4: Understand different applications of geosynthetics and the suitable method of application
				CO5: Analyze and select effective method of soil reinforcement as well as grouting
56	IV/I	CS702OE	TRAFFIC ENGINEERING (Professional Elective - IV)	CO1: Understand basics principles of Traffic Engineering
				CO2: Analyze parking data and model accidents
				CO3: Determine capacity and LOS.
				CO4: To provide engineering techniques to achieve Safe and efficient movement of people and goods on roadways
				CO5: Carryout sampling data in conducting various surveys and analysis
57	IV/I	CE703PC	TRANSPORTATION ENGINEERING LAB	CO1: the student will be able to Asses for Highway construction properties of highway materials
				CO2: Identify engineering properties of aggregate
				CO3: Identify the grade & properties of bitumen
				CO4: Find out peak hour traffic & peak time for a given location on the road.
				CO5: Calculate design speed, maximum speed & minimum speed limits of a location through spot speed.
58	IV/I	CE704PC	ENVIRONMENTAL ENGINEERING LAB	CO1: Students will able to find various properties of water
				CO2: Understand about the equipment used to conduct the test procedures.
				CO3: Examine and Estimate water, waste water, air and soil Quality
				CO4: Develop a report on the quality aspect of the environment
59	IV/I	CE705PC	INDUSTRY ORIENTED MINI PROJECT	CO1: Apply his/her knowledge to understand the industrial applications
				CO2: Observe the process of problem identification its formulation and solution.
				CO3: Prepare a detailed report on the work carried



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				CO4: Present in front of the evaluation committee and other participants
				CO5: Present in front of the evaluation committee and other participants
60	IV/II	PE831OE	Disaster Management	CO1: Understanding Disasters, man-made Hazards
				CO2: Understanding Vulnerabilities
				CO3: Understanding disaster management mechanism
				CO4: Understanding capacity building concepts
				CO5: Understanding planning of disaster managements
61	IV/II	CE852PE	PAVEMENT DESIGN (Professional Elective - V)	CO1: Characterize the response characteristics of soil, aggregate, asphalt, and asphalt mixes
				CO2: Analyze flexible pavements
				CO3: Analyze rigid pavements
				CO4: Design a flexible pavement using IRC, Asphalt Institute, and AASHTO methods
				CO5: Design a rigid pavement using IRC, and AASHTO methods
62	IV/II	CS803OE	DATABASE MANAGEMENT SYSTEMS	CO1: Gain knowledge of fundamentals of DBMS, database design and normal forms
				CO2: Master the basics of SQL for retrieval and management of data.
				CO3: Be acquainted with the basics of transaction processing and concurrency control.
				CO4: Familiarity with database storage structures.
				CO5: access techniques
63	IV/II	CE864PE	Industrial Waste Water Treatment.	CO1: Identify the characteristics of industrial wastewaters
				CO2: Describe pollution effects of disposal of industrial effluent
				CO3: Identify treatment options for industrial wastewater
				CO4: design treatment options for industrial wastewater



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				CO5:Formulate environmental management plans
64	IV/II	CE801PC	MAJOR PROJECT	CO1: Develop comprehensive solution of issues identified in project stage-1 and to meet the requirements as stated in project brief.
				CO2: Synthesize the results of the detailed analytical studies conducted, lay down validity and design criteria, interpret the result for application to the problem, develop the concept and detailed design solution and to effectively communicate the thesis rationale.
				CO3: Demonstrate the knowledge, skills and attitudes of a professional engineer.
				CO4: Communicate with engineers and the community at large in written and oral forms.
				CO5: Able to write effective technical report and demonstrate through presentation