SSM INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi / Affiliated to Anna University, Chennai / Accredited by NAAC)
(Accredited by NBA – ECE, EEE & MECH UG Programs)
Dindigul – Palani Highway, Dindigul 624 002

Department of Civil Engineering
Anna University Regulations 2017
List of Course Names

S.No	Sem	Course Code	Subject Code	Subject Name
1	I	C101	HS8151	Communicative English
2	I	C102	MA8151	Engineering Mathematics- I
3	I	C103	PH8151	Engineering Physics
4	I	C104	CY8151	Engineering Chemistry
5	I	C105	GE8151	Problem Solving and Python Programming
6	I	C106	GE8152	Engineering Graphics
7	I	C107	GE8161	Problem Solving and Python Programming Laboratory
8	I	C108	BS8161	Physics and Chemistry Laboratory
9	II	C109	HS8251	Technical English
10	II	C110	MA8251	Engineering Mathematics- II
11	II	C111	PH8201	Physics for Civil Engineering
12	II	C112	BE8251	Basic Electrical and Electronics Engineering
13	II	C113	GE8291	Environmental Science and Engineering
14	II	C114	GE8292	Engineering Mechanics
15	II	C115	GE8261	Engineering Practices Laboratory
16	II	C116	CE8211	Computer Aided Building Drawing
17	III	C201	MA8353	Transforms and Partial Differential Equations
18	III	C202	CE8301	Strength of Materials I
19	III	C203	CE8302	Fluid Mechanics
20	III	C204	CE8351	Surveying
21	III	C205	CE8391	Construction Materials
22	III	C206	CE8392	Engineering Geology
23	III	C207	CE8311	Construction Materials Laboratory
24	III	C208	CE8361	Surveying Laboratory
25	III	C209	HS8381	Interpersonal Skills / Listening and Speaking
26	IV	C210	MA8491	Numerical Methods
27	IV	C211	CE8401	Construction Techniques and Practices
28	IV	C212	CE8402	Strength of Materials II
29	IV	C213	CE8403	Applied Hydraulic Engineering
30	IV	C214	CE8404	Concrete Technology
31	IV	C215	CE8491	Soil Mechanics
32	IV	C216	CE8481	Strength of Materials Laboratory
33	IV	C217	CE8461	Hydraulic Engineering Laboratory

34	IV	C218	HS8461	Advanced Reading and Writing
35	V	C301	CE8501	Design of Reinforced Cement Concrete Elements
36	V	C302	CE8502	Structural Analysis I
37	V	C303	EN8491	Water Supply Engineering
38	V	C304	CE8591	Foundation Engineering
39	V	C305 (PE I-1)	GI8012	Digital Cadastre
40	V	C305 (PE I-2)	GI8013	Advanced Surveying
41	V	C305 (PE I-3)	GI8014	Geographic Information System
42	V	C305 (PE I-4)	GI8015	Geoinformatics Applications for Civil Engineers
43	V	C305 (PE I-5)	GI8491	Total Station and GPS Surveying
44	V	C305 (PE I-6)	GE8071	Disaster Management
45	V	C305 (PE I-7)	GE8074	Human Rights
46	V	C306 (OE I-1)	OAI751	Agricultural Finance, Banking and Co-operation
47	V	C306 (OE I-2)	OEE751	Basic Circuit Theory
48	V	C306 (OE I-3)	OGI751	Climate Change and its Impact
49	V	C306 (OE I-4)	OCS751	Data Structures and Algorithms
50	V	C306 (OE I-5)	OML752	Electronic Materials
51	V	C306 (OE I-6)	OCE751	Environmental and Social Impact Assessment
52	V	C306 (OE I-7)	OAE751	Fundamentals of Combustion
53	V	C306 (OE I-8)	OGI752	Fundamentals of Planetary Remote Sensing
54	V	C306 (OE I-9)	OEN751	Green Building Design
55	V	C306 (OE I-10)	OAI752	Integrated Water Resources Management
56	V	C306 (OE I-11)	OEI 751	Introduction to Embedded Systems
57	V	C306 (OE I-12)	OMF751	Lean Six Sigma

58	V	C306 (OE I-13)	OAN751	Low-Cost Automation
59	V	C306 (OE I-14)	OMT751	MEMS and NEMS
60	V	C306 (OE I-15)	ORO751	Nano Computing
61	V	C306 (OE I-16)	OAE752	Principles of Flight Mechanics
62	V	C306 (OE I-17)	OCH751	Process Modeling and Simulation
63	V	C306 (OE I-18)	OAT751	Production of Automotive Components
64	V	C306 (OE I-19)	OIE751	Robotics
65	V	C306 (OE I-20)	OML753	Selection of Materials
66	V	C306 (OE I-21)	OML751	Testing of Materials
67	V	C306 (OE I-22)	OAT752	Vehicle Styling and Design
68	V	C306 (OE I-23)	OTT751	Weaving Mechanisms
69	V	C306 (OE I-24)	OMV751	Marine Vehicles
70	V	C307	CE8511	Soil Mechanics Laboratory
71	V	C308	CE8512	Water and Waste Water Analysis Laboratory
72	V	C309	CE8513	Survey Camp (2 weeks –During IV Semester)
73	VI	C310	CE8601	Design of Steel Structural Elements
74	VI	C311	CE8602	Structural Analysis II
75	VI	C312	CE8603	Irrigation Engineering
76	VI	C313	CE8604	Highway Engineering
77	VI	C314	EN8592	Wastewater Engineering
78	VI	C315 (PE II-1)	CE8001	Ground Improvement Techniques
79	VI	C315 (PE II-2)	CE8002	Introduction to Soil Dynamics and Machine Foundations
80	VI	C315 (PE II-3)	CE8003	Rock Engineering
81	VI	C315 (PE II-4)	CE8004	Urban Planning and Development
82	VI	C315 (PE II-5)	CE8005	Air Pollution and Control Engineering

83	VI	C315 (PE II-6)	GE8075	Intellectual Property Rights
84	VI	C316	CE8611	Highway Engineering Laboratory
85	VI	C317	CE8612	Irrigation and Environmental Engineering Drawing
86	VI	C318	HS8581	Professional Communication
87	VII	C401	CE8701	Estimation, Costing and Valuation Engineering
88	VII	C402	CE8702	Railways, Airports, Docks and Harbour Engineering
89	VII	C403	CE8703	Structural Design and Drawing
90	VII	C405 (PE III-1)	CE8006	Pavement Engineering
91	VII	C405 (PE III-2)	CE8007	Traffic Engineering and Management
92	VII	C405 (PE III-3)	CE8008	Transport and Environment
93	VII	C405 (PE III-4)	CE8009	Industrial Structures
94	VII	C405 (PE III-5)	CE8010	Environmental and Social Impact Assessment
95	VII	C405 (PE III-6)	CE8011	Design of Prestressed Concrete Structures
96	VII	C405 (PE III-7)	CE8012	Construction Planning and Scheduling
97	VII	C405 (PE III-8)	EN8591	Municipal Solid Waste Management
98	VII	C405 (PE III-9)	GE8077	Total Quality Management
99	VII	C405 (PE III-10)	GE8072	Foundation Skills In Integrated Product Development
100	VII	C406 (OE II-1)	OCE551	Air Pollution and Control Engineering
101	VII	C406 (OE II-2)	OAT551	Automotive Systems
102	VII	C406 (OE II-3)	OIC551	Biomedical Instrumentation
103	VII	C406 (OE II-4)	OIT552	Cloud Computing
104	VII	C406 (OE II-5)	OIT551	Database Management Systems
105	VII	C406 (OE II-6)	OAI551	Environment and Agriculture
106	VII	C406 (OE II-7)	OPT551	Fibre Reinforced Plastics

107	VII	C406 (OE II-8)	OCE552	Geographic Information System
108	VII	C406 (OE II-9)	OAT552	Internal Combustion Engines
109	VII	C406 (OE II-10)	OML551	Introduction To Nanotechnology
110	VII	C406 (OE II-11)	OIM552	Lean Manufacturing
111	VII	C406 (OE II-12)	OBM552	Medical Physics
112	VII	C406 (OE II-13)	OML552	Microscopy
113	VII	C406 (OE II-14)	OAI552	Participatory Water Resources Management
114	VII	C406 (OE II-15)	OCH552	Principles of Chemical Engineering
115	VII	C406 (OE II-16)	OBT554	Principles of Food Preservation
116	VII	C406 (OE II-17)	OMF551	Product Design and Development
117	VII	C406 (OE II-18)	OAI553	Production Technology of Agricultural machinery
118	VII	C406 (OE II-19)	ORO551	Renewable Energy Sources
119	VII	C406 (OE II-20)	OAN551	Sensors and Transducers
120	VII	C406 (OE II-21)	OIC552	State Variable Analysis and Design
121	VII	C406 (OE II-22)	OTL553	Telecommunication Network Management
122	VII	C406 (OE II-23)	OIM551	World Class Manufacturing
123	VII	C407	CE8711	Creative and Innovative Project (Activity Based -Subject Related)
124	VII	C408	CE8712	Industrial Training (4 weeks During VI Semester – Summer)
125	VIII	C409 (PE IV-1)	CE8013	Coastal Engineering
126	VIII	C409 (PE IV-2)	CE8014	Participatory Water Resources Management
127	VIII	C409 (PE IV-3)	CE8015	Integrated Water Resources Management
128	VIII	C409 (PE IV-4)	CE8016	Groundwater Engineering

129	VIII	C409 (PE IV-5)	CE8017	Water Resources Systems Engineering
130	VIII	C409 (PE IV-6)	CE8018	Geo-Environmental Engineering
131	VIII	C409 (PE IV-7)	CE8091	Hydrology and Water Resources Engineering
132	VIII	C409 (PE IV-8)	GE8076	Professional Ethics in Engineering
133	VIII	C411 (PE V-1)	CE8019	Computer Aided Design of Structures
134	VIII	C411 (PE V-2)	CE8020	Maintenance Repair and rehabilitation of Structures
135	VIII	C411 (PE V-3)	CE8021	Structural Dynamics and Earthquake Engineering
136	VIII	C411 (PE V-4)	CE8022	Prefabricated Structures
137	VIII	C411 (PE V-5)	CE8023	Bridge Engineering
138	VIII	C411 (PE V-6)	GE8073	Fundamentals of Nanoscience
139	VIII	C412	CE8811	Project Work

Department of Civil Engineering
Anna University Regulations 2017
First Year Courses (I & II Semester)
Course Outcomes (COs)

C101	HS8151	COMMUNICATIVE ENGLISH

Course Outcomes (Cos)

C101.1	Students will be able to read articles of a general kind in magazines and newspapers.
C101.2	Students will be able to participate effectively in informal conversations; introduce themselves and their friends and express opinions in english.
C101.3	Students will be able to comprehend conversations and short talks delivered in english
C101.4	Students will be able to listen to dialogues and conversations and to complete exercises based on them.
C101.5	Students will be able to write short essays of a general kind and personal letters and emails in english.

C102	MA8151	ENGINEERING MATHEMATICS – I

Course Outcomes (Cos)

C102.1	Students will be able to use both the limit definition and rules of differentiation to differentiate functions and Apply differentiation to solve maxima and minima problems
C102.2	Students will be able to evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus
C102.3	Students will be able to evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts and Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.
C102.4	Students will be able to determine convergence/divergence of improper integrals and evaluate convergent improper integrals.
C102.5	Students will be able to apply various techniques in solving differential equations.

C103	PH8151	ENGINEERING PHYSICS

Course Outcomes (Cos)

C103.1	The students will gain knowledge on the basics of properties of matter and its applications,
C103.2	The students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics,
C103.3	The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers,
C103.4	The students will get knowledge on advanced physics concepts of quantum theory and its applications in tunnelling microscopes
C103.5	The students will understand the basics of crystals, their structures and different crystal growth techniques.

C104	CY8151	ENGINEERING CHEMISTRY

Course Outcomes (Cos)

C104.1	To make the students conversant with boiler feed water requirements, related problems and water treatment techniques.
C104.2	To develop an understanding of the basic concepts of phase rule and its applications to single and two component systems and appreciate the purpose and significance of alloys.
C104.3	To know the Preparation, properties and applications of engineering materials.
C104.4	To know the types of fuels, calorific value calculations, manufacture of solid, liquid and gaseous fuels.
C104.5	To apply the Principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells.

C105	GE8151	PROBLEM SOLVING AND PYTHON PROGRAMMING

Course Outcomes (Cos)

C105.1	Students will be able to develop algorithmic solutions to simple computational problems
C105.2	Students will be able to read, write, execute by hand simple python programs
C105.3	Students will be able to decompose a python program into functions
C105.4	Students will be able to represent compound data using python lists, tuples, dictionaries.
C105.5	Students will be able to read and write data from/to files in python programs.

C106	GE8152	ENGINEERING GRAPHICS

Course Outcomes (Cos)

C106.1	Students will be able to familiarize with the fundamentals and standards of engineering graphics
C106.2	Students will be able to perform freehand sketching of basic geometrical constructions and multiple views of objects.
C106.3	Students will be able to project orthographic projections of lines and plane surfaces.
C106.4	Students will be able to draw projections and solids and development of surfaces.
C106.5	Students will be able to visualize and to project isometric and perspective sections of simple solids.

C107	GE8161	PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY

Course Outcomes (Cos)

C107.1	Students will be able to write, test, and debug simple python programs.
C107.2	Students will be able to implement python programs with conditionals and loops.
C107.3	Students will be able to develop python programs step-wise by defining functions and calling them.
C107.4	Students will be able to use python lists, tuples, dictionaries for representing compound data.
C107.5	Students will be able to read and write data from/to files in python.

C108	BS8161	PHYSICS AND CHEMISTRY LABORATORY

Course Outcomes (Cos)

C108.1	Apply principles of elasticity, optics and thermal properties for engineering applications
C108.2	Analyze young's modulus, rigidity modulus, wavelength of different colors and particle size of minute particles
C108.3	Construct the circuits, assemble the apparatus, tabulate the readings and calculate the answers using appropriate formulae
C108.4	Compare and conclude the calculated values with the standard values and justify their

C109	HS8251	TECHNICAL ENGLISH

Course Outcomes (Cos)

C109.1	Students will be able to read technical texts and write area- specific texts effortlessly.
C109.2	Students will be able to listen and comprehend lectures and talks in their area of specialisation successfully.
C109.3	Students will be able to speak appropriately and effectively in varied formal and informal contexts.
C109.4	Students will be able to write reports and winning job applications.
C109.5	Students will be able to read technical texts and write area- specific texts effortlessly.

C110	MA8251	ENGINEERING MATHEMATICS – II

Course Outcomes (Cos)

C110.1	Students will be able to eigen values and eigenvectors, diagonalization of a matrix, symmetric matrices, positive definite matrices and similar matrices.
C110.2	Students will be able to gradient, divergence and curl of a vector point function and related identities.
C110.3	Students will be able to evaluation of line, surface and volume integrals using gauss, stokes and green's theorems and their verification.
C110.4	Students will be able to analytic functions, conformal mapping and complex integration.
C110.5	Students will be able to laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients

C112	BE8253	BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING

Course Outcomes (Cos)

C112.1	Students will be able to understand electric circuits.
C112.2	Students will be able to determine the regulation and efficiency of transformers.
C112.3	Students will be able to describe the construction and working principle of electrical machines
C112.4	Students will be able to understand the concepts of various electronic devices
C112.5	Students will be able to choose appropriate instruments for electrical measurement for a specific application

C113	GE8291	ENVIRONMENTAL SCIENCE AND ENGINEERING

Course Outcomes (Cos)

C113.1	Define Environment, ecosystem and biodiversity, classify types of ecosystems and outline the impacts to biodiversity.
C113.2	Define pollution, classify its types, analyze the causes and suggest control measures for Pollution.
C113.3	Outline various natural resources; explain causes and impacts of destruction of resources.
C113.4	List various social issues related to land, water and energy; summarize the concerning government acts and rules to overcome these problems.
C113.5	Interpret population explosion and variation among nations, show the impacts of over population and illustrate the methods to mitigate the same.

C114	GE8292	ENGINEERING MECHANICS

Course Outcomes (Cos)

C114.1	Students will be able to illustrate the vectorial and scalar representation of forces and moments
C114.2	Students will be able to analyse the rigid body in equilibrium
C114.3	Students will be able to evaluate the properties of surfaces and solids
C114.4	Students will be able to calculate dynamic forces exerted in rigid body
C114.5	Students will be able to determine the friction and the effects by the laws of friction

C115	GE8261	ENGINEERING PRACTICES LABORATORY

Course Outcomes (Cos)

C115.1	Students will be able to fabricate welding equipment's to join the structures and also carpentry components and pipe connections including plumbing works.
C115.2	Students will be able to carry out the basic machining operations and able to make the models using sheet metal works.
C115.3	Students will be able to illustrate on centrifugal pump, air conditioner, operations of smithy, foundary and fittings.
C115.4	Students will be able to carry out basic home electrical works and appliances and able to measure the electrical quantities.
C115.5	Students will be able to elaborate on the components, gates, soldering practices

C116	CE8211	Computer Aided Building Drawing

Course Outcomes (Cos)

C116.1	Ability to determine the speed characteristic of different building drawings
C116.2	Ability to design drawing involving section and elevations
C116.3	Ability to draw the components of buildings

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First Year Courses (III & IV Semester)
Course Outcomes (COs)

C201	MA8353	Transforms and Partial Differential Equations

Course Outcomes (Cos)

C201.1	Students will be able to understand how to solve the given standard partial differential equations.
C201.2	Students will be able to solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
C201.3	Students will be able to appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations
C201.4	Students will be able to understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.
C201.5	Students will be able to use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems

C202	CE8301	Strength of Materials I

Course Outcomes (Cos)

C202.1	Students will be able to understand the concepts of stress and strain, principal stresses and principal planes.
C202.2	Students will be able to determine Shear force and bending moment in beams and understand concept of theory ofsimple bending.
C202.3	Students will be able to calculate the deflection of beams by different methods and selection of method fordetermining slope or deflection
C202.4	Students will be able to apply basic equation of torsion in design of circular shafts and helical springs
C202.5	Students will be able to analyze the pin jointed plane and space trusses

C203	CE8302	Fluid Mechanics

Course Outcomes (Cos)

C203.1	Students will be able to get a basic knowledge of fluids in static, kinematic and dynamic equilibrium.
C203.2	Students will be able to understand and solve the problems related to equation of motion
C203.3	Students will be able to gain knowledge about dimensional and model analysis
C203.4	Students will be able to learn types of flow and losses of flow in pipes
C203.5	Students will be able to understand and solve the boundary layer problems

C204	CE8351	Surveying

Course Outcomes (Cos)

C204.1	Students will be able to the use of various surveying instruments and mapping
C204.2	Students will be able to measuring horizontal angle and vertical angle using different instruments
C204.3	Students will be able to methods of leveling and setting levels with different instruments
C204.4	Students will be able to concepts of astronomical surveying and methods to determine time, longitude, latitude andazimuth
C204.5	Students will be able to concept and principle of modern surveying

C205	CE8391	Construction Materials

Course Outcomes (Cos)

C205.1	Students will be able to compare the properties of most common and advanced building materials
C205.2	Students will be able to understand the typical and potential applications of lime, cement and aggregates
C205.3	Students will be able to know the production of concrete and also the method of placing and making of concrete elements
C205.4	Students will be able to understand the applications of timbers and other materials
C204.5	Students will be able to understand the importance of modern material for construction

C206	CE8392	Engineering Geology

Course Outcomes (Cos)

C206.1	Students will be able to will be able to understand the importance of geological knowledge such as earth,earthquake, volcanism and the action of various geological agencies
C206.2	Students will be able to will get basics knowledge on properties of minerals
C206.3	Students will be able to gain knowledge about types of rocks, their distribution and uses
C206.4	Students will be able to will understand the methods of study on geological structure
C206.5	Students will be able to will understand the application of geological investigation in projects such as dams,tunnels, bridges, roads, airport and harbor

C207	CE8311	Construction Materials Laboratory

Course Outcomes (Cos)

C207.1	Students will be able to the students will have the required knowledge in the area of testing of construction materials and components of construction elements experimentally

C208	CE8361	Surveying Laboratory

Course Outcomes (Cos)

C208.1	Students completing this course would have acquired practical knowledge on handling basic survey instruments including Theodolite, Tacheometry, Total Station and GPS and have adequate knowledge to carryout Triangulation and Astronomical surveying including general field marking for various engineering projects and Location of site etc.

C209	HS8381	Interpersonal Skills / Listening and Speaking

Course Outcomes (Cos)

C209.1	Students will be able to listen and respond appropriately
C209.2	Students will be able to participate in group discussions
C209.3	Students will be able to make effective presentations
C209.4	Students will be able to participate confidently and appropriately in conversations both formal and informal

C210	MA8491	Numerical Methods

Course Outcomes (Cos)

210.1	Students will be able to understand the basic concepts and techniques of solving algebraic and transcendentalequations
210.2	Students will be able to appreciate the numerical techniques of interpolation and error approximations in variousintervals in real life situations
210.3	Students will be able to apply the numerical techniques of differentiation and integration for engineering problems
210.4	Students will be able to understand the knowledge of various techniques and methods for solving first and secondorder ordinary differential equations
210.5	Students will be able to solve the partial and ordinary differential equations with initial and boundary conditions byusing certain techniques with engineering applications

C211	CE8401	Construction Techniques and Practices

Course Outcomes (Cos)

211.1	Students will be able to know the different construction techniques and structural systems
211.2	Students will be able to understand various techniques and practices on masonry construction, flooring, and roofing
211.3	Students will be able to plan the requirements for substructure construction
211.4	Students will be able to know the methods and techniques involved in the construction of various types of superstructures
211.5	Students will be able to select, maintain and operate hand and power tools and equipment used in the building construction sites

C212	CE8402	Strength of Materials II

Course Outcomes (Cos)

212.1	Students will be able to determine the strain energy and compute the deflection of determinate beams, frames andtrusses using energy principles
212.2	Students will be able to analyze propped cantilever, fixed beams and continuous beams using theorem of threemoment equation for external loadings and support settlements
212.3	Students will be able to find the load carrying capacity of columns and stresses induced in columns and cylinders
212.4	Students will be able to determine principal stresses and planes for an element in three dimensional state of stressand study various theories of failure
212.5	Students will be able to determine the stresses due to unsymmetrical bending of beams, locate the shear center,and find the stresses in curved beams

C213	CE8403	Applied Hydraulic Engineering

Course Outcomes (Cos)

213.1	Students will be able to apply their knowledge of fluid mechanics in addressing problems in open channels
213.2	Students will be able to able to identify a effective section for flow in different cross sections
213.3	Students will be able to to solve problems in uniform, gradually and rapidly varied flows in steady state conditions
213.4	Students will be able to understand the principles, working and application of turbines
213.5	Students will be able to understand the principles, working and application of pumps

C214	CE8404	Concrete Technology

Course Outcomes (Cos)

214.1	Students will be able to the various requirements of cement, aggregates and water for making concrete
214.2	Students will be able to the effect of admixtures on properties of concrete
214.3	Students will be able to the concept and procedure of mix design as per is method
214.4	Students will be able to the properties of concrete at fresh and hardened state
214.5	Students will be able to the importance and application of special concretes

C215	CE8491	Soil Mechanics

Course Outcomes (Cos)

215.1	Students will be able to classify the soil and assess the engineering properties, based on index properties
215.2	Students will be able to understand the stress concepts in soils
215.3	Students will be able to understand and identify the settlement in soils
215.4	Students will be able to determine the shear strength of soil
215.5	Students will be able to analyze both finite and infinite slopes

C216	CE8481	Strength of Materials Laboratory

Course Outcomes (Cos)

216.1	Students will be able to required knowledge in the area of testing of materials and components of structural elements experimentally.

C217	CE8461	Hydraulic Engineering Laboratory

Course Outcomes (Cos)

217.1	Students will be able to measure flow in pipes and determine frictional losses.
217.2	Students will be able to develop characteristics of pumps and turbines.

C218	HS8461	Advanced Reading and Writing

Course Outcomes (Cos)

218.1	Students will be able to write different types of essays
218.2	Students will be able to write winning job applications
218.3	Students will be able to read and evaluate texts critically
218.4	Students will be able to display critical thinking in various professional contexts.

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Third Year Courses (V & VI Semester)
Course Outcomes (COs)

C301	CE8501	Design of Reinforced Cement Concrete Elements

Course Outcomes (Cos)

301.1	Students will be able to understand the various design methodologies for the design of RC elements.
301.2	Students will be able to know the analysis and design of flanged beams by limit state method and sign of beams for shear, bond and torsion.
301.3	Students will be able to design the various types of slabs and staircase by limit state method.
301.4	Students will be able to design columns for axial, uniaxial and biaxial eccentric loadings.
301.5	Students will be able to design of footing by limit state method.

C302	CE8502	Structural Analysis I

Course Outcomes (Cos)

302.1	Students will be able to analyze continuous beams, pin-jointed indeterminate plane frames and rigid plane frames by strain energy method
302.2	Students will be able to analyse the continuous beams and rigid frames by slope defection method.
302.3	Students will be able to understand the concept of moment distribution and analysis of continuous beams and rigid frames with and without sway
302.4	Students will be able to analyse the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method
302.5	Students will be able to understand the concept of matrix stiffness method and analysis of continuous beams, pin jointed trusses and rigid plane frames.

C303	EN8491	Water Supply Engineering

Course Outcomes (Cos)

303.1	Students will be able to an in sight into the structure of drinking water supply systems, including water transport, treatment and distribution
303.2	Students will be able to the knowledge in various unit operations and processes in water treatment
303.3	Students will be able to an ability to design the various functional units in water treatment
303.4	Students will be able to an understanding of water quality criteria and standards, and the irrelation to public health
303.5	Students will be able to the ability to design and evaluate water supply project alternatives on basis of chosen criteria

C304	CE8591	Foundation Engineering

Course Outcomes (Cos)

304.1	Students will be able to understand the site investigation, methods and sampling.
304.2	Students will be able to get knowledge on bearing capacity and testing methods.
304.3	Students will be able to design shallow footings
304.4	Students will be able to determine the load carrying capacity, settlement of pile foundation.
304.5	Students will be able determine the earth pressure on retaining wall sand analysis for stability.

C307	CE8511	Soil Mechanics Laboratory

Course Outcomes (Cos)

307.1	Students will be able to conduct tests to determine both the index and engineering properties of soils and to characterize the soil based on their properties.

C308	CE8512	Water and Waste Water Analysis Laboratory

Course Outcomes (Cos)

308.1	Students will be able to quantify the pollutant concentration in water and wastewater
308.2	Students will be able to suggest the type of treatment required and amount of dosage required for the treatment
308.3	Students will be able to examine the conditions for the growth of micro-organisms

C310	CE8601	Design of Steel Structural Elements

Course Outcomes (Cos)

310.1	Students will be able to understand the concepts of various design philosophies
310.2	Students will be able to design common bolted and welded connections for steel structures
310.3	Students will be able to design tension members and understand the effect of shear lag.
310.4	Students will be able to understand the design concept of axially loaded columns and column base connections.
310.5	Students will be able to understand specific problems related to the design of laterally restrained and unrestrained steel beams

C311	CE8602	Structural Analysis II

Course Outcomes (Cos)

311.1	Students will be able to draw influence lines for statically determinate structures and calculate critical stress resultants.
311.2	Students will be able to understand Muller Breslau principle and draw the influence lines for statically indeterminate beams
311.3	Students will be able to analyse of three hinged, two hinged and fixed arches.
311.4	Students will be able to analyse the suspension bridges with stiffening girders
311.5	Students will be able to understand the concept of Plastic analysis and theme thodofanalyzing beams and rigid frames.

C312	CE8603	Irrigation Engineering

Course Outcomes (Cos)

312.1	Students will be able to have knowledge and skills on crop water requirements
312.2	Students will be able to understand the methods and management of irrigation
312.3	Students will be able to gain knowledge on types of Impounding structures
312.4	Students will be able to understand methods of irrigation including canal irrigation
312.5	Students will be able to get knowledge on water management on optimization of water use.

C313	CE8604	Highway Engineering

Course Outcomes (Cos)

313.1	Students will be able to get knowledge on planning and aligning of highway
313.2	Students will be able to geometric design of highways
313.3	Students will be able to design flexible and rigid pavements
313.4	Students will be able to gain knowledge on Highway construction materials, properties, testing methods
313.5	Students will be able to understand the concept of pavement management system, evaluation of distress and maintenance of pavements

C314	EN8592	Waste water Engineering

Course Outcomes (Cos)

314.1	Students will be able to to estimate sewage generation and design sewer system including sewage pumping stations An ability to estimate sewage generation and design sewer system including sewage pumping stations
314.2	Students will be able to therequiredunderstandingonthecharacteristicsandcompositionofsewage,self-purificationof streams
314.3	Students will be able to performbasicdesignoftheunitoperationsandprocessesthatareusedinsewagetreatment
314.4	Students will be able to understand the standard methods for disposal ofsewage
314.5	Students will be able to gain knowledge on sludge treatment and disposal

C316	CE8611	Highway Engineering Laboratory

Course Outcomes (Cos)

316.1	Students will be able to knows the techniques to characterize various pavement materials through relevanttests.

C317	CE8612	Irrigation and Environmental Engineering Drawing

Course Outcomes (Cos)

317.1	Students will be able to design and draw various units of Municipal water treatment plants and sewage treatment plants.

C318	HS8581	Professional Communication

Course Outcomes (Cos)

318.1	Students will be able to make effective presentations
318.2	Students will be able to participate confidently in Group Discussions
318.3	Students will be able to attend job interviews and be successful in them
318.4	Students will be able to develop adequate Soft Skills required for the workplace

C401	CE8701	Estimation, Costing and Valuation Engineering

Course Outcomes (Cos)

401.1	Students will be able to estimate the quantities forbuildings
401.2	Students will be able to rate Analysis for all Building works, canals, and Roads and Cost Estimate.
401.3	Students will be able to understand types of specifications, principles for report preparation, tender notices types.
401.4	Students will be able to gain knowledge on types of contracts
401.5	Students will be able to evaluate valuation for building and land.

C402	CE8702	Railways, Airports, Docks and Harbour Engineering

Course Outcomes (Cos)

402.1	Students will be able to understand the methods of route alignment and design elements in Railway Planning and Constructions.
402.2	Students will be able to Understand the Construction techniques and Maintenance of Track laying and Railway stations.
402.3	Students will be able to Gain an insight on the planning and site selection of Airport Planning and design.
402.4	Students will be able to Analyze and design the elements for orientation of runways and passenger facility systems.
402.5	Students will be able to Understand the various features in Harbours and Ports, their construction, coastal protection works and coastal Regulations to be adopted.

C403	CE8703	Structural Design and Drawing

Course Outcomes (Cos)

403.1	Students will be able draw reinforced concrete Cantilever and Counterfort Retaining Walls
403.2	Students will be able to design and draw flat slab as per code provisions
403.3	Students will be able to design and draw reinforced concrete and steel bridges
403.4	Students will be able to design and draw reinforced concrete and steel water tanks
403.5	Students will be able to design and detail the various steel trusses and cantry girders

C408	CE8712	Industrial Training (4 weeks During VI Semester –Summer)

Course Outcomes (Cos)

408.1	Students will be able to the intricacies of implementation textbook knowledge into practice
408.2	Students will be able to the concepts of developments and implementation of new techniques

C412	CE8811	Project Work

Course Outcomes (Cos)

412.1	Students will be able to be in a position to take up any challenging practical problems and find solution by formulating proper methodology.