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 2021
List of Course Names

S. No.	Sem	Course Code	Subject Code	Subject Name
1.	I	C101	IP3151	Induction Programme
2.	I	C102	HS3152	Professional English – I
3.	I	C103	MA3151	Matrices and Calculus
4.	I	C104	PH3151	Engineering Physics
5.	I	C105	CY3151	Engineering Chemistry
6.	I	C106	GE3151	Problem Solving and Python Programming
7.	I	C107	GE3152	தமிழர் மரபு / Heritage of Tamils
8.	I	C108	GE3171	Problem Solving and Python Programming Laboratory
9.	I	C109	BS3171	Physics and Chemistry Laboratory
10.	I	C110	GE3172	English Laboratory$
11.	II	C111	HS3251	Professional English – II
12.	II	C112	MA3251	Statistics and Numerical Methods
13.	II	C113	PH3201	Physics for Civil Engineering
14.	II	C114	BE3252	Basic Electrical, Electronics and Instrumentation Engineering
15.	II	C115	GE3251	Engineering Graphics
16.	II			NCC Credit Course Level 1#
17.	II	C116	GE3252	தமிழரும் தொழில்நுட்பமும் / Tamils and Technology
18.	II	C117	GE3271	Engineering Practices Laboratory
19.	II	C118	BE3272	Basic Electrical, Electronics and Instrumentation Engineering Laboratory
20.	II	C119	GE3272	Communication Laboratory / Foreign Language$
21.	III	C201	MA3351	Transforms and Partial Differential Equations
22.	III	C202	ME3351	Engineering Mechanics
23.	III	C203	CE3301	Fluid Mechanics
24.	III	C204	CE3302	Construction Materials and Technology
25.	III	C205	CE3303	Water Supply and Wastewater Engineering
26.	III	C206	CE3351	Surveying and Levelling

27.	III	C207	CE3361	Surveying and Levelling Laboratory
28.	III	C208	CE3311	Water and Wastewater Analysis Laboratory
29.	III	C209	GE3361	Professional Development$^\$$
30.	IV	C210	CE3401	Applied Hydraulic Engineering
31.	IV	C211	CE3402	Strength of Materials
32.	IV	C212	CE3403	Concrete Technology
33.	IV	C213	CE3404	Soil Mechanics
34.	IV	C214	CE3405	Highway and Railway Engineering
35.	IV	C215	GE3451	Environmental Sciences and Sustainability
36.				NCC Credit Course Level 2#
37.	IV	C216	CE3411	Hydraulic Engineering Laboratory
38.	IV	C217	CE3412	Materials Testing Laboratory
39.	IV	C218	CE3413	Soil Mechanics Laboratory
40.	V	C301	CE3501	Design of Reinforced Concrete Structural Elements
41.	V	C302	CE3502	Structural Analysis I
42.	V	C303	CE3503	Foundation Engineering
43.	V/VI/ VII/ VIII	C304 (PE-V1)	CE3001	Concrete Structures
44.		C305 (PE-V1)	CE3002	Steel Structures
45.		C306 (PE-V1)	CE3003	Prefabricated Structures
46.		C307 (PE-V1)	CE3004	Prestressed Concrete Structures
47.		C308 (PE-V1)	CE3005	Rehabilitation/Heritage Restoration
48.		C309 (PE-V1)	CE3006	Dynamics and Earthquake Resistant Structures
49.		C310 (PE-V1)	CE3007	Introduction to Finite Element Method
50.	V/VI/ VII/ VIII	C311 (PE-V2)	CE3008	Formwork Engineering
51.		C312 (PE-V2)	CE3009	Construction Equipment and Machinery
52.		C313 (PE-V2)	CE3010	Sustainable Construction And Lean Construction
53.		C314 (PE-V2)	CE3011	Digitalized Construction Lab
54.		C315 (PE-V2)	CE3012	Construction Management and Safety
55.		C316 (PE-V2)	CE3013	Advanced Construction Techniques
56.		C317 (PE-V2)	CE3014	Energy Efficient Buildings
57.	V/VI/ VII/ VIII	C318 (PE-V3)	CE3015	Geoenvironmental Engineering
58.		C319 (PE-V3)	CE3016	Ground Improvement Techniques
59.		C320 (PE-V3)	CE3017	Soil Dynamics and Machine Foundations
60.		C321 (PE-V3)	CE3018	Rock Mechanics
61.		C322 (PE-V3)	CE3019	Earth and Earth Retaining Structures
62.		C323 (PE-V3)	CE3020	Pile Foundation
63.		C324 (PE-V3)	CE3021	Tunneling Engineering

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64.	V/VI/ VII/ VIII	C325 (PE-V4)	GI3492	Total Station and GPS Surveying
65.		C326 (PE-V4)	CE3022	Remote Sensing Concepts
66.		C327 (PE-V4)	CE3023	Satellite Image Processing
67.		C328 (PE-V4)	GI3491	Cartography and GIS
68.		C329 (PE-V4)	GI3391	Photogrammetry
69.		C330 (PE-V4)	GI3691	Airborne and Terrestrial Laser Mapping
70.		C331 (PE-V4)	CE3024	Hydrographic Surveying
71.	V/VI/ VII/ VIII	C332 (PE-V5)	CE3025	Airports and Harbours
72.		C333 (PE-V5)	CE3026	Traffic Engineering and Management
73.		C334 (PE-V5)	CE3027	Urban Planning and Development
74.		C335 (PE-V5)	CE3028	Smart Cities
75.		C336 (PE-V5)	CE3029	Intelligent Transport Systems
76.		C337 (PE-V5)	CE3030	Pavement Engineering
77.		C338 (PE-V5)	CE3031	Transportation Planning Process
78.	V/VI/ VII/ VIII	C339 (PE-V6)	CE3032	Climate Change Adaptation and Mitigation
79.		C340 (PE-V6)	CCE331	Air and Noise Pollution Control Engineering
80.		C341 (PE-V6)	CCE333	Environmental Impact Assessment
81.		C342 (PE-V6)	CCE334	Industrial Wastewater Management
82.		C343 (PE-V6)	CE3033	Solid and Hazardous Waste Management
83.		C344 (PE-V6)	CE3034	Environmental Policy and Legislations
84.		C345 (PE-V6)	CCE332	Environment, Health and Safety
85.	V/VI/ VII/ VIII	C346 (PE-V7)	CE3035	Participatory Water Resources Management
86.		C347 (PE-V7)	CE3036	Ground Water Engineering
87.		C348 (PE-V7)	CE3037	Water Resources Systems Engineering
88.		C349 (PE-V7)	CE3038	Watershed Conservation and Management
89.		C350 (PE-V7)	CE3039	Integrated Water Resources Management
90.		C351 (PE-V7)	CE3040	Urban Water Infrastructure
91.		C352 (PE-V7)	CE3041	Water Quality and Management
92.	V/VI/ VII/ VIII	C353 (PE-V8)	CE3042	Ocean Wave Dynamics
93.		C354 (PE-V8)	CE3043	Marine Geotechnical Engineering
94.		C355 (PE-V8)	CE3044	Coastal Engineering
95.		C356 (PE-V8)	CE3045	Offshore Structures
96.		C357 (PE-V8)	CE3046	Portand Harbour Engineering
97.		C358 (PE-V8)	CE3047	Coastal Hazards and Mitigation
98.		C359 (PE-V8)	CE3048	Coastal Zone Management and Remote Sensing
99.	V/VI/ VII/ VIII	C360 (PE-V9)	CE3049	Steel Concrete Composite Structures
100.		C361 (PE-V9)	CE3050	Finance for Engineers
101.		C362 (PE-V9)	CE3051	Earth and Rockfill Dams
102.		C363 (PE-V9)	CE3052	Computational Fluid Dynamics
103.		C364 (PE-V9)	CE3053	Rainwater Harvesting

104.		C365 (PE-V9)	CE3054	Transport and Environment
105.		C366 (PE-V9)	CE3055	Environmental Quality Monitoring
106.	VI	C367	CE3601	Design of Steel Structural Elements
107.	VI	C368	CE3602	Structural Analysis II
108.	VI	C369	AG3601	Engineering Geology
109.	VI	C370 (OE I & II – 1)	OCS351	Artificial Intelligence and Machine Learning Fundamentals
110.	VI	C371 (OE I & II – 2)	OCS352	IoT Concepts and Applications
111.	VI	C372 (OE I & II – 3)	OCS353	Data Science Fundamentals
112.	VI	C373 (OE I & II – 4)	OCS354	Augmented and Virtual Reality
113.	VI	C374 (MC II – 1)	MX3085	Well Being with Traditional Practices (Yoga, A yurveda and Siddha)
114.	VI	C375 (MC II – 2)	MX3086	History of Science and Technology in India
115.	VI	C376 (MC II – 3)	MX3087	Political and Economic Thought for a Humane Society
116.	VI	C377 (MC II – 4)	MX3088	State, Nation Building and Politics in India
117.	VI	C378 (MC II – 5)	MX3089	Industrial Safety
118.	VI	C379	CE3611	Building Drawing and Detailing Laboratory
119.	VII	C402	CE3701	Estimation, Costing and Valuation Engineering
120.	VII	C403	CE3702	Hydrology and Irrigation Engineering
121.	VII	C404	GE3791	Human Values and Ethics
122.	VII	C405	GE3752	Total Quality Management
123.	VII	C406 (OE III – 1)	OHS351	English for Competitive Examinations
124.	VII	C407 (OE III – 2)	OMG352	NGOs and Sustainable Development
125.	VII	C408 (OE III – 3)	OMG353	Democracy and Good Governance
126.	VII	C409 (OE III – 4)	OME353	Renewable Energy Technologies
127.	VII	C410 (OE III – 5)	OME354	Applied Design Thinking
128.	VII	C411 (OE III – 6)	OMF351	Reverse Engineering
129.	VII	C412 (OE III – 7)	OMF353	Sustainable Manufacturing
130.	VII	C413 (OE III – 8)	OAU351	Electric and HybridVehicle
131.	VII	C414 (OE III – 9)	OAS352	Space Engineering
132.	VII	C415 (OE III – 10)	OIM351	Industrial Management
133.	VII	C416 (OE III – 11)	OIE354	Quality Engineering
134.	VII	C417 (OE III – 12)	OSF351	Fire Safety Engineering
135.	VII	C418 (OE III – 13)	OML351	Introduction to non- destructive testing
136.	VII	C419 (OE III – 14)	OMR351	Mechatronics
137.	VII	C420 (OE III – 15)	ORA351	Foundation of Robotics
138.	VII	C421 (OE III – 16)	OAE352	Fundamentals of Aeronautical engineering
139.	VII	C422 (OE III – 17)	OGI351	Remote Sensing Concepts
140.	VII	C423 (OE III – 18)	OAI351	Urban Agriculture
141.	VII	C424 (OE III – 19)	OEN351	Drinking Water Supply and Treatment

142.	VII	C425 (OE III – 20)	OEE352	Electric Vehicle technology
143.	VII	C426 (OE III – 21)	OEI353	Introduction to PLC Programming
144.	VII	C427 (OE III – 22)	OCH351	Nano Technology
145.	VII	C428 (OE III – 23)	OCH352	Functional Materials
146.	VII	C429 (OE III – 24)	OBT352	Biomedical Instrumentation
147.	VII	C430 (OE III – 25)	OFD352	Traditional Indian Foods
148.	VII	C431 (OE III – 26)	OFD353	Introduction to food processing
149.	VII	C432 (OE III – 27)	OPY352	IPR for Pharma Industry
150.	VII	C433 (OE III – 28)	OTT351	Basics of Textile Finishing
151.	VII	C434 (OE III – 29)	OTT352	Industrial Engineering for Garment Industry
152.	VII	C435 (OE III – 30)	OTT353	Basics of Textile Manufacture
153.	VII	C436 (OE III – 31)	OPE351	Introduction to Petroleum Refining and Petrochemicals
154.	VII	C437 (OE III – 32)	OPE352	Energy Conservation and Management
155.	VII	C438 (OE III – 33)	OPT351	Basics of Plastics Processing
156.	VII	C439 (OE III – 34)	OEC351	Signals and Systems
157.	VII	C440 (OE III – 35)	OEC352	Fundamentals of Electronic Devices and Circuits
158.	VII	C441 (OE III – 36)	OBM351	Foundation Skills in integrated product Development
159.	VII	C442 (OE III – 37)	OBM352	Assistive Technology
160.	VII	C443 (OE III – 38)	OMA352	Operations Research
161.	VII	C444 (OE III – 39)	OMA353	Algebra and Number Theory
162.	VII	C445 (OE III – 40)	OMA354	Linear Algebra
163.	VII	C446 (OE IV – 01)	OHS352	Project Report Writing
164.	VII	C447 (OE IV – 02)	OMA355	Advanced Numerical Methods
165.	VII	C448 (OE IV – 03)	OMA356	Random Processes
166.	VII	C449 (OE IV – 04)	OMA357	Queuing and Reliability Modelling
167.	VII	C450 (OE IV – 05)	OMG354	Production and Operations Management for Entrepreneurs
168.	VII	C451 (OE IV – 06)	OMG355	Multivariate Data Analysis
169.	VII	C452 (OE IV – 07)	OME352	Additive Manufacturing
170.	VII	C453 (OE IV – 08)	OME353	New Product Development
171.	VII	C454 (OE IV – 09)	OME355	Industrial Design & Rapid Prototyping Techniques
172.	VII	C455 (OE IV – 10)	OMF352	Micro and Precision Engineering
173.	VII	C456 (OE IV – 11)	OMF354	Cost Management of Engineering Projects
174.	VII	C457 (OE IV – 12)	OAU352	Batteries and Management system
175.	VII	C458 (OE IV – 13)	OAU353	Sensors and Actuators
176.	VII	C459 (OE IV – 14)	OAS353	Space Vehicles
177.	VII	C460 (OE IV – 15)	OIM352	Management Science
178.	VII	C461 (OE IV – 16)	OIM353	Production Planning and Control
179.	VII	C462 (OE IV – 17)	OIE353	Operations Management

180.	VII	C463 (OE IV – 18)	OSF352	Industrial Hygiene
181.	VII	C464 (OE IV – 19)	OSF353	Chemical Process Safety
182.	VII	C465 (OE IV – 20)	OML352	Electrical, Electronic and Magnetic materials
183.	VII	C466 (OE IV – 21)	OML353	Nano materials and applications
184.	VII	C467 (OE IV – 22)	OMR352	Hydraulics and Pneumatics
185.	VII	C468 (OE IV – 23)	OMR353	Sensors
186.	VII	C469 (OE IV – 24)	ORA352	Foundation of Automation
187.	VII	C470 (OE IV – 25)	ORA353	Concepts in Mobile Robotics
188.	VII	C471 (OE IV – 26)	OMV351	Marine Propulsion
189.	VII	C472 (OE IV – 27)	OMV352	Marine Merchant Vehicles
190.	VII	C473 (OE IV – 28)	OMV353	Elements of Marine Engineering
191.	VII	C474 (OE IV – 29)	OAE353	Drone Technologies
192.	VII	C475 (OE IV – 30)	OGI352	Geographical Information System
193.	VII	C476 (OE IV – 31)	OAI352	Agriculture Entrepreneurship Development
194.	VII	C477 (OE IV – 32)	OEN352	Biodiversity Conservation
195.	VII	C478 (OE IV – 33)	OEE353	Introduction to control systems
196.	VII	C479 (OE IV – 34)	OEI354	Introduction to Industrial Automation Systems
197.	VII	C480 (OE IV – 35)	OCH353	Energy Technology
198.	VII	C481 (OE IV – 36)	OCH354	Surface Science
199.	VII	C482 (OE IV – 37)	OBT353	Environment and Agriculture
200.	VII	C483 (OE IV – 38)	OFD354	Fundamentals of Food Engineering
201.	VII	C484 (OE IV – 39)	OFD355	Food safety and Quality Regulations
202.	VII	C485 (OE IV – 40)	OPY353	Nutraceuticals
203.	VII	C486 (OE IV – 41)	OTT354	Basics of Dyeing and Printing
204.	VII	C487 (OE IV – 42)	OTT355	Fibre Science
205.	VII	C488 (OE IV – 43)	OTT356	Garment Manufacturing Technology
206.	VII	C489 (OE IV – 44)	OPE353	Industrial safety
207.	VII	C490 (OE IV – 45)	OPE354	Unit Operations in Petro Chemical Industries
208.	VII	C491 (OE IV – 46)	OPT352	Plastic Materials for Engineers
209.	VII	C492 (OE IV – 47)	OPT353	Properties and Testing of Plastics
210.	VII	C493 (OE IV – 48)	OEC353	VLSI Design
211.	VII	C494 (OE IV – 49)	OEC354	Industrial IoT and Industry 4.0
212.	VII	C495 (OE IV – 50)	OBM353	Wearable devices
213.	VII	C496 (OE IV – 51)	OBM354	Medical Informatics
214.	VIII	C497	CE3811	Project Work / Internship

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Department of Civil Engineering
Anna University Regulations 2021
First Year Courses (I & II Semester)
Course Outcomes (COs)

C102	HS3152	Professional English – I

Course Outcomes (Cos)

C102.1	To use appropriate words in a professional context
C102.2	To gain understanding of basic grammatical structures and use them in right context
C102.3	To read and infer the denotative and connotative meanings of technical texts
C102.4	To read and interpret information presented in tables, charts and other graphic forms
C102.5	To write definitions, descriptions, narrations and essays on various topics

C103	MA3151	Matrices and Calculus

Course Outcomes (Cos)

C103.1	Use the matrix algebra methods for solving practical problems
C103.2	Apply differential calculus tools in solving various application problems
C103.3	Able to use differential calculus ideas on several variable functions.
C103.4	Apply different methods of integration in solving practical problems.
C103.5	Apply multiple integral ideas in solving areas, volumes and other practical problems

C104	PH3151	Engineering Physics

Course Outcomes (Cos)

C104.1	Understand the importance of mechanics
C104.2	Express their knowledge in electromagnetic waves.
C104.3	Demonstrate a strong foundational knowledge in oscillations, optics and lasers
C104.4	Understand the importance of quantum physics
C104.5	Comprehend and apply quantum mechanical principles towards the formation of energy bands

C105	CY3151	Engineering Chemistry

Course Outcomes (Cos)

C105.1	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.
C105.2	To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.
C105.3	To apply the knowledge of phase rule and composites for material selection requirements
C105.4	To recommend suitable fuels for engineering processes and applications
C105.5	To recognize different forms of energy resources and apply them for suitable applications in energy sectors.

C106	GE3151	Problem Solving and Python Programming

Course Outcomes (Cos)

C106.1	Develop algorithmic solutions to simple computational problems.
C106.2	Develop and execute simple Python programs.
C106.3	Write simple Python programs using conditionals and looping for solving problems
C106.4	Decompose a Python program into functions
C106.5	Represent compound data using Python lists, tuples, dictionaries and write data from/to files in Python programs.

C108	GE3171	Problem Solving and Python Programming Laboratory

Course Outcomes (Cos)

C108.1	Develop algorithmic solutions to simple computational problems
C108.2	Develop and execute simple Python programs
C108.3	Implement programs in Python using conditionals and loops for solving problems.
C108.4	Deploy functions to decompose a Python program.
C108.5	Process compound data using Python data structures and utilize python packages.

C109	BS3171	Physics and Chemistry Laboratory

Course Outcomes (Cos)

C109.1	Understand the functioning of various physics laboratory equipment.
C109.2	Use graphical models to analyze laboratory data.
C109.3	Use mathematical models as a medium for quantitative reasoning and describing physical reality
C109.4	Access, process and analyze scientific information
C109.5	Solve problems individually and collaboratively

C110	GE3172	English Laboratory

Course Outcomes (Cos)

C110.1	To listen to and comprehend general as well as complex academic information
C110.2	To listen to and understand different points of view in a discussion
C110.3	To speak fluently and accurately in formal and informal communicative contexts
C110.4	To describe products and processes and explain their uses and purposes clearly and accurately
C110.5	To express their opinions effectively in both formal and informal discussions

C111	HS3251	Professional English – II

Course Outcomes (Cos)

C111.1	To compare and contrast products and ideas in technical texts
C111.2	To identify and report cause and effects in events, industrial processes through technical texts
C111.3	To analyse problems in order to arrive at feasible solutions and communicate them in the written format
C111.4	To present their ideas and opinions in a planned and logical manner
C111.5	To draft effective resumes in the context of job search.

C112	MA3251	Statistics and Numerical Methods

Course Outcomes (Cos)

C112.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C112.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture
C112.3	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
C112.4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
C112.5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications

C113	PH3201	Physics for Civil Engineering

Course Outcomes (Cos)

C113.1	Acquire knowledge about heat transfer through different materials, thermal performance of building and thermal insulation.
C113.2	Gain knowledge on the ventilation and air conditioning of buildings
C113.3	Understand the concepts of sound absorption, noise insulation and lighting designs
C113.4	Now about the processing and applications of composites, metallic glasses, shape memory alloys and ceramics
C113.5	Get an awareness on natural disasters such as earth quake, cyclone, fire and safety measures

C114	BE3252	Basic Electrical, Electronics and Instrumentation Engineering

Course Outcomes (Cos)

C114.1	Compute the electric circuit parameters for simple problems
C114.2	Explain the concepts of domestics wiring and protective devices
C114.3	Explain the working principle and applications of electrical machines
C114.4	Analyze the characteristics of analog electronic devices
C114.5	Explain the types and operating principles of sensors and transducers

C115	GE3251	Engineering Graphics

Course Outcomes (Cos)

C115.1	Use BIS conventions and specifications for engineering drawing.
C115.2	Construct the conic curves, involutes and cycloid
C115.3	Solve practical problems involving projection of lines.
C115.4	Draw the orthographic, isometric and perspective projections of simple solids
C115.5	Draw the development of simple solids

C117	GE3271	Engineering Practices Laboratory

Course Outcomes (Cos)

C117.1	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.
C117.2	Wire various electrical joints in common household electrical wire work.
C117.3	Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work
C117.4	Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.

C118	BE3272	Basic Electrical, Electronics and Instrumentation Engineering Laboratory

Course Outcomes (Cos)

C118.1	Use experimental methods to verify the Ohm's law and Kirchhoff's Law and to measure three phase power
C118.2	Analyze experimentally the load characteristics of electrical machines
C118.3	Analyze the characteristics of basic electronic devices
C118.4	Use LVDT to measure displacement

C119	GE3272	Communication Laboratory

Course Outcomes (Cos)

C119.1	Speak effectively in group discussions held in a formal/semi formal contexts
C119.2	Discuss, analyse and present concepts and problems from various perspectives to arrive at suitable solutions
C119.3	Write emails, letters and effective job applications.
C119.4	Write critical reports to convey data and information with clarity and precision
C119.5	Give appropriate instructions and recommendations for safe execution of tasks

Department of Civil Engineering
Anna University Regulations 2021
First Year Courses (III & IV Semester)
Course Outcomes (COs)

C201	MA3351	Transforms and Partial Differential Equations

Course Outcomes (Cos)

C201.1	Understand how to solve the given standard partial differential equations.
C201.2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
C201.3	Appreciate the physical significance of Fourier series techniques in solving one and two dimensional heat flow problems and one dimensional wave equations.
C201.4	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	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.

C202	ME3351	Engineering Mechanics

Course Outcomes (Cos)

C202.1	Illustrate the vectorial and scalar representation of forces and moments
C202.2	Analyse the rigid body in equilibrium
C202.3	Evaluate the properties of distributed forces
C202.4	Determine the friction and the effects by the laws of friction
C202.5	Calculate dynamic forces exerted in rigid body

C203	CE3301	Fluid Mechanics

Course Outcomes (Cos)

C203.1	Demonstrate the difference between solid and fluid, its properties and behaviour in static conditions
C203.2	Apply the conservation laws applicable to fluids and its application through fluid kinematics and dynamics
C203.3	Formulate the relationship among the parameters involved in the given fluid phenomenon and to predict the performance of prototypes by model studies.
C203.4	Estimate the losses in pipelines for both laminar and turbulent conditions and analysis of pipes connected in series and parallel.
C203.5	Explain the concept of boundary layer and its application to find the drag force excreted by the fluid on the flat solid surface

C204	CE3302	Construction Materials and Technology

Course Outcomes (Cos)

C204.1	Identify the good quality brick, stone and blocks for construction
C204.2	Recognize the market forms of timber, steel, aluminum and applications of various composite materials
C204.3	Identify the best construction and service practices such as thermal insulations and air conditioning of the building
C204.4	Select various equipments for construction works conditioning of building
C204.5	Understand the construction planning and scheduling techniques

C205	CE3303	Water Supply and Wastewater Engineering

Course Outcomes (Cos)

C205.1	Understand the various components of water supply scheme and design of intake structure and conveyance system for water transmission
C205.2	Understand on the characteristics and composition of sewage, ability to estimate sewage generation and design sewer system including sewage pumping stations
C205.3	Understand the process of conventional treatment and design of water and wastewater treatment system and gain knowledge of selection of treatment process and biological treatment process
C205.4	Ability to design and evaluate water distribution system and water supply in buildings and understand the self-purification of streams and sludge and septage disposal methods
C205.5	Able to understand and design the various advanced treatment system and knowledge about the recent advances in water and wastewater treatment process and reuse of sewage

C206	CE3351	Surveying and Levelling

Course Outcomes (Cos)

C206.1	Introduce the rudiments of various surveying and its principles
C206.2	Imparts knowledge in computation of levels of terrain and ground features
C206.3	Imparts concepts of Theodolite Surveying for complex surveying operations
C206.4	Understand the procedure for establishing horizontal and vertical contro
C206.5	Imparts the knowledge on modern surveying instruments

C207	CE3361	Surveying and Levelling Laboratory

Course Outcomes (Cos)

C207.1	Impart knowledge on the usage of basic surveying instruments like chain/tape, compass and levelling instruments
C207.2	Able to use levelling instrument for surveying operations
C207.3	Able to use theodolite for various surveying operations
C207.4	Able to carry out necessary surveys for social infrastructures
C207.5	Able to prepare planimetric maps

C208	**CE3311**	**Water and Wastewater Analysis Laboratory**

Course Outcomes (Cos)

C208.1	Calibrate and standardize the equipment
C208.2	Collect proper sample for analysis
C208.3	To know the sample preservation methods
C208.4	To perform field oriented testing of water, wastewater
C208.5	To perform coliform analysis

C209	**GE3361**	**Professional Development$**

Course Outcomes (Cos)

C209.1	Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements
C209.2	Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding
C209.3	Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects.

C210	**CE3401**	**Applied Hydraulic Engineering**

Course Outcomes (Cos)

C210.1	Describe the basics of open channel flow, its classification and analysis of uniform flow in steady state conditions with specific energy concept and its application
C210.2	Analyse steady gradually varied flow, water surface profiles and its length calculation using direct and standard step methods with change in water surface profiles due to change in grades
C210.3	Derive the relationship among the sequent depths of steady rapidly varied flow and estimating energy loss in hydraulic jump with exposure to positive and negative surges.
C210.4	Design turbines and explain the working principl
C210.5	Differentiate pumps and explain the working principle with characteristic curves and design centrifugal and reciprocating pumps

C211	CE3402	Strength of Materials

Course Outcomes (Cos)

C211.1	Understand the concepts of stress and strain, principal stresses and principal planes.
C211.2	Determine Shear force and bending moment in beams and understand concept of theory of simple bending
C211.3	Calculate the deflection of beams by different methods and selection of method for determining slope or deflection.
C211.4	Analyze propped cantilever, fixed beams and continuous beams for external loadings and support settlements
C211.5	Determine the stresses due to Unsymmetrical bending of beams, locate the shear center, and study the various theories of failure

C212	CE3403	Concrete Technology

Course Outcomes (Cos)

C212.1	Understand the requirements of cement, aggregates and water for concrete
C212.2	Select suitable admixtures for enhancing the properties of concrete
C212.3	Design concrete mixes as per IS method of mix design
C212.4	Determine the properties of concrete at fresh and hardened state
C212.5	Know the importance of special concretes for specific requirements.

C213	CE3404	Soil Mechanics

Course Outcomes (Cos)

C213.1	Demonstrate an ability to identify various types of soils and its properties, formulate and solve engineering Problems
C213.2	Show the basic understanding of flow through soil medium and its impact of engineering solution
C213.3	Understand the basic concept of stress distribution in loaded soil medium and soil settlement due to consolidation
C213.4	Show the understanding of shear strength of soils and its impact of engineering solutions to the loaded soil medium and also will be aware of contemporary issues on shear strength of soils
C213.5	Demonstrate an ability to design both finite and infinite slopes, component and process as per needs and specifications.

C214	CE3405	Highway and Railway Engineering

Course Outcomes (Cos)

C214.1	Plan a highway according to the principles and standards adopted in various institutions in India.
C214.2	Design the geometric features of road network and components of pavement.
C214.3	Test the highway materials and construction practice methods and know its properties and able to perform pavement evaluation and management.
C214.4	Understand the methods of route alignment and design elements in railway planning and constructions.
C214.5	Understand the construction techniques and maintenance of track laying and railway stations.

C216	CE3411	Hydraulic Engineering Laboratory

Course Outcomes (Cos)

C216.1	Apply Bernoulli equation for calibration of flow measuring devices
C216.2	Measure friction factor in pipes and compare with Moody diagram
C216.3	Determine the performance characteristics of rotodynamic pumps
C216.4	Determine the performance characteristics of positive displacement pumps.
C216.5	Determine the performance characteristics of turbines.

C217	CE3412	Materials Testing Laboratory

Course Outcomes (Cos)

C217.1	Determine the mechanical properties of steel.
C217.2	Determine the physical properties of cement
C217.3	Determine the physical properties of fine and coarse aggregate
C217.4	Determine the workability and compressive strength of concrete
C217.5	Determine the strength of brick and wood.

C218	CE3413	Soil Mechanics Laboratory

Course Outcomes (Cos)

C218.1	Conduct tests to determine the index properties of soils
C218.2	Determine the insitu density and compaction characteristics
C218.3	Conduct tests to determine the compressibility, permeability and shear strength of soils.
C218.4	Understand the various tests on Geosynthetics

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C301	CE3501	Design of Reinforced Concrete Structural Elements

Course Outcomes (Cos)

C301.1	Know the various design concepts and design RC rectangular beams by working stress and limit state methods
C301.2	Understand the design of flanged beams, design for shear and torsion, and anchorage and development length.
C301.3	Design a RC slabs and staircase and draw the reinforcement detailing.
C301.4	Design short columns for axial, uni-axial and bi-axial eccentric loadings
C301.5	Design wall footings, isolated footings and combined rectangular footing

C302	CE3502	Structural Analysis I

Course Outcomes (Cos)

C302.1	Analyze the pin-jointed plane and space frames
C302.2	Analyse the continuous beams and rigid frames by slope defection method.
C302.3	Understand the concept of moment distribution and analysis of continuous beams and rigid frames with and without sway.
C302.4	Analyse the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method.
C302.5	Understand the concept of matrix stiffness method and analysis of continuous beams, pin jointed trusses and rigid plane frames.

C303	CE3503	Foundation Engineering

Course Outcomes (Cos)

C303.1	Graduate will demonstrate an ability to plan and execute a detailed site investigation to select geotechnical design parameters and type of foundation
C303.2	Graduate will demonstrate an ability to design shallow foundations, its component or process as per the needs and specifications.
C303.3	Graduate will demonstrate an ability to design combined footings and raft foundations, its component or process as per the needs and specifications.
C303.4	Graduate will demonstrate an ability to design deep foundations, its component or process as per the needs and specifications.
C303.5	Graduate will demonstrate an ability to design retaining walls, its component or process as per the needs and specifications.

C312 (PE-V2)	CE3009	Construction Equipment and Machinery

Course Outcomes (Cos)

C312.1	Develop knowledge on planning of equipment and selection of equipment

C312.2	Explain the knowledge on fundamentals of earth work operations, earth moving operations and types of earth work equipment
C312.3	Develop the knowledge on special construction equipment
C312.4	Apply the knowledge on asphalt and concrete plants
C312.5	Apply the knowledge and select the proper materials handling equipment

C325 (PE-V4)	GI3492	Total Station and GPS Surveying

Course Outcomes (Cos)

C325.1	Learn about the fundamental concept of Total station
C325.2	Provide knowledge about electromagnetic waves and its usage in Total station and GNSS.
C325.3	Gain Knowledge on basic concepts of GNSS
C325.4	Understand the measuring and working principle of electro optical and Microwave Total station and GPS
C325.5	Gain knowledge about Total station and GNSS data processing and Mapping.

C342 (PE-V6)	CCE334	Industrial Wastewater Management

Course Outcomes (Cos)

C342.1	Explain the source and types of industrial wastewater and their environmental impacts and choose the regulatory laws pertaining to environmental protection.
C342.2	Identify industrial wastewater pollution and implement pollution prevention, waste minimization in industries.
C342.3	Apply knowledge and skills to design industrial wastewater treatment schemes.
C342.4	Audit and analyze environmental performance of industries to internal, external client, regulatory bodies and design water reuse management techniques.
C342.5	Conduct research to develop effective management systems for industrial wastewater that are technically sound, economically feasible and socially acceptable.

C367	CE3601	Design of Steel Structural Elements

Course Outcomes (Cos)

C367.1	Recognize the design philosophy of steel structures and identify the different failure modes of bolted and welded connections, and determine their design strengths
C367.2	Select the most suitable section shape and size for tension and compression members and beams according to specific design criteria
C367.3	Apply the principles, procedures and current code requirements to the analysis and design of steel tension members, columns, column bases and beams
C367.4	Identify and compute the design loads on Industrial structures, and gantry girder
C367.5	Find out ultimate load of steel beams and portal frames using plastic analysis

C368	CE3602	Structural Analysis II

Course Outcomes (Cos)

C368.1	Draw influence lines for statically determinate structures and calculate critical stress resultants.
C368.2	Understand Muller Breslau principle and draw the influence lines for statically indeterminate beams.
C368.3	Analyse three hinged, two hinged and fixed arches.
C368.4	Analyse the suspension bridges with stiffening girders
C368.5	Analyse HYD rigid frames by approximate methods for gravity and horizontal loads

C369	AG3601	Engineering Geology

Course Outcomes (Cos)

C369.1	Knowing the internal structure of earth and its relation to earthquakes. Landforms created by various geological agents and their importance in civil engineering
C369.2	Getting knowledge on various minerals and rocks that can be used as construction materials and road aggregates. In addition, testing the suitability of rocks for foundation purposes.
C369.3	Studying various geological structures and their impact in engineering constructions. Further, learning the geomechanical properties of rocks and their significance in engineering projects.
C369.4	Gaining knowledge on the role of geological mapping, remote sensing and geophysics for surface and subsurface investigations. In addition, students will also gain knowledge on borehole logging techniques and their applications in civil engineering.
C369.5	Applying geological knowledge for designing and constructing major civil engineering structures, and also mitigating various geological hazards such as earthquakes, landslides and tsunamis.

C379	CE3611	Building Drawing and Detailing Laboratory

Course Outcomes (Cos)

C379.1	Draft the plan, elevation and sectional view of the load bearing and framed buildings
C379.2	Draw the structural detailing of RCC elements
C379.3	Draw the structural detailing of RCC water tanks, footings and retaining walls
C379.4	Draw the structural detailing of steel structures
C379.5	Draft the structural detailing of Industrial structures

C402	CE3701	Estimation, Costing and Valuation Engineering

Course Outcomes (Cos)

C402.1	Gain knowledge on types of contracts
C402.2	Understand types of specifications, principles for report preparation, tender notices types.
C402.3	Rate Analysis for all Building works, canals, and Roads and Cost Estimate.
C402.4	Estimate the quantities for buildings.
C402.5	Evaluate valuation for building and land

C403	CE3702	Hydrology and Irrigation Engineering

Course Outcomes (Cos)

C403.1	Define the hydrological processes and their integrated behaviour in catchments
C403.2	Apply the knowledge of hydrological processes to address basin characteristics, runoff and hydrograph
C403.3	Explain the concept of hydrological extremes and its management strategies
C403.4	Describe the principles of storage reservoirs
C403.5	Understand and apply the concepts of groundwater management

C404	GE3791	Human Values and Ethics

Course Outcomes (Cos)

C404.1	Identify the importance of democratic, secular and scientific values in harmonious functioning of social life
C404.2	Practice democratic and scientific values in both their personal and professional life
C404.3	Find rational solutions to social problems
C404.4	Behave in an ethical manner in society
C404.5	Practice critical thinking and the pursuit of truth

C405	GE3752	Total Quality Management

Course Outcomes (Cos)

C405.1	Ability to apply TQM concepts in a selected enterprise.
C405.2	Ability to apply TQM principles in a selected enterprise.
C405.3	Ability to understand Six Sigma and apply Traditional tools, New tools, Benchmarking and FMEA.
C405.4	Ability to understand Taguchi's Quality Loss Function, Performance Measures and apply QFD, TPM, COQ and BPR
C405.5	Ability to apply QMS and EMS in any organization.

C497	CE3811	Project Work / Internship

Course Outcomes (Cos)

C497.1	Identify civil engineering problems reviewing available literature
C497.2	Identify appropriate techniques to analyze complex civil engineering problems
C497.3	Apply engineering and management principles through efficient handling of Project have a clear idea of his/her area of work and they are in a position to carry out the work in a systematic way.

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