SRI RANGANATHAR
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai)
Accredited by NAAC with "A+" Grade & ISO 9001:2015 Certified Institution
Athipalayam, Coimbatore - 641 110. Web site: sriet.ac.in Ph: 0422 2697792

DEPARTMENT OF CIVIL ENGINEERING

COURSE OUTCOME

REGULATION 2013

BATCH:2016-2020

Department of Civil Engineering

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Department Civil Engineering

Vision

To develop competent professionals for the Civil Engineering sector which provides Enviro – Economic friendly opportunities.

Mission

- To kindle the enterprising spirit in the mind of students enabling them to become future entrepreneurs through field level exposures and business cases.
- To facilitate students to research on Green Projects for saving Time, Resource & Energy.
- To encourage independent and lifelong learning in the broadest context of technology advancement.
- To educate students on professional ethics and customer – focused approach. Works.

Program Educational Objectives

Students who graduate from this program will be able

PEO1 : To prepare students for successful careers in Civil Engineering field that meets the needs of Indian and multinational companies
PEO2: To develop the confidence and ability among students to synthesize data and technical concepts and thereby apply it in real world problems
PEO3: To develop students to use modern techniques, skill and mathematical engineering tools for solving problems in Civil Engineering
PEO4: To provide students with a sound foundation in mathematical, scientific and engineering fundamentals necessary to formulate, solve and analyse engineering problems and to prepare them for graduate studies.
PEO5: To promote students to work collaboratively on multi-disciplinary projects and make them engage in life-long learning process throughout their professional life.

Program Outcomes

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design / development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:** Use research-based knowledge and

research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to ones own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

Program Specific Outcomes

At the end of the program students will be able to

- Identify, examine and solve problems in the domains of Civil Engineering that needs analytical and design requirements.
- Plan, analyze, design and prepare estimate for Civil Engineering projects with professional ethics.

Department of Civil Engineering

Course Code & Title:

As per Anna University Regulation 2013, the list of courses is given in the Table.

S/N	COURSE CODE	COURSE CODE (UNIVERSITY)	TITLE OF THE COURSE
Semester 01			
1.	C101	HS6151	Technical English I
2.	C102	MA6151	Mathematics I
3.	C103	PH6151	Engineering Physics I
4.	C104	CY6151	Engineering Chemistry I
5.	C105	GE6151	Computer Programming
6.	C106	GE6152	Engineering Graphics
7.	C107	GE6161	Computer Practices Laboratory
8.	C108	GE6162	Engineering Practices Laboratory I
9.	C109	GE6163	Physics and Chemistry Laboratory - I
Semester 02			
10.	C110	HS6251	Technical English II
11.	C111	MA6251	Mathematics II
12.	C112	PH6201	Engineering Physics II
13.	C113	CY6251	Engineering Chemistry II
14.	C114	GE6252	Basic Electrical and Electronics Engineering
15.	C115	GE6253	Engineering Mechanics
16.	C116	GE6262	Physics and Chemistry Laboratory - II
17.	C117	GE6261	Computed Aided Drafting and Modelling Laboratory
Semester 03			
18.	C201	MA6351	Transforms and Partial Differential Equation
19.	C202	GE6351	Environmental Science and Engineering
20.	C203	CE6301	Engineering Geology

21.	C204	CE6302	Mechanics of Solids
22.	C205	CE6303	Mechanics of Fluids
23.	C206	CE6304	Surveying I
24.	C207	CE6311	Survey Practical I
25.	C208	CE6312	Computer Aided Building Drawing
Semester 04			
26.	C209	MA6459	Numerical methods
27.	C210	CE6401	Construction Materials
28.	C211	CE6402	Strength of Materials
29.	C212	CE6403	Applied Hydraulic Engineering
30.	C213	CE6404	Surveying II
31.	C214	CE6405	Soil Mechanics
32.	C215	CE6411	Strength of Materials Laboratory
33.	C216	CE6412	Hydraulic Engineering Laboratory
34.	C217	CE6413	Survey Practical II
Semester 05			
35.	C301	CE6501	Structural Analysis I
36.	C302	CE6502	Foundation Engineering
37.	C303	CE6503	Environmental Engineering I
38.	C304	CE6504	Highway Engineering
39.	C305	CE6505	Design of Reinforced Cement Concrete Elements
40.	C306	CE6506	Construction Techniques, Equipment and Practices
41.	C307	GE6674	Communication and Soft Skills Based Laboratory
42.	C308	CE6511	Soil Mechanics Laboratory
43.	C309	CE6512	Survey Camp
Semester 06			
44.	C310	CE6601	Design of Reinforced Concrete & Brick

45.	C311	CE6602	Structural Analysis II
46.	C312	CE6603	Design of Steel Structures
47.	C313	CE6604	Railways Airports and Harbor Engineering
48.	C314	CE6605	Environmental Engineering II
49.	C315	CE6002	Concrete Technology
50.	C316	CE6611	Environmental Engineering Laboratory
51.	C317	CE6612	Concrete and Highway Laboratory
Semester 07			
52.	C401	CE6701	Structural Dynamics and Earthquake Engineering
53.	C402	CE6702	Prestressed Concrete Structures
54.	C403	CE6703	Water Resources and Irrigation Engineering
55.	C404	CE6704	Estimation and Quantity Surveying
56.	C405	CE6007	Housing Planning and Management
57.	C406	EN6501	Municipal Solid Waste Management
58.	C407	CE6711	Computer Aided Design and Drafting Laboratory
59.	C408	CE6712	Design Project
Semester 08			
60.	C409	MG6851	Principles of Management
61.	C410	CE6016	Prefabricated Structures
62.	C411	CE6021	Repair and Rehabilitation of Structures
63.	C412	CE6811	Project Work

Department of Civil Engineering

Course Outcome

Regulation 2013

SEMESTER 01		
1. Course Code and Name: HS6151 - TECHNICAL ENGLISH I		
CO Statements		**Knowledge Level**
Students will be able to		
C101.1	Explain clearly, confidently, comprehensibly, and communicate with one or many listeners using appropriate communicative strategies.	K2
C101.2	Construct cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic.	K6
C101.3	Organize different genres of texts adopting various reading strategies.	K6
C101.4	Distinguish and comprehend different spoken discourses/excerpts in different accents.	K2
C101.5	Listen to different accents, speeches and presentations.	K2
2. Course Code and Name: MA6151 - MATHEMATICS I		
CO Statements		**Knowledge Level**
Students will be able to		
C102.1	Learn a clear idea of matrix algebra pertaining eigen values and eigen vectors in addition dealing with quadratic forms.	K2
C102.2	Learn infinite series and their convergence and acquire the knowledge of with limitations of using infinite series approximations for solutions arising in mathematical modelling.	K2
C102.3	Understand and characterize phenomena which evolve around circle of curvature and envelope.	K2
C102.4	Extend the function of a one variable to several variables. Multivariable functions of real variables arise inevitable in engineering.	K2
C102.5	Exposed to double and triple integration so that they can handle integrals of higher order which are applied in engineering field.	K3

3. Course Code and Name: PH6151 - ENGINEERING PHYSICS I		
CO Statements		**Knowledge Level**
Students will be able to		
C103.1	Classify the Bravais lattices, and different types of crystal structures & growth techniques.	K1
C103.2	Demonstrate the properties of elasticity and heat transfer of objects.	K2
C103.3	Explain Black body Radiation and properties of matter waves and Schrodinger wave equations.	K3
C103.4	Illustrate the acoustic requirements, production and application of ultrasonic.	K1
C103.5	Examine the characteristics of laser and optical fiber.	K2

4. Course Code and Name: CY6151 - ENGINEERING CHEMISTRY I		
CO Statements		**Knowledge Level**
Students will be able to		
C104.1	Classify the polymers and their utility in the industries and describe the techniques of polymerization and properties of polymers.	K1
C104.2	Relate various thermodynamic functions such as enthalpy, entropy, free energy and their importance and equilibrium constants and its significance.	K2
C104.3	Explain the photophysical processes such as fluorescence and phosphorescence and various components of UV and IR spectrophotometer.	K1
C104.4	Illustrate the phase transitions of one component and two component systems and the types of alloys and their applications in industries.	K3
C104.5	Outline the synthesis, characteristics and the applications of nano materials.	K1

5. Course Code and Name: GE6151- COMPUTER PROGRAMMING		
CO Statements		**Knowledge Level**
Students will be able to		
C105.1	Elaborate the organization of digital computer and design the solution for simple computing problems using algorithm, flowchart and pseudo code.	K6
C105.2	Apply the different looping structure to solve simple scientific and statistical problems.	K3

C105.3	Devise the solutions for simple problems using arrays and strings	K6
C105.4	Demonstrate the usage of dynamic memory allocation and pointer variables.	K3
C105.5	Illustrate the concepts of structure and union with an example programs.	K4

6. Course Code and Name: GE6152- ENGINEERING GRAPHICS

CO Statements		Knowledge Level
Students will be able to		
C106.1	Sketch the conic sections, special curves, and draw orthographic views from pictorial views and models.	K4
C106.2	Apply the principles of orthographic projections of points in all quadrants, lines and planes in first quadrant.	K3
C106.3	Sketch the projections of simple solids like prisms, pyramids, cylinder and cone and obtain the traces of plane figures.	K4
C106.4	Practice the sectional views of solids like cube, prisms, pyramids, cylinders & cones and extend its lateral surfaces	K3
C106.5	Sketch the perspective projection of simple solids, truncated prisms, pyramids, cone and cylinders and sketch the isometric projection of simple machine parts.	K4

7. Course Code and Name: GE6161- COMPUTER PRACTICES LABORATORY

CO Statements		Knowledge Level
Students will be able to		
C107.1	Describe the usage of office automation tools	K1
C107.2	Apply the good programming methods for program development.	K3
C107.3	Design and implement the C program for simple application	K4
C107.4	Develop and implement the recursive programs	K4
C107.5	Implement the C program with the help of Structures and Union	K5

8. Course Code and Name: GE6162 - ENGINEERING PRACTICES LABORATORY I		
CO Statements		**Knowledge Level**
Students will be able to		
C108.1	Construct Electrical and Electronic circuits.	K6
C108.2	Examine different types of electronic circuits and components.	K3
C108.3	Recognize electrical safety rules, grounding, general house wiring.	K6
C108.4	Explore soldering practices.	K3

9. Course Code and Name: GE6163 - PHYSICS AND CHEMISTRY LABORATORY - I		
CO Statements		**Knowledge Level**
Students will be able to		
C109.1	Apply physics principles of optics and thermal physics to evaluate engineering properties of materials.	K3
C109.2	Perform the quantitative chemical analysis of chloride and dissolved oxygen.	K5
C109.3	Determine the amount of acids by using the instruments of conductivity meter and pH meter.	K5

SEMESTER 02

1. Course Code and Name: HS6251 - TECHNICAL ENGLISH II		
CO Statements		**Knowledge Level**
Students will be able to		
C110.1	Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, argue using appropriate communicative strategies..	K2
C110.2	Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.	K5
C110.3	Read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentation.	K1
C110.4	Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.	K2

C110.5	Read and write effectively for a variety of professional and social settings	K2
2. Course Code and Name: MA6251 - MATHEMATICS II		
CO Statements		**Knowledge Level**
Students will be able to		
C111.1	Solve ordinary differential equations that model most of the engineering problems .	K3
C111.2	Acquainted with the concepts of vector calculus-like Gradient, Divergence, Curl, Directional derivative, Irrotational vector and Solenoidal vector. The course gives an understanding of Vector integration, needed for problems in all engineering disciplines.	K2
C111.3	Make to appreciate the purpose of using transforms to create new domain in which it is easier to handle the problem that is being investigated.	K6
C111.4	Develop an understanding of the standard techniques of complex variable and mapping so as to enable the student to apply them with confidence, in application areas such as heat conduction, elasticity, fluid dynamics and flow of electric current .	K4
C111.5	Exposed to the concept of Cauchy's integral theorem, Taylor and Laurent expansions, Singular points, Application of residue theorem to evaluate complex integrals.	K3
3. Course Code and Name: PH6251 - ENGINEERING PHYSICS II		
CO Statements		**Knowledge Level**
Students will be able to		
C112.1	Illustrate Classical and Quantum free electron theory& calculate carrier concentration in metals.	K2
C112.2	Describe the carrier concentration in semiconductors and identify the P-type & N-type semiconductor using Hall Effect.	K2
C112.3	Classify the different types of magnetic and superconducting materials	K2
C112.4	Explain the dielectrics, types of polarization, losses and breakdowns	K2
C112.5	Discuss the properties, preparation and applications of Metallic Alloys, SMA, Nanomaterials, NLO, and Biomaterials.	K2

4. Course Code and Name: CY6251 - ENGINEERING CHEMISTRY II		
CO Statements		**Knowledge Level**
Students will be able to		
C113.1	Summarize the water related problems in boilers and their treatment techniques.	K1
C113.2	Design the electro chemical cells and to identify the types of corrosion and the methods of prevention	K2
C113.3	Illustrate the methods of harnessing energy from non-conventional energy sources.	K2
C113.4	Classify various engineering materials and their important.	K1
C113.5	Relate the significance of solid, liquid and gaseous fuel and to calculate the calorific values of fuels and the requirement of air for combustion in furnaces.	K3.

5. Course Code and Name: GE6252 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING		
CO Statements		**Knowledge Level**
Students will be able to		
C114.1	Understand the electrical circuit and their working principles	K2
C114.2	Identify the electrical components of a machines and their applications	K2
C114.3	Explain the characteristics of the electrical machines	K2
C114.4	Identify the digital electronics circuits and their components	K2
C114.5	Explain the fundamentals of communication systems	K2

6. Course Code and Name: GE6253 - ENGINEERING MECHANICS		
CO Statements		**Knowledge Level**
Students will be able to		
C115.1	Iilustrate the vectorial and scalar representation of forces and moments	K2
C115.2	Analyse the rigid body in equilibrium	K3

C115.3	Evaluate the properties of surfaces and solids	K4
C115.4	Calculate dynamic forces exerted in rigid body	K3
C115.5	Determine the friction and the effects by the laws of friction	K3
7. Course Code and Name: GE6262 - PHYSICS AND CHEMISTRY LABORATORY - II		
CO Statements		**Knowledge Level**
Students will be able to		
C116.1	Ability to test materials by using their knowledge of applied physics principles in optics and properties of matter.	K5
C116.2	Determine the hardness, alkalinity and metal ion content in the water samples by volumetric titration.	K5
C116.3	Estimate the water quality parameters by potentiometer, conductometer and flame photometer.	K2
8. Course Code and Name: GE6261 - COMPUTED AIDED DRAFTING AND MODELLING LABORATORY		
CO Statements		**Knowledge Level**
Students will be able to		
C117.1	Use the software packers for drafting and modeling	K3
C117.2	Draw the plan of residential building and simple steel structures with the different types of joints as per the design calculations.	K3
C117.3	Create 2D and 3D models of Engineering Components	K5
SEMESTER 03		
1. Course Code and Name: MA6351 - TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATION		
CO Statements		**Knowledge Level**
Students will be able to		
C201.1	Solve Linear Partial differential equations of first and second order.	K3
C201.2	Associate the concepts of Fourier series expansion for even and odd functions.	K2
C201.3	Apply the concepts of Fourier series in solving boundary value problems.	K3

C201.4	Discuss the Fourier transform, Fourier Sine and Cosine transform techniques.	K2
C201.5	Discuss the concepts of Z-Transform techniques for discrete time systems.	K2
2. Course Code and Name: GE 6351-ENVIRONMENTAL SCIENCE AND ENGINEERING		
CO Statements		**Knowledge Level**
Students will be able to		
C202.1	Understand Public awareness of environmental is at infant stage.	K2
C202.2	Understant Ignorance and incomplete knowledge has lead to misconceptions	K2
C202.3	Development and improvement in std. of living has lead to serious environmental disasters	K2
C202.4	Understand environmental laws and regulations to develop guidelines, procedures and process for health and safety issues.	K2
C202.5	Gain Knowledge about the importance of women , child welfare and HIV /AIDS.	K2
3. Course Code and Name: CE6301 - ENGINEERING GEOLOGY		
CO Statements		**Knowledge Level**
Students will be able to		
C203.1	Understand the importance of geological knowledge such as earth, earthquake, volcanism and the action of various geological agencies.	K2
C203.2	Get basics knowledge on properties of minerals.	K2
C203.3	Gain knowledge about types of rocks, their distribution and uses.	K2
C203.4	Understand the methods of study on geological structure.	K2
C203.5	Understand the application of geological investigation in projects such as dams, tunnels, bridges, roads, airport and harbor	K2
4. Course Code and Name: CE6302 - MECHANICS OF SOLIDS		
CO Statements		**Knowledge Level**
Students will be able to		
C204.1	Understand the concepts of stress and strain, principal stresses and principal planes.	K2

C204.2	Determine Shear force and bending moment in beams and understand concept of theory of simple bending.	K4
C204.3	Calculate the deflection of beams by different methods and selection of method for determining slope or deflection.	K4
C204.4	Apply basic equation of torsion in design of circular shafts and helical springs.	K3
C204.5	Analyze the pin jointed plane and space trusses	K4

5. Course Code and Name: CE6303- MECHANICS OF FLUIDS

CO Statements		Knowledge Level
Students will be able to		
C205.1	Understand the properties of fluids , fluid statics.	K2
C205.2	Solve to problems related to fluid kinematics and dynamics	K3
C205.3	Learn types of flow and losses of flow in pipes.	K2
C205.4	Understand and solve the boundary layer problems.	K3
C205.5	Gain knowledge about dimensional and model analysis.	K3

6. Course Code and Name: CE6304 - SURVEYING I

CO Statements		Knowledge Level
Students will be able to		
C206.1	To know the various surveying instrumenmts and its types	K2
C206.2	Understand the concept of prismatic compass and suveryor compass and its working principle	K2
C206.3	Understand the basics of levelling instruments	K2
C206.4	Solve the levelling problems	K3
C206.5	Able to solve the problems in theodolite surveying	K3

7. Course Code and Name: CE6311- SURVEY PRACTICAL I		
CO Statements		**Knowledge Level**
Students will be able to		
C207.1	Apply the practical knowledge on handling basic survey instruments .	K3
C207.2	Apply the practical knowledge on handling leveling instruments.	K3
C207.3	Apply the practical knowledge on development of contour map of given area.	K3

8. Course Code and Name: CE6312 - COMPUTER AIDED BUILDING DRAWING		
CO Statements		**Knowledge Level**
Students will be able to		
C208.1	Draft the plan, elevation and sectional views of the buildings, industrial structures, framed buildings using computer softwares.	K3
C208.2	Draft the plan, elevation and sectional views of the industrial structures using computer softwares	K3
C208.3	Draft the plan, elevation and sectional views of the framed buildings using computer softwares	K3

SEMESTER 04

1. Course Code and Name: MA6459- NUMERICAL METHODS		
CO Statements		**Knowledge Level**
Students will be able to		
C209.1	Determine the solution of algebraic and transcendental system of linear equations.	K2
C209.2	To interpolate the values of unknown functions using Newton's formulas.	K2
C209.3	Estimate the numerical values of derivatives and integrals of unknown functions.	K2
C209.4	Solve first and second order initial value problems.	K2
C209.5	Solve Numerically boundary value problem.	K3

2. Course Code and Name: CE6401- CONSTRUCTION MATERIALS		
CO Statements		**Knowledge Level**
Students will be able to		
C210.1	Compare the properties of most common and advanced building materials.	K2
C210.2	Understand the typical and potential applications of lime, cement and aggregates	K2
C210.3	Know the production of concrete and also the method of placing and making of concrete elements.	K2
C210.4	Understand the applications of timbers and other materials	K2
C210.5	Understand the importance of modern material for construction.	K2
3. Course Code and Name: CE6402 STRENGTH OF MATERIALS		
CO Statements		**Knowledge Level**
Students will be able to		
C211.1	Determine the strain energy and compute the deflection of determinate beams, frames and trusses using energy principles.	K3
C211.2	Analyze propped cantilever, fixed beams and continuous beams using theorem of three moment equation for external loadings and support settlements.	K3
C211.3	Find the load carrying capacity of columns and stresses induced in columns and cylinders	K3
C211.4	Determine principal stresses and planes for an element in three dimensional state of stress and study various theories of failure	K3
C211.5	Determine the stresses due to unsymmetrical bending of beams, locate the shear center, and find the stresses in curved beams.	K3
4. Course Code and Name: CE6403 APPLIED HYDRAULIC ENGINEERING		
CO Statements		**Knowledge Level**
Students will be able to		
C212.1	Apply their knowledge of fluid mechanics in addressing problems in open channels.	K3
C212.2	Identify a effective section for flow in different cross sections.	K3

C212.3	Solve problems in uniform, gradually and rapidly varied flows in steady state conditions.	K3
C212.4	Understand the principles, working and application of turbines.	K3
C212.5	Understand the principles, working and application of pumps.	K3

5. Course Code and Name: CE6404 SURVEYING II

CO Statements		Knowledge Level
Students will be able to		
C213.1	Understaning the concsep[t of triangulation surveying and its methods	K2
C213.2	Solve the problems in theodolite surveying	K3
C213.3	Understand the concept of basics of total statio surveyinginstrument	K2
C213.4	Understand various GPS surveying methods and processing techniques used in GPS	K2
C213.5	Understand the Concepts of astronomical surveying and methods to determine time, longitude, latitude and azimuth.	K3

6. Course Code and Name: CE6405 SOIL MECHANICS

CO Statements		Knowledge Level
Students will be able to		
C214.1	Classify the soil and assess the engineering properties, based on index properties.	K2
C214.2	Understand the stress concepts in soils	K2
C214.3	Understand and identify the settlement in soils.	K3
C214.4	Determine the shear strength of soil	K3
C214.5	Analyze both finite and infinite slopes	K4

7. Course Code and Name: CE6411 STRENGTH OF MATERIALS LABORATORY		
CO Statements		**Knowledge Level**
Students will be able to		
C215.1	Analyze the various stresses on mild steel rod by conducting tension and torsion tests	K4
C215.2	Identify deflection test of metals and carriage springs	K3
C215.3	Test for compression strength of wood and helical springs	K4
C215.4	Compare hardness and impact strength of different metals	K4

8. Course Code and Name: CE6412 HYDRAULIC ENGINEERING LABORATORY		
CO Statements		**Knowledge Level**
Students will be able to		
C216.1	Identify the flow in pipes	K3
C216.2	Examine the frictional losses in pipes	K4
C216.3	Develop characteristics of pumps	K3
C216.4	Develop characteristics of turbines	K3

9. Course Code and Name: CE6413 SURVEY PRACTICAL II		
CO Statements		**Knowledge Level**
Students will be able to		
C217.1	Demonstrate the handling of theodolite	K2
C217.2	Illustrate the handling of tacheometer	K2
C217.3	Plan the general field marking for various engineering projects	K3
C217.4	Experiment with setting of curves	K3
C217.5	Make use of triangulation and astronomical surveying	K3

SEMESTER 05		
1. Course Code and Name: CE6501 STRUCTURAL ANALYSIS I		
CO Statements		**Knowledge Level**
Students will be able to		
C301.1	Determine the reaction forces and deflection for the beams and frames.	K3
C301.2	Determine the shear force and bending moment of beams by influence line method.	K3
C301.3	Analyse of three hinged, two hinged and fixed arches.	K3
C301.4	Analyse the continuous beams by slope defection method.	K3
C301.5	Analyse the rigid frames by slope defection method.	K3
2. Course Code and Name: CE6502 FOUNDATION ENGINEERING		
CO Statements		**Knowledge Level**
Students will be able to		
C302.1	Understand the site investigation, methods and sampling.	K2
C302.2	Get knowledge on bearing capacity and testing methods.	K3
C302.3	Design shallow footings.	K3
C302.4	Determine the load carrying capacity, settlement of pile foundation.	K3
C302.5	Determine the earth pressure on retaining walls and analysis for stability.	K3
3. Course Code and Name: CE6503 ENVIRONMENTAL ENGINEERING I		
CO Statements		**Knowledge Level**
Students will be able to		
C303.1	Explain the sources and characteristics of water.	K2
C303.2	Select the various types of water conveyance systems	K3

C303.3	Explain the principle of water treatment plants.	K2
C303.4	Interpret the principles involved in advanced water treatment systems.	K2
C303.5	Plan and design water distribution system supply to buildings	K3

4. Course Code and Name: CE6504 HIGHWAY ENGINEERING

CO Statements		Knowledge Level
Students will be able to		
C304.1	Get knowledge on planning and aligning of highway.	K2
C304.2	Geometric design of highways	K3
C304.3	Design flexible and rigid pavements.	K3
C304.4	Gain knowledge on Highway construction materials, properties, testing methods	K2
C304.5	Understand the concept of pavement management system, evaluation of distress and maintenance of pavements.	K2

5. Course Code and Name: CE6505 DESIGN OF REINFORCED CONCRETE ELEMENT

CO Statements		Knowledge Level
Students will be able to		
C305.1	Understand the various design methodologies for the design of RC elements.	K3
C305.2	Know the analysis and design of flanged beams by limit state method and sign of beams for shear, bond and torsion.	K4
C305.3	Design the various types of slabs and staircase by limit state method.	K4
C305.4	Design columns for axial, uniaxial and biaxial eccentric loadings.	K4
C305.5	Design of footing by limit state method.	K4

6. Course Code and Name: CE6506 CONSTRUCTION TECHNIQUES, EQUIPMENT AND PRACTICES		
CO Statements		**Knowledge Level**
Students will be able to		
C306.1	Explain the different construction techniques and structural systems	K2
C306.2	Understand various techniques and practices on masonry construction, flooring, and roofing.	K2
C306.3	Plan the requirements for substructure construction.	K3
C306.4	Choose the methods and techniques requireed for the construction of various types of super structures	K3
C306.5	Select, maintain and operate hand and power tools and equipment used in the building construction sites	K3
7. Course Code and Name: GE6674- COMMUNICATION AND SOFT SKILLS BASED LABORATORY		
CO Statements		**Knowledge Level**
Students will be able to		
C307.1	Apply appropriate communications skills across setting purpose and audiences	K2
C307.2	Demonstrate Knowledge of communication theory and applications	K6
C307.3	Organize different genres of texts adopting various reading strategies.	K6
C307.4	Distinguish and comprehend different spoken discourses/excerpts in different accents.	K2
C307.5	Listen to different accents, speeches and presentations.	K2
8. Course Code and Name: CE6511 SOIL MECHANICS LAB		
CO Statements		**Knowledge Level**
Students will be able to		
C308.1	Conduct tests to determine both the index and engineering properties of soils	K4
C308.2	Interpreting the shear strength of all types of soils by conducting lab tests	K4
C308.3	Conduct tests to determine characterize the soil based on their properties.	K4

9. Course Code and Name: CE6512 SURVEY CAMP		
CO Statements		**Knowledge Level**
Students will be able to		
C309.1	Applying the concepts of surveying	K3
C309.2	Applying the practical experience of the realities in the field of Surveying	K3
C309.3	Applying the concepts complexities involved in the field of Surveying	K3
SEMESTER 06		
1. Course Code and Name: CE6601 DESIGN OF REINFORCED CONCRETE & BRICK		
CO Statements		**Knowledge Level**
Students will be able to		
C310.1	Analyse and design the cantilever and counterfort retaining wall	K4
C310.2	Analyse and design the rectangular and circular water tank	K4
C310.3	Analyse and design the staircase, flat slab,box culvert and road bridges	K4
C310.4	Apply and design the various types of slabs by using yield line method	K3
C310.5	Design the solid wall and cavity wall	K3
2. Course Code and Name: CE6602 STRUCTURAL ANALYSIS II		
CO Statements		**Knowledge Level**
Students will be able to		
C311.1	Analyse the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method.	K3
C311.2	Understand the concept of matrix stiffness method and analysis of continuous beams, pin jointed trusses and rigid plane frames.	K3
C311.3	Apply the basic knowledge of Finite Element method in the beams, truss and triangular elements	K4
C311.4	Anderstand the concept of Plastic analysis and the method of analyzing beams and rigid frames.	K4

C311.5	Analyse the suspension bridges with stiffening girders	K3
3. Course Code and Name: CE6603 DESIGN OF STEEL STRUCTURES		
CO Statements		**Knowledge Level**
Students will be able to		
C312.1	Understand the concepts of various design philosophies	K2
C312.2	Design common bolted and welded connections for steel structures	K3
C312.3	Design tension members and understand the effect of shear lag.	K3
C312.4	Understand the design concept of axially loaded columns and column base connections.	K3
C312.5	Understand specific problems related to the design of laterally restrained and unrestrained steel beams	K3
4. Course Code and Name: CE6604 RAILWAYS AIRPORTS AND HARBOUR ENGINEERING		
CO Statements		**Knowledge Level**
Students will be able to		
C313.1	Understand the methods of route alignment and design elements in Railway Planning and Constructions.	K2
C313.2	Understand the Construction techniques and Maintenance of Track laying and Railway stations.	K2
C313.3	Gain an insight on the planning and site selection of Airport Planning and design.	K3
C313.4	Analyze and design the elements for orientation of runways and passenger facility systems.	K3
C313.5	Understand the various features in Harbours and Ports, their construction, coastal protection works and coastal Regulations to be adopted.	K2
5. Course Code and Name: CE6605 -ENVIRONMENTAL ENGINEERING II		
CO Statements		**Knowledge Level**
Students will be able to		
C314.1	Estimate sewage generation and design sewer system including sewage pumping stations	K3

C314.2	Understanding on the characteristics and composition of sewage, self-purification of streams	K3
C314.3	Perform basic design of the unit operations and processes that are used in sewage treatment	K3
C314.4	Understand the standard methods for disposal of sewage.	K2
C314.5	Gain knowledge on sludge treatment and disposal.	K2
6. Course Code and Name: CE6002 -CONCRETE TECHNOLOGY		
CO Statements		**Knowledge Level**
Students will be able to		
C315.1	Understand The various requirements of cement, aggregates and water for making concrete	K2
C315.2	Understand The effect of admixtures on properties of concrete	K2
C315.3	Understand The concept and procedure of mix design as per IS method	K2
C315.4	Understand The properties of concrete at fresh and hardened state	K2
C315.5	Understand The importance and application of special concretes.	K2
7. Course Code and Name: CE6611 ENVIRONMENTAL ENGINEERING LABORATORY		
CO Statements		**Knowledge Level**
Students will be able to		
C316.1	Quantify the pollutant concentration in water and wastewater	K3
C316.2	Suggest the type of treatment required and amount of dosage required for the treatment	K3
C316.3	Examine the conditions for the growth of micro-organisms	K4
8. Course Code and Name: CE6612 CONCRETE AND HIGHWAY LABORATORY		
CO Statements		**Knowledge Level**
Students will be able to		
C317.1	Determine fresh properties of concrete	K4

C317.2	Examine hardened properties of concrete	K4
C317.3	Test the specimens for determining of various properties of aggregates	K4
C317.4	Identify various properties of bitumen	K3

SEMESTER 07

1. Course Code and Name: CE6701 STRUCTURAL DYNAMICS AND EARTHQUAKE ENGINEERING

CO Statements		Knowledge Level
Students will be able to		
C401.1	Develop knowledge in the simulation and mathematical model development.	K3
C401.2	Trained to identify, formulate and solve complicated problem.	K3
C401.3	Understand the role of natural calamity in the damage of structures.	K3
C401.4	Develop the skill to analyse data and to apply the same in the practical problems.	K2
C401.5	Apply the developed methodologies for the safe and stable design of structures	K3

2. Course Code and Name: CE6702 PRESTRESSED CONCRETE STRUCTURES

CO Statements		Knowledge Level
Students will be able to		
C402.1	Understand the behaviour of prestressed concrete members and able to analyze the prestressed concrete beams.	K3
C402.2	Design the prestressed concrete members for flexure and shear as per the relevant design code (IS 1343).	K4
C402.3	Analyze for deflection of prestressed concrete members and design the anchorage zone.	K4
C402.4	Analyze and design of composite beams and continuous beams.	K4
C402.5	Design of prestressed concrete structures - Tanks, pipes and poles.	K4

3. Course Code and Name: CE6703 WATER RESOURCES AND IRRIGATION ENGINEERING		
CO Statements		**Knowledge Level**
Students will be able to		
C403.1	Develop the knowledge on reservoir planning and fixation of storage capacity of reservoir	K3
C403.2	Choose the economical method of water resource planning and irrigation	K3
C403.3	Explain about the concepts of irrigation	K2
C403.4	Interpret different types of impounding structures and canals	K2
C403.5	Compare different irrigation methods	K2

4. Course Code and Name: CE6704 ESTIMATION AND QUANTITY SURVEYING		
CO Statements		**Knowledge Level**
Students will be able to		
C404.1	Understand the Estimate the quantities for buildings,	K3
C404.2	Understand the Rate Analysis for all Building works, canals, and Roads and Cost Estimate.	K3
C404.3	Understand the types of specifications, tender notices types.	K2
C404.4	Evaluate the valuation for building and land.	K3
C404.5	Understand the principles of report preparation	K2

5. Course Code and Name: CE6007 HOUSING PLANNING AND MANAGEMENT		
CO Statements		**Knowledge Level**
Students will be able to		
C405.1	Understand various types of housing at state and national level	K2
C405.2	Identify the needs for sites and services	K2
C405.3	Underestand the design of urban development projects	K2

C405.4	Underestand the various construction techniques and cost effective materials.	K2
C405.5	Develop appraisal report for the housing projects.	K2

6. Course Code and Name: EN6501 MUNICIPAL SOLID WASTE MANAGEMENT		
CO Statements		**Knowledge Level**
Students will be able to		
C406.1	Understanding of the nature and characteristics of municipal solid wastes and the regulatory requirements regarding municipal solid waste management.	K2
C406.2	Reduction, reuse and recycling of waste.	K2
C406.3	Plan and design systems for storage, collection, transport, processing and disposal of municipal solid waste.	K2
C406.4	Gain knowledge on the issues on solid waste management from an integrated and holistic perspective, as well as in the local and international context.	K2
C406.5	Design and operation of sanitary landfill.	K2

7. Course Code and Name: CE6711 COMPUTER AIDED DESIGN AND DRAFTING LABORATORY		
CO Statements		**Knowledge Level**
Students will be able to		
C407.1	Design and draw reinforced concrete cantilever and counterfort Retaining Walls	K4
C407.2	Design and draw solid slab and Tee Beam bridges	K4
C407.3	Design and draw circular and rectangular water tanks	K4
C407.4	Design and draw plate girder and truss girder bridges	K4

8. Course Code and Name: CE6712DESIGN PROJECT		
CO Statements		**Knowledge Level**
Students will be able to		
C408.1	Design problems related to Civil Engineering while designing the structures.	K4

C408.2	Design problems related to industrial and residential structures	K4
C408.3	Solve various design problems related to commercial structures.	K3

SEMESTER 08

1. Course Code and Name: MG6851 PRINCIPLES OF MANAGEMENT

CO Statements		Knowledge Level
Students will be able to		
C409.1	Understand the management functions and organizations	K2
C409.2	Understand the management functions of planning	K2
C409.3	Understand the management functions of organizing	K2
C409.4	Explain the management functions of controlling	K2
C409.5	Explain the management functions of directing	K2

2. Course Code and Name: CE6016 PREFEABRICATED STRUCTURES

CO Statements		Knowledge Level
Students will be able to		
C410.1	Summarize the principles, manufacturing, production methods, and erection of prefabrication.	K2
C410.2	Illustrate the panel systems, slabs, connections used in precast construction.	K2
C410.3	Explain the design principles of prefabrication.	K2
C410.4	Outline the joints and connections used in prefabricated construction.	K2
C410.5	Explain the concept of progressive collapse and design for abnormal loads.	K2

3. Course Code and Name: CE6021 REPAIR AND REHABILITATION OF STRUCTURES		
CO Statements		**Knowledge Level**
Students will be able to		
C411.1	Know the importance of maintenance and assessment method of distressed structures.	K2
C411.2	Understand the strength and durability properties ,their effects due to climate and temperature.	K2
C411.3	Study the recent development in concrete	K2
C411.4	Learn the techniques for repair rand protection methods	K2
C411.5	Repair, rehabilitation and retrofitting of structures and demolition methods.	K2
4. Course Code and Name: CE6811 PROJECT WORK		
CO Statements		**Knowledge Level**
Students will be able to		
C412.1	Analyse any challenging practical problems related to civil engineering	K4
C412.2	Solve the problem from its identification and through literature reviews	K4
C412.3	Prepare project reports, presentations and to face interviews.	K3
C412.4	Develop different solution by formulating proper methodology	K5