

# ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY

## DEPARTMENT OF CIVIL ENGINEERING

### B.E Civil Engineering

Anna University Regulation 2013

#### List of Course Names

S.No.	Sem	Course code	Course	Course Title
1.	I	13C101	HS 6151	Technical English – I
2.	I	13C102	MA6151	Mathematics – I
3.	I	13C103	PH 6151	Engineering Physics–I
4.	I	13C104	CY6151	Engineering Chemistry-I
5.	I	13C105	GE6151	Computer Programming
6.	I	13C106	GE 6152	Engineering Graphics
7.	I	13C107	GE6161	Computer Practices Laboratory
8.	I	13C108	GE6162	Engineering Practices Laboratory
9.	I	13C109	GE6163	Physics And Chemistry Laboratory - I
10.	II	13C110	HS6251	Technical English-II
11.	II	13C111	MA6251	Mathematics – II
12.	II	13C112	PH6251	Engineering Physics – II
13.	II	13C113	CY6251	Engineering Chemistry – II
14.	II	13C114	GE6252	Basic Electrical And Electronics Engineering
15.	II	13C115	GE6253	Engineering Mechanics
16.	II	13C116	GE6261	Computer Aided Drafting And Modeling Laboratory
17.	II	13C117	GE6262	Physics And Chemistry Laboratory - II

18.	III	13C201	MA6351	Transforms And Partial Differential Equations
19.	III	13C202	GE6351	Environmental Science And Engineering
20.	III	13C203	CE6301	Engineering Geology
21.	III	13C204	CE6302	Mechanics Of Solids
22.	III	13C205	CE6303	Mechanics Of Fluids
23.	III	13C206	CE6304	Surveying I
24.	III	13C207	CE6311	Survey Practical I
25.	III	13C208	CE6312	Computer Aided Building Drawing
26.	IV	13C209	MA6459	Numerical Methods
27.	IV	13C210	CE6401	Construction Materials
28.	IV	13C211	CE6402	Strength Of Materials
29.	IV	13C212	CE6403	Applied Hydraulic Engineering
30.	IV	13C213	CE6404	Surveying II
31.	IV	13C214	CE6405	Soil Mechanics
32.	IV	13C215	CE6411	Strength Of Materials Laboratory
33.	IV	13C216	CE6412	Hydraulic Engineering Laboratory
34.	IV	13C217	CE6413	Survey Practical II
35.	V	13C301	CE6501	Structural Analysis I
36.	V	13C302	CE6502	Foundation Engineering
37.	V	13C303	CE6503	Environmental Engineering I
38.	V	13C304	CE6504	Highway Engineering
39.	V	13C305	CE6505	Design Of Reinforced Concrete Elements
40.	V	13C306	CE6506	Construction Techniques, Equipment And Practice

41.	V	13C307	GE6674	Communication And Soft Skills-Laboratory Based
42.	V	13C308	CE6511	Soil Mechanics Laboratory
43.	V	13C309	CE6512	Survey Camp*
44.	VI	13C310	CE6601	Design Of Reinforced Concrete & Brick Masonry Structures
45.	VI	13C311	CE6602	Structural Analysis II
46.	VI	13C312	CE6603	Design Of Steel Structures
47.	VI	13C313	CE6604	Railways, Airports And Harbour Engineering
48.	VI	13C314	CE6605	Environmental Engineering II
49.	VI	13C315(PE-I)	CE6002	Concrete Technology
50.	VI	13C316	CE6611	Environmental Engineering Laboratory
51.	VI	13C317	CE6612	Concrete And Highway Engineering Laboratory
52.	VII	13C401	CE6701	Structural Dynamics And Earthquake Engineering
53.	VII	13C402	CE6702	Prestressed Concrete Structures
54.	VII	13C403	CE6703	Water Resources And Irrigation Engineering
55.	VII	13C404	CE6704	Estimation And Quantity Surveying
56.	VII	13C405 (PE-II)	CE6006	Traffic Engineering And Management
57.	VII	13C406 (PE-III)	EN6501	Municipal Solid Waste Management
58.	VII	13C407	CE6711	Computer Aided Design And Drafting Laboratory
59.	VII	13C408	CE6712	Design Project
60.	VII	13C409	MG6851	Principles Of Management
61.	VIII	13C410	CE6016	Prefabricated Structures
62.	VIII	13C411 (PE-IV)	CE6021	REPAIR AND REHABILITATION OF STRUCTURES
63.	VIII	13C412	CE6811	Project Work

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**Course Outcomes (CO)**

**HS 6151 – TECHNICAL ENGLISH – I**

<b>13C101.1</b>	Develop the learners' basic communication skills in English by listening audios and long text
<b>13C101.2</b>	Explain technical things and develop instructions and recommendations.
<b>13C101.3</b>	Summarize cohesively and coherently without grammatical errors ,organize the ideas logically on a topic
<b>13C101.4</b>	Interpret charts and graphs and illustrate different types of essays.
<b>13C101.5</b>	Apply the technical strategies in E-Learning and develop E-Communication Skills

**MA6151 –MATHEMATICS – I**

<b>13C102.1</b>	Apply the concept of orthogonal transformation to diagonals the given matrix..
<b>13C102.2</b>	Apply the comparison test , Integral test, D' Alembert's ratio test and Leibnitz' s test to verify the convergence.
<b>13C102.3</b>	Find the radius of curvature, circle of curvature and Centre of curvature of a given curve.
<b>13C102.4</b>	Identify maxima and minima in two variables using partial differentiation.
<b>13C102.5</b>	Apply multiple integral techniques in evaluating Area and Volume of Solids

<b>PH 6151 – ENGINEERING PHYSICS–I</b>	
<b>13C103.1</b>	Outline the various crystal structure and its growth techniques
<b>13C103.2</b>	Illustrate basic concepts of stress and strain in solids and one dimensional Heat transfer
<b>13C103.3</b>	Illustrate the quantum theory and its applications
<b>13C103.4</b>	Apply the knowledge of acoustics in designing buildings
<b>13C103.5</b>	Classify the type of optical fiber and Laser

<b>CY6151 – ENGINEERING CHEMISTRY-I</b>	
<b>13C104.1</b>	List the various methods involved in the polymerization techniques.
<b>13C104.2</b>	Apply the concepts of Thermodynamic laws in engineering applications.
<b>13C104.3</b>	Outline the molecular structure by using spectroscopic techniques.
<b>13C104.4</b>	Illustrate the basic concepts of phase rule for the purpose and significance of alloying.
<b>13C104.5</b>	Apply the basics of Nano materials and their properties in various applications.

<b>GE6151 – COMPUTER PROGRAMMING</b>	
<b>13C105.1</b>	Explain the Organization of a Computer and number systems.
<b>13C105.2</b>	Explain the attributes of algorithm and programming basics
<b>13C105.3</b>	Apply arrays and string functions in simple C programs
<b>13C105.4</b>	Explain functions and pointers for solving problems
<b>13C105.5</b>	Apply structure and union in simple C applications

<b>GE 6152 – ENGINEERING GRAPHICS</b>	
<b>13C106.1</b>	Discuss the orthographic views of Engineering components.
<b>13C106.2</b>	Relate to basic principles of orthographic projection for drawing projection of points, lines and planes.
<b>13C106.3</b>	Apply basic principles of orthographic projection for drawing projection of solids like prisms, pyramids, cone and cylinder.
<b>13C106.4</b>	Show the sectioned view of solids and the development of solid surfaces
<b>13C106.5</b>	Show the isometric projection and perspective views for simple solids.

<b>GE6161 – COMPUTER PRACTICES LABORATORY</b>	
<b>13C107.1</b>	Apply word processor and it's basic features
<b>13C107.2</b>	Explain various formatting tools, types of tables, drawing tools and mail merging for effective documentation
<b>13C107.3</b>	Apply Spread sheet and it's salient features for Problem solving
<b>13C107.4</b>	Apply basic programs in C language for problem solving
<b>13C107.5</b>	Apply suitable data structures and functions in C programs
<b>13C107.6</b>	Exhibit ethical principles in engineering practices
<b>13C107.7</b>	Perform task as individual and /or team member to manage the task in time
<b>13C107.8</b>	Express the engineering activities with effective presentation and report
<b>13C107.9</b>	Interpret the finding with appropriate technological /research citation

<b>GE6162 – ENGINEERING PRACTICES LABORATORY</b>	
13C108.1	Explain the various manufacturing process in smithy, foundry, fitting, assembling and disassembling and will be able to provide effective presentation.
13C108.2	Summarize the operations of various machine tools lathe , drilling
13C108.3	Develop models by using skills achieved from workshop sections like welding, carpentry, sheet metal and plumbing
13C108.4	Apply the skills of basic electrical engineering for domestic wiring practices
13C108.5	Apply the measuring instruments like energy meter and perform measurements in electrical circuits.
13C108.6	Explain the working of electronic components.
13C108.7	Apply the electronic principle for develop engineering circuits.
13C108.8	Exhibit ethical principles in engineering practices
13C108.9	Perform task as individual and /or team member to manage the task in time
13C108.10	Express the engineering activities with effective presentation and report
<b>C108.11</b>	Interpret the finding with appropriate technological /research citation

<b>GE6163 – PHYSICS AND CHEMISTRY LABORATORY– I</b>	
<b>13C109.1</b>	Find the wavelength and particle size using laser and thermal conductivity of bad conductors using Lee’s Disc
<b>13C109.2</b>	Compare the Young’s modulus of the material by non uniform bending and the wavelength of mercury spectrum using Spectrometer grating both individually and by team work
<b>13C109.3</b>	List the velocity of ultrasonic waves in different liquids like water and kerosene
<b>13C109.4</b>	Estimate strength of acids quantitatively based on the conductance and PH level

	of the solution both individually and in teams
<b>13C109.5</b>	Estimate water quality parameters such as dissolved oxygen content, chloride content and iron content of the water samples both individually and in teams .
<b>13C109.6</b>	Exhibit ethical principles in engineering practices
<b>13C109.7</b>	Perform task as individual and /or team member to manage the task in time
<b>13C109.8</b>	Express the engineering activities with effective presentation and report
<b>13C109.9</b>	Interpret the finding with appropriate technological /research citation

<b>HS 6251 – TECHNICAL ENGLISH – II</b>	
<b>13C110.1</b>	Explain convincingly their opinions and also initiate, negotiate and argue using appropriate communicative strategies.
<b>13C110.2</b>	Apply the basic grammar techniques to enhance the language
<b>13C110.3</b>	Make use of the importance of writing skills and its techniques
<b>13C110.4</b>	Develop various types and formats of reports, emails, resumes, letters, to meet particular needs or purposes
<b>13C110.5</b>	Apply skills pertaining to presentation, group discussion, creative and critical thinking in everyday life

<b>MA6251 –MATHEMATICS – II</b>	
<b>13C111.1</b>	Solve the line integral, surface integral and volume integral in Engineering applications
<b>13C111.2</b>	Solve simultaneous first order linear equations with constant coefficients.
<b>13C111.3</b>	Solve the second order ODE by Laplace transformation.
<b>13C111.4</b>	Find the analytic functions by Milne Thomson method
<b>13C111.5</b>	Solve real definite integrals , contour integrals around unit circle and semi-circle

### **PH 6251 – ENGINEERING PHYSICS–II**

<b>13C112.1</b>	Infer the electrical properties of material and quantum theory.
<b>13C112.2</b>	Classify the type of semiconductor and its uses.
<b>13C112.3</b>	Outline the magnetic properties of different materials and superconductivity.
<b>13C11.4</b>	Apply the knowledge of polarization in polaroid's
<b>13C112.5</b>	Interpret the metallic glasses, Nano Materials and Biomaterials

### **CY6251 – ENGINEERING CHEMISTRY-II**

<b>13C113.1</b>	Explain the concepts of various water treatment process.
<b>13C113.2</b>	Apply the principles of electrochemical reactions in prevention of materials from corrosion.
<b>13C113.3</b>	Explain the working of power plants using conventional and non-conventional sources of energy such as nuclear, solar and wind
<b>13C113.4</b>	Illustrate knowledge of metals for Engineering Applications
<b>13C113.5</b>	Explain various types of fuels, their manufacturing processes and calculation of calorific theoretically

### **GE6252 – BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

<b>13C114.1</b>	Analyzethe D.C electric circuits.
<b>13C114.2</b>	Explain the working principle & Performance Characteristics of DC machines.
<b>13C114.3</b>	Relate the characteristics of semiconducting devices
<b>13C114.4</b>	Show the performance of various logic gates and flip flops.
<b>13C114.5</b>	Explain the type of signals and communication systems.

**GE 6253 – ENGINEERING MECHANICS**

<b>13C115.1</b>	Illustrate the vector and scalar representation of forces of bodies in two dimension and three dimensions.
<b>13C115.2</b>	Show the resultant force, moment for a system of forces.
<b>13C115.3</b>	Relate the centroid, centre of gravity, moment of inertia for different geometry.
<b>13C115.4</b>	Apply the principle of dynamic equilibrium for rigid bodies
<b>13C115.5</b>	Demonstrate the value of frictional force under equilibrium condition.

**GE6261 – COMPUTER AIDED DRAFTING AND MODELLING LABORATORY**

<b>13C116.1</b>	Explain the Principles of planning, orientation of Building
<b>13C116.2</b>	Sketch the plan elevation and sectional views of the buildings using appropriate software
<b>13C116.3</b>	Develop draft the plan elevation and sectional views of the industrial structures using appropriate software.
<b>13C116.4</b>	Develop draft the plan elevation and sectional views of framed building using appropriate software.
<b>13C116.5</b>	Show the Industrial buildings – North light roof structures using appropriate software.
<b>13C116.6</b>	Exhibit ethical principles in engineering practices
<b>13C116.7</b>	Perform task as individual and /or team member to manage the task in time
<b>13C116.8</b>	Express the engineering activities with effective presentation and report
<b>13C116.9</b>	Interpret the finding with appropriate technological /research citation

**GE6262 – PHYSICS AND CHEMISTRY LABORATORY– II**

<b>13C117.1</b>	Find the particle size by diode laser .
<b>13C117.2</b>	List out the thermal conductivity of bad conductors .
<b>13C117.3</b>	Show the velocity of ultrasonic waves in different liquids like water and kerosene
<b>13C117.4</b>	Show the iron content of the given solution using potentiometer
<b>13C117.5</b>	Relate water quality parameters such as alkalinity, hardness, Sodium of the water samples both individually and in teams.
<b>13C117.6</b>	Exhibit ethical principles in engineering practices
<b>13C117.7</b>	Perform task as individual and /or team member to manage the task in time
<b>13C117.8</b>	Express the engineering activities with effective presentation and report
<b>13C117.9</b>	Interpret the finding with appropriate technological /research citation

**MA6351– TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS**

<b>13C201.1</b>	Formulate simple Engineering problems as Partial Differential Equations
<b>13C201.2</b>	Apply the concept of Fourier series in solving boundary value problems
<b>13C201.3</b>	Solve the standard Partial Differential Equations in engineering problems like Wave equation, Heat flow equation by Fourier series.
<b>13C201.4</b>	Solve Fourier, Fourier Sine and Cosine transforms and properties
<b>13C201.5</b>	Understand the discrete transform applied to engineering problems.

<b>GE6351 - ENVIRONMENTAL SCIENCE AND ENGINEERING</b>	
<b>13C202.1</b>	Illustrate the features of Ecosystem& biodiversity
<b>13C202.2</b>	Choose pollution control methods and waste management.
<b>13C202.3</b>	Apply the environmental concepts for conservation and protection of natural resources.
<b>13C202.4</b>	Demonstrate the impact of social issues on environment
<b>13C202.5</b>	Demonstrate the impact of human on environment.

<b>CE6301 - ENGINEERING GEOLOGY</b>	
<b>13C203.1</b>	Explain the geological featuresof the earth.
<b>13C203.2</b>	Demonstrate the physical properties of minerals.
<b>13C203.3</b>	Identify common rocks based on their physical properties.
<b>13C203.4</b>	Illustrate the various geological maps and interpretation of geological data for subsurface investigations
<b>13C203.5</b>	Explain the application of geological investigation in projects such as dams, tunnels, bridges, roads, airport and harbor

<b>CE6302 -MECHANICS OF SOLIDS</b>	
<b>13C204.1</b>	Explain the concepts of stress and strain, principal stresses and principal planes in a deformable material.
<b>13C204.2</b>	Solve the internal forces subject to axial loads, shear, torsion and bending and plot their distributions.
<b>13C204.3</b>	Solve the deflection of beam under various loading condition
<b>13C204.4</b>	Apply basic equation of torsion in design of circular shafts and helical springs
<b>13C204.5</b>	Analyze the pin jointed plane and determine trusses by method of joints and tension coefficient method.

<b>CE6303 - MECHANICS OF FLUIDS</b>	
<b>13C205.1</b>	Illustrate the basic properties of the fluid and fluid statics
<b>13C205.2</b>	Explain the mechanics of fluids in motion by describing and observing the fluid phenomena
<b>13C205.3</b>	Analyse the flow through pipes and the major and minor energy losses.
<b>13C205.4</b>	Understand the concept of development of boundary layer over a long thin plate
<b>13C205.5</b>	Apply dimensional analysis to identify the fundamental variables that define flow

<b>CE6304 - SURVEYING I</b>	
<b>13C206.1</b>	Explain the importance and principle of surveying, different types of surveys and techniques used in surveying.
<b>13C206.2</b>	Illustrate the errors present in surveying measurement and their significance
<b>13C206.3</b>	Identify the different types of leveling in civil engineering work
<b>13C206.4</b>	Explain the various Leveling methods used to calculate the area of tract of land
<b>13C20.5</b>	Apply different methods used for angular measurements, and calculate the elevation of objects

<b>CE6311 - SURVEY PRACTICAL I</b>	
<b>13C207.1</b>	Demonstrate the concept of open traverse surveying and apply the same on the fields.
<b>13C207.2</b>	Demonstrate the concept of leveling to find elevations of different points in the field.
<b>13C207.3</b>	Make use of theodolite to undertake survey..
<b>13C207.4</b>	Make use of tachometer to undertake survey

<b>13C207.5</b>	Make use of plane table and compass undertake the survey.
<b>13C207.6</b>	Exhibit ethical principles in engineering practices
<b>13C207.7</b>	Perform task as individual and /or team member to manage the task in time
<b>13C207.8</b>	Express the engineering activities with effective presentation and report
<b>13C207.9</b>	Interpret the finding with appropriate technological /research citation

<b>CE6312- COMPUTER AIDED BUILDING DRAWING</b>	
<b>13C208.1</b>	Explain the Principles of planning, orientation of Building
<b>13C208.2</b>	Sketch the plan elevation and sectional views of the buildings using appropriate software
<b>13C208.3</b>	Develop draft the plan elevation and sectional views of the industrial structures using appropriate software.
<b>13C208.4</b>	Develop draft the plan elevation and sectional views of framed building using appropriate software.
<b>13C208.5</b>	Show the Industrial buildings – North light roof structures using appropriate software.
<b>13C208.6</b>	Exhibit ethical principles in engineering practices
<b>13C208.7</b>	Perform task as individual and /or team member to manage the task in time
<b>13C208.8</b>	Express the engineering activities with effective presentation and report
<b>13C208.9</b>	Interpret the finding with appropriate technological /research citation

<b>MA6459 – NUMERICAL METHODS</b>	
<b>13C209.1</b>	Solve the system of linear algebraic equations in Civil Engineering
<b>13C209.2</b>	Apply the interpolation technique for solving real time engineering problems
<b>13C209.3</b>	Solve single and double integrals using numerical techniques
<b>13C209.4</b>	Compute the solution of first order differential equation using various finite difference method
<b>13C209.5</b>	Solve ordinary and partial differential equations using numerical methods

<b>CE6401- CONSTRUCTION MATERIALS</b>	
<b>13C210.1</b>	Compare the properties of most common and advanced building materials
<b>13C210.2</b>	Illustrate the typical and potential application of lime, cement and aggregates
<b>13C210.3</b>	Explain the production of concrete and also the method of placing and making of concrete elements
<b>13C210.4</b>	Summarize the applications of timber and other materials used in construction
<b>13C210.5</b>	Explain the various types of modern materials in construction.

<b>CE6402 -STRENGTH OF MATERIALS</b>	
<b>13C211.1</b>	Interpret strain energy and carry out computations in deflection of beams and frames
<b>13C211.2</b>	Analyze cantilever, fixed beams and continuous beams using theorem of three moment equation for external loadings and support settlements.
<b>13C211.3</b>	Interpret Eulers and Rankine- Gordon formula and carry out the load carrying capacity of columns and induced stress.
<b>13C211.4</b>	Identify the Principal stresses and principal strain in three dimensional by using the theory of failure concept
<b>13C211.5</b>	Solve the bending stresses in symmetrical and unsymmetrical sections

<b>CE6403 - APPLIED HYDRAULIC ENGINEERING</b>	
<b>13C212.1</b>	Analyse the Uniform Flows in open channels
<b>13C212.2</b>	Interpret Dynamic Equation and its applications and carry out computations in gradually varied flow
<b>13C212.3</b>	Interpret Momentum Equation and its applications and carry out computations in uniform, gradually and rapidly varied flows in steady state conditions.
<b>13C212.4</b>	Illustrate the working of turbines and its performance.
<b>13C212.5</b>	Illustrate the working of pumps and its performance.

<b>CE6404 - SURVEYING II</b>	
<b>13C213.1</b>	Explain the method of Leveling and setting Levels with different instruments
<b>13C213.2</b>	Explain the method of correction with different instruments
<b>13C213.3</b>	Summarizethe working principle and usage of total station instruments.
<b>13C213.4</b>	Infer various GPS surveying methods and processing techniques used in GPS
<b>13C213.5</b>	Illustrate the Concepts of astronomical surveying and methods to determine time, longitude, latitude and azimuth.

### **CE6405- SOIL MECHANICS**

<b>13C214.1</b>	Explain the properties of soils and interpret the experimental data to classify and identify soil.
<b>13C214.2</b>	Explain the concepts and evaluate permeability of soil.
<b>13C214.3</b>	Solve principle stress distribution of soil by different theories
<b>13C214.4</b>	Explain the concepts in shear parameters of soil.
<b>13C214.5</b>	Solve the factor of safety in finite and infinite slopes by different method

### **CE6411 - STRENGTH OF MATERIALS LABORATORY**

<b>13C215.1</b>	Demonstrate experiments for tension on steel rod
<b>13C215.2</b>	Demonstrate experiments for compression, shear and torsion on steel rod
<b>13C215.3</b>	Make use of variousequipments to test impact test on metal specimen
<b>13C215.4</b>	Make use of variousequipments to test Hardness on metals
<b>13C215.5</b>	Make use of variousequipments to test deflection test on metal beam and spring
<b>13C215.6</b>	Exhibit ethical principles in engineering practices
<b>13C215.7</b>	Perform task as individual and /or team member to manage the task in time
<b>13C215.8</b>	Express the engineering activities with effective presentation and report
<b>13C215.9</b>	Interpret the finding with appropriate technological /research citation

<b>CE6412- HYDRAULIC ENGINEERING LABORATORY</b>	
<b>13C216.1</b>	Calibrate flow measuring devices used in pipes, channels and tanks
<b>13C216.2</b>	Demonstrate practical understanding of friction losses and minor losses in internal flows Compare the results of analytical models introduced in lecture to the actual behaviour of real fluid flows and draw correct and sustainable conclusions.
<b>13C216.3</b>	Demonstrate the experimental and theoretical efficiency of pump
<b>13C216.4</b>	Demonstrate the experimental and theoretical efficiency of turbines
<b>13C216.5</b>	Make use of equipment's to determine Metacentric height of floating bodies
<b>13C216.6</b>	Exhibit ethical principles in engineering practices
<b>13C216.7</b>	Perform task as individual and /or team member to manage the task in time
<b>13C216.8</b>	Express the engineering activities with effective presentation and report
<b>13C216.9</b>	Interpret the finding with appropriate technological /research citation

**CE6413- SURVEY PRACTICAL II**

<b>13C217.1</b>	Explain the hands-on experience of instruments survey instruments
<b>13C217.2</b>	Make use of compass and plane table to undertake survey
<b>13C217.3</b>	Make use of tachometer to undertake survey
<b>13C217.4</b>	Find the horizontal distance and elevation of different object by Theodolite
<b>13C217.5</b>	Explain the Setting out works and foundation marking
<b>13C217.6</b>	Exhibit ethical principles in engineering practices
<b>13C217.7</b>	Perform task as individual and /or team member to manage the task in time
<b>13C217.8</b>	Express the engineering activities with effective presentation and report
<b>13C217.9</b>	Interpret the finding with appropriate technological /research citation

**CE6501- STRUCTURAL ANALYSIS I**

<b>13C301.1</b>	Develop the influence line for indeterminate beams using Muller Breslau
<b>13C301.2</b>	Explain the concept of influence line technique for determinate beams
<b>13C301.3</b>	Classify the various types of arches
<b>13C301.4</b>	Apply the force equilibrium conditions to analyse the continuous beams and rigid frames by slope deflection method
<b>13C301.5</b>	Apply the concept of moment distribution and analysis of continuous beams and rigid frames with and without sway.

## **CE6502- FOUNDATION ENGINEERING**

<b>13C302.1</b>	Demonstrate consolidation and settlement characteristics of soil.
<b>13C302.2</b>	Explain bearing capacity of soil to design a shallow foundation
<b>13C302.3</b>	Compare the rectangular and trapezoidal combined footings.
<b>13C302.4</b>	Explain the concepts of pile foundations.
<b>13C302.5</b>	Explain the earth pressure on retaining walls and analysis for stability

## **CE6503- ENVIRONMENTAL ENGINEERING I**

<b>13C303.1</b>	Explain various parameters of collection, treatment and distribution of water.
<b>13C303.2</b>	Explain various parameters of conveyance of water.
<b>13C303.3</b>	Demonstrate and apply the design principles in designing the various functional units in water treatment
<b>13C303.4</b>	Summarize water quality criteria, standards and water treatment techniques.
<b>13C303.5</b>	Explain basic structure of drinking water supply systems and design the component systems of water treatment facilities

## **CE6504- HIGHWAY ENGINEERING**

<b>13C304.1</b>	Identify and Prioritize highway proposals for road development and decide the route alignment
<b>13C304.2</b>	Analyse and design the components of horizontal and vertical alignment of highways as per IRC specifications
<b>13C304.3</b>	Analyse and design highway pavements and highway drainage
<b>13C304.4</b>	Select and analyze different materials required for road construction
<b>13C304.5</b>	Illustrate the concept of pavement management system

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<b>CE6505- DESIGN OF REINFORCED CONCRETE ELEMENTS</b>	
<b>13C305.1</b>	Review the reinforced concrete structural elements using various methods.
<b>13C305.2</b>	Explain the reinforced concrete slab and staircase by limit state method
<b>13C305.3</b>	Compute shear and torsion for reinforced concrete beams by limit state method
<b>13C305.4</b>	Use limit state method in reinforced concrete column
<b>13C305.5</b>	Compute the reinforced concrete footing as per limit state method.

<b>CE6506- CONSTRUCTION TECHNIQUES, EQUIPMENT AND PRACTICE</b>	
<b>13C306.1</b>	Explain the factors to be considered in construction of building and develop the construction and techniques
<b>13C306.2</b>	Explain the various techniques in masonry construction, flooring and roofing
<b>13C306.3</b>	Interpret the different substructure construction and study the basic requirement
<b>13C306.4</b>	Explain the methods and techniques involved in construction of super structure
<b>13C306.5</b>	Demonstrate the operation of power tools and equipment used in the building construction sites

<b>GE6674 - COMMUNICATION AND SOFT SKILLS- LABORATORY BASED</b>	
<b>13C307.1</b>	Interpret ideas convincingly with clear utterances
<b>13C307.2</b>	Build general and academic listening skills and respond in different situation
<b>13C307.3</b>	Explain opinion and converse effectively both formal and informal conversation
<b>13C307.4</b>	Develop and apply skills to GD
<b>13C307.5</b>	Make use of communicative techniques and speak fluently in English throughout their life
<b>13C307.6</b>	Exhibit ethical principles in engineering practices

<b>13C307.7</b>	Perform task as individual and /or team member to manage the task in time
<b>13C307.8</b>	Express the engineering activities with effective presentation and report
<b>13C307.9</b>	Interpret the finding with appropriate technological /research citation

<b>CE6511- SOIL MECHANICS LABORATORY</b>	
<b>13C308.1</b>	Experiments with different equipments compute the index properties of soil .
<b>13C308.2</b>	Experiments with different equipments compute the field density, moisture content and maximum dry density.
<b>13C308.3</b>	Compute the co-efficient of permeability through different types of soils by constant head and falling head methods
<b>13C308.4</b>	Demonstrate the shear strength of soil, and shear parameters from different laboratory tests like Vane shear test, Direct shear test and Unconfined compression test
<b>13C308.5</b>	Experiments with different equipments compute the index properties of soil .
<b>13C308.6</b>	Exhibit ethical principles in engineering practices
<b>13C308.7</b>	Perform task as individual and /or team member to manage the task in time
<b>13C308.8</b>	Express the engineering activities with effective presentation and report
<b>13C308.9</b>	Interpret the finding with appropriate technological /research citation

<b>CE6512- SURVEY CAMP</b>	
<b>13C309.1</b>	Express various types of survey in the field as per the requirements
<b>13C309.2</b>	Operate land survey using advanced instruments
<b>13C309.3</b>	Prepare contour map for the given area

<b>13C309.4</b>	Locate offset of Buildings
<b>13C309.5</b>	Use of GPS to determine latitude and longitude
<b>13C309.6</b>	Exhibit ethical principles in engineering practices
<b>13C309.7</b>	Perform task as individual and /or team member to manage the task in time
<b>13C309.8</b>	Express the engineering activities with effective presentation and report
<b>13C309.9</b>	Interpret the finding with appropriate technological /research citation

### **CE6601 -DESIGN OF REINFORCED CONCRETE & BRICK MASONRY STRUCTURES**

<b>13C310.1</b>	Compute and draw reinforced concrete Cantilever and Counterfort Retaining Walls
<b>13C310.2</b>	Calculate and draw reinforced concrete water tanks
<b>13C310.3</b>	Predict the reinforced concrete slab and staircase by limit state method
<b>13C310.4</b>	Explain about the yield line theory for different slab cross sections
<b>13C310.5</b>	Classify brick masonry structures based on design loads

### **CE 6602 - STRUCTURAL ANALYSIS II**

<b>13C311.1</b>	Analyse the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method.
<b>13C311.2</b>	Demonstrate the concept of matrix stiffness method and analysis of continuous beams, pin jointed trusses and rigid plane frames.
<b>13C311.3</b>	Explain the concept of plastic analysis in beams and frames.
<b>13C311.4</b>	Explain the plastic analysis of the suspension bridges with stiffening girders
<b>13C311.5</b>	Identify the concept of plastic analysis in beams and frames.

<b>CE6603- DESIGN OF STEEL STRUCTURES</b>	
<b>13C312.1</b>	Identify the different failure modes of bolted and welded connections, and determine their design strengths.
<b>13C312.2</b>	Compute tension members using rolled steel sections
<b>13C312.3</b>	Summarize compression members using rolled steel sections
<b>13C312.4</b>	Compute and design the flexural member as laterally restrained and unrestrained beams
<b>13C312.5</b>	Construct the roof trusses and gantry girders systems as per the provision of IS800-2007

<b>CE6604 - RAILWAYS, AIRPORTS AND HARBOUR ENGINEERING</b>	
<b>13C313.1</b>	State the methods of route alignment and design elements in Railway Planning and Constructions
<b>13C313.2</b>	Describe location of railway station , yards and other amenities
<b>13C313.3</b>	Prepare layout for airport and classify
<b>13C313.4</b>	Sketch the geometric design of airport components
<b>13C313.5</b>	Prepare the plan for various harbour structures

<b>CE6605 - ENVIRONMENTAL ENGINEERING II</b>	
<b>13C314.1</b>	Explain the concepts of sewage systems and estimation of sanitary sewage flow.
<b>13C314.2</b>	Demonstrate the design of sewer system and plumbing systems for buildings
<b>13C314.3</b>	Explain primary design of the unit operations and processes that are used in sewage treatment
<b>13C314.4</b>	Explain secondary treatment processes that are used in sewage treatment
<b>13C314.5</b>	Relate disposal of sludge and sewage management

<b>CE6002-CONCRETE TECHNOLOGY</b>	
<b>13C315.1</b>	Classify properties of different ingredients of concrete such as cement, aggregate and water
<b>13C315.2</b>	Explain chemical properties of admixtures and classification of materials used in construction
<b>13C315.3</b>	Explain concept and procedure of mix design as per IS method
<b>13C315.4</b>	Express the properties of fresh and hardened concrete
<b>13C315.5</b>	Explain the importance and application of special concrete

<b>CE6611-ENVIRONMENTAL ENGINEERING LABORATORY</b>	
<b>13C316.1</b>	Analyse the physical characteristics viz. colour, turbidity, hardness and conductivity of a given water sample
<b>13C316.2</b>	Analyse the chemical characteristics of a given water sample viz. pH, acidity, alkalinity
<b>13C316.3</b>	Analyse the chemical characteristics of a given water sample viz. chlorides, Iron, Available Chlorine and sulphates content to assess its suitability for drinking purposes
<b>13C316.4</b>	Analyse the Dissolved oxygen content, Biological Oxygen Demand and Chemical Oxygen Demand in waste water
<b>13C316.5</b>	Estimate the optimum dosage of alum using Jar test
<b>13C316.6</b>	Exhibit ethical principles in engineering practices
<b>13C316.7</b>	Perform task as individual and /or team member to manage the task in time
<b>13C316.8</b>	Express the engineering activities with effective presentation and report
<b>13C316.9</b>	Interpret the finding with appropriate technological /research citation

<b>CE6612- CONCRETE AND HIGHWAY ENGINEERING LABORATORY</b>	
<b>13C317.1</b>	Recognize the different test on aggregate
<b>13C317.2</b>	Practice various test on bitumen
<b>13C317.3</b>	Identify the Binder Content in bitumen
<b>13C317.4</b>	Apply Marshall Stability and Flow Values
<b>13C317.5</b>	Estimate to characterize various pavement test on bitumen mixes
<b>13C317.6</b>	Exhibit ethical principles in engineering practices
<b>13C317.7</b>	Perform task as individual and /or team member to manage the task in time
<b>13C317.8</b>	Express the engineering activities with effective presentation and report
<b>13C317.9</b>	Interpret the finding with appropriate technological /research citation

<b>CE6701-STRUCTURAL DYNAMICS AND EARTHQUAKE ENGINEERING</b>	
<b>13C401.1</b>	Infer the Concept of vibration of concrete structures.
<b>13C401.2</b>	Explain the degree of freedom system
<b>13C401.3</b>	Classify the earthquake forces and concepts in seismology
<b>13C401.4</b>	Summarize Earthquake forces in different type of structures
<b>13C401.5</b>	Identify the detailing of Earthquake resistant forces in masonry and reinforced concrete structures

## **CE6702-PRESTRESSED CONCRETE STRUCTURES**

<b>13C402.1</b>	Illustrate the behaviour of prestressed concrete beams and slab
<b>13C402.2</b>	Identify the effects of transfer and development length on flexural and shear strengths
<b>13C402.3</b>	Explain the anchorage zone stress and end block for prestressed concrete structures
<b>13C402.4</b>	Develop the design of prestressed composite beam.
<b>13C402.5</b>	Summarize the methods in prestressed concrete technology

## **CE6703-WATER RESOURCES AND IRRIGATION ENGINEERING**

<b>13C403.1</b>	Outline the ideas of Water resources in drinking and irrigation
<b>13C403.2</b>	Explain a brief description on water resource management
<b>13C403.3</b>	Summarize the irrigation engineering and estimate the consumptive use of water
<b>13C403.4</b>	Illustrate the list of structural elements in canal irrigation
<b>13C403.5</b>	Illustrate the ideas of irrigation methods and management

## **CE6704-ESTIMATION AND QUANTITY SURVEYING**

<b>13C404.1</b>	Summarize the method of calculate the quantities
<b>13C404.2</b>	Explain the rate of quantities of building and other structures
<b>13C404.3</b>	List the types of tenders and contracts
<b>13C404.4</b>	Develop the rates of old buildings and rent calculations.
<b>13C404.5</b>	Explain the basic principles for report preparation in civil engineering works

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## **CE6006- TRAFFIC ENGINEERING AND MANAGEMENT**

<b>13C405.1</b>	Explain the basic properties of traffic and their application in real world problems
<b>13C405.2</b>	Describe the variation of traffic volume and calculate the traffic density and the Statistical applications in traffic studies and traffic forecasting
<b>13C405.3</b>	Explain the Significant roles of traffic control personnel
<b>13C405.4</b>	Explain the Traffic and environment hazards
<b>13C405.5</b>	Describe the Intelligent Transport System for traffic management, enforcement and education

## **EN6501- MUNICIPAL SOLID WASTE MANAGEMENT**

<b>13C406.1</b>	Explain the Sources and types of municipal solid wastes.
<b>13C406.2</b>	Summarize the various methods of social and financial aspects in municipal solid waste.
<b>13C406.3</b>	Identify the methods of collection and transfer of solid wastes.
<b>13C406.4</b>	List the off –site Processing techniques in solid waste.
<b>13C406.5</b>	Identify various laws related to solid waste management

**CE6711- COMPUTER AIDED DESIGN AND DRAFTING  
LABORATORY**

<b>13C407.1</b>	Design and drawing of beam and column with reinforcement details
<b>13C407.2</b>	Design and drawing of solid slab and RCC Tee beam bridges for IRC loading and reinforcement details
<b>13C407.3</b>	Design and drawing of circular and rectangular RCC water tanks
<b>13C407.4</b>	Design and drawing of multi storeyed building
<b>13C407.5</b>	Design and drawing of RCC cantilever retaining walls with reinforcement details
<b>13C407.6</b>	Exhibit ethical principles in engineering practices
<b>13C407.7</b>	Perform task as individual and /or team member to manage the task in time
<b>13C407.8</b>	Express the engineering activities with effective presentation and report
<b>13C407.9</b>	Interpret the finding with appropriate technological /research citation

**CE6712- DESIGN PROJECT**

<b>13C408.1</b>	State the design principles and develop concept for the project
<b>13C408.2</b>	Estimate the time frame and cost for the project execution and completion
<b>13C408.3</b>	Analyze the project progress with remedial measures individual or in a team
<b>13C408.4</b>	Illustrate the environmental impact of the project

<b>13C408.5</b>	Demonstrate the project functionality along with report and presentation
<b>13C408.6</b>	Justify ethical principles in engineering practices
<b>13C408.7</b>	Perform multi-disciplinary task as an individual and / or team member to manage the project/task.
<b>13C408.8</b>	Comprehend the Engineering activities with effective presentation and report.
<b>13C408.9</b>	Interpret the findings with appropriate technological / research citation

<b>MG6851- PRINCIPLES OF MANAGEMENT</b>	
<b>13C409.1</b>	Understand the Evolution of Management, culture and types of Organization
<b>13C409.2</b>	Examine various Strategic planning tools and Techniques also can take part in decision making process.
<b>13C409.3</b>	Explain the need and importance of decision making for managers in the organization
<b>13C409.4</b>	Build the leadership style, Barriers to effective Communication, its impact and methods to overcome them
<b>13C409.5</b>	Explain various Controlling techniques to maintain standards in Organizations

<b>CE6016- PREFABRICATED STRUCTURES</b>	
<b>13C410.1</b>	Apply the modular coordination of prefabricated units
<b>13C410.2</b>	Demonstrate the behaviour of prefabricated components
<b>13C410.3</b>	Explain the design principle of prefabricated disuniting structure
<b>13C410.4</b>	Infer the various structural connections in prefabricated joints
<b>13C410.5</b>	Explain the design for abnormal loads in structures

<b>CE6021- REPAIR AND REHABILITATION OF STRUCTURES</b>	
<b>13C411.1</b>	Recognize the maintenance and repair strategies
<b>13C411.2</b>	Assess the durability due to various climate conditions
<b>13C411.3</b>	Explain the different type of special concrete
<b>13C411.4</b>	Use the various rehabilitation and retrofitting techniques.
<b>13C411.5</b>	Review the demolition techniques for structures

<b>CE6811-PROJECT WORK</b>	
<b>13C412.1</b>	Use literature to identify the objective, scope and the concept of the work
<b>13C412.2</b>	Apply suitable methods and materials to carry out experiments by conserving eco-system
<b>13C412.3</b>	Develop a prototype/experimental set-up necessary to complete the project
<b>13C412.4</b>	Discuss the results obtained to derive conclusions
<b>13C412.5</b>	Defend the work by preparing a report as per the University format.
<b>13C412.6</b>	Assess health, safety and legal relevant to professional engineering practices.
<b>13C412.7</b>	Comply the environmental needs and sustainable development.
<b>13C412.8</b>	Justify ethical principles in engineering practices
<b>13C412.9</b>	Perform multi-disciplinary task as an individual and / or team member to manage the project/task.
<b>13C412.10</b>	Comprehend the Engineering activities with effective presentation and report.
<b>13C412.11</b>	Interpret the findings with appropriate technological / research citation

**HOD**

**PRINCIPAL**

