Indra Ganesan
COLLEGE OF ENGINEERING

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
Accredited by NAAC with 'B+' Grade, 2(f) & 12B Status Institution by UGC
IG Valley, Madurai Main Road, Manikandam, Tiruchirappalli - 620012

NAAC DOCUMENTS

QUALITY INDICATOR FRAME WORK

CRITERION – 2

TEACHING-LEARNING AND EVALUATION

SUBMITTED BY

IQAC

INTERNAL QUALITY ASSURANCE CELL

INDRA GANESAN COLLEGE OF ENGINEERING

Criteria 2	Teaching-Learning and Evaluation	350

Key Indicator-2.6 Student Performances and Learning Outcome (90)

2.6.1 Programme Outcomes (POs) and Course Outcomes (COs) for all programmes offered by the institution are stated and displayed on website

DEPARTMENT OF CIVIL ENGINEERING –R 2017

INDRA GANESAN COLLEGE OF ENGINEERING

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India
(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF CIVIL ENGINEERING

REGULATION -2017

COURSE OUTCOMES

SEM –III

C202-CE8301 STRENGTH OF MATERIALS I

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C202.1	Explain the concepts of stress and strain, principal stresses and principal planes.	1,2,3,4,6,10,11,12	1,2
C202.2	Determine Shear force and bending moment in beams and understand concept of theory of simple bending.	1,2,3,4,6,10,11,12	1,2
C202.3	Calculate the deflection of beams by different methods and selection of method for Determining slope or deflection.	1,2,3,4,6,10,11,12	1,2
C202.4	Apply basic equation of torsion in design of circular shafts and helical springs.	1,2,3,4,6,10,11,12	1,2
C202.5	Analyze the pin jointed plane and space trusses	1,2,3,4,6,10,11,12	1,2
C202.6	Interpret adequate knowledge on materials strength and its behavior under external loading.	1,2,3,4,6,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C202.1	3	3	2	2	-	2	-	-	-	2	1	1	2	2
C202.2	3	3	2	2	-	2	-	-	-	2	1	1	2	2
C202.3	3	3	2	2	-	2	-	-	-	2	1	1	2	2
C202.4	3	3	2	2	-	2	-	-	-	2	1	1	2	2
C202.5	3	3	2	2	-	2	-	-	-	2	1	1	2	2
C202.6	3	3	2	2	-	2	-	-	-	2	1	1	2	2
C202	3	3	2	2	-	2	-	-	-	2	1	1	2	2

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C203-CE8302 FLUID MECHANICS

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C203.1	Discuss a basic of fluids properties and fluid statics.	1,2,3,4,9,10,11,12	1,2
C203.2	Explain and solve the problems related to equation of motion in kinematic and dynamic equilibrium.	1,2,3,4,6,9,10,11,12	1,2
C203.3	Convert the dimensional into model analysis.	1,2,3,4.6,7,9,10,11,12	1,2
C203.4	Describe types of flow and losses of flow in pipes.	1,2,3,4,6,10,11,12	1,2
C203.5	Illustrate and solve the boundary layer problems.	1,2,3,4,10,11,12	1,2
C203.6	Summarize the properties and behavior of fluids.	1,2,3,4,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C203.1	3	2	2	2	-	-	-	-	1	2	1	1	2	2
C203.2	3	2	2	2	-	1	-	-	1	2	1	1	2	2
C203.3	3	2	2	2	-	1	1	-	1	2	1	1	2	2
C203.4	3	2	2	2	-	1	-	-	-	2	1	1	2	2
C203.5	3	2	2	2	-		-	-	-	2	1	1	2	2
C203.6	3	2	2	2	-	-	-	-	-	2	1	1	2	2
C203	3	2	2	2	-	1	1	-	1	2	1	1	2	2

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C204 - CE8351 SURVEYING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C204.1	Classify the various surveying instruments and mapping	1,2,3,4,5,10,11,12	1,2
C204.2	Illustrate horizontal angle and vertical angle using different instruments	1,2,3,4,5,10,11,12	1,2
C204.3	Identify the methods of leveling and setting levels with different instruments	1,2,3,4,5,10,11,12	1,2
C204.4	Demonstrate the concepts of astronomical surveying and methods to determine time, longitude, latitude and azimuth.	1,2,3,4,5,10,11,12	1,2
C204.5	Illustrate the concept and principle of modern surveying.	1,2,3,4,5,10,11,12	1,2
C204.6	Discuss various techniques available in basic surveying and they will be aware of modern surveying techniques available.	1,2,3,4,5,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C204.1	3	2	2	1	2	-	-	-	-	2	1	1	2	2
C204.2	3	2	2	1	2	-	-	-	-	2	1	1	2	2
C204.3	3	2	2	1	2	-	-	-	-	2	1	1	2	2
C204.4	3	2	2	1	2	-	-	-	-	2	1	1	2	2
C204.5	3	2	2	1	2	-	-	-	-	2	1	1	2	2
C204.6	3	2	2	1	2	-	-	-	-	2	1	1	2	2
C204	3	2	2	1	2	-	-	-	-	2	1	1	2	2

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C205 - CE8391 CONSTRUCTION MATERIALS

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C205.1	Compare the properties of most common and advanced building materials.	1,2,3,4,6,7,10,11,12	1,2
C205.2	Discuss the typical and potential applications of lime, cement and aggregates	1,2,3,4,6,7,10,11,12	1,2
C205.3	Explain the production of concrete and also the method of placing and making of concrete Elements.	1,2,3,4,6,7,10,11,12	1,2
C205.4	Summarize the applications of timbers and other materials	1,2,3,4,6,7,10,11,12	1,2
C205.5	Illustrate the importance of modern material for construction.	1,2,3,4,6,7,10,11,12	1,2
C205.6	Discuss the materials used in the construction industry.	1,2,3,4,6,7,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C205.1	2	2	1	1	-	2	2	-	-	2	1	1	2	2
C205.2	2	2	1	1	-	2	2	-	-	2	1	1	2	2
C205.3	2	2	1	1	-	2	2	-	-	2	1	1	2	2
C205.4	2	2	1	1	-	2	2	-	-	2	1	1	2	2
C205.5	2	2	1	1	-	2	2	-	-	2	1	1	2	2
C205.6	2	2	1	1	-	2	2	-	-	2	1	1	2	2
C205	2	2	1	1	-	2	2	-	-	2	1	1	2	2

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C206 - CE8392 ENGINEERING GEOLOGY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C206.1	Explain the importance of geological characteristics such as earth, earthquake, volcanism and the action of various geological agencies.	1,2,3,4,6,10,11,12	1,2
C206.2	Discuss basics knowledge on properties of minerals.	1,2,3,4,6,10,11,12	1,2
C206.3	Classify about types of rocks, their distribution and uses.	1,2,3,4,6,10,11,12	1,2
C206.4	Recognize the methods of study on geological structure.	1,2,3,4,6,10,11,12	1,2
C206.5	Demonstrate the application of geological investigation in projects such as dams, tunnels, bridges, roads, airport and harbor.	1,2,3,4,6,10,11,12	1,2
C206.6	Illustrate the importance of geology in Civil Engineering field.	1,2,3,4,6,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C206.1	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C206.2	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C206.3	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C206.4	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C206.5	3	2	1	1	-	2	2	-	-	2	1	1	2	2
C206.6	3	2	1	1	-	2	-	-	-	2	1	1	2	2
C206	3	2	1	1	-	2	2	-	-	2	1	1	2	2

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C207 - CE8311 CONSTRUCTION MATERIALS LABORATORY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C207.1	Conduct quality control tests on Fine Aggregates	1,2,4,8,9,10,11,12	1,2
C207.2	Conduct quality control tests on Coarse Aggregates	1,2,4,8,9,10,11,12	1,2
C207.3	Conduct quality control tests on concrete	1,2,4,8,9,10,11,12	1,2
C207.4	Perform quality control tests on bricks.	1,2,4,8,9,10,11,12	1,2
C207.5	Perform quality control tests on blocks.	1,2,4,8,9,10,11,12	1,2
C207.6	Perform quality control tests on tiles	1,2,4,8,9,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C207.1	3	2	2	2	-	-	-	3	3	2	1	1	2	2
C207.2	3	2	2	2	-	-	-	3	3	2	1	1	2	2
C207.3	3	2	2	2	-	-	-	3	3	2	1	1	2	2
C207.4	3	2	2	2	-	-	-	3	3	2	1	1	2	2
C207.5	3	2	2	2	-	-	-	3	3	2	1	1	2	2
C207.6	3	2	2	2	-	-	-	3	3	2	1	1	2	2
C207	3	2	2	2	-	-	-	3	3	2	1	1	2	2

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C208-CE8361 SURVEYING LABORATORY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C208.1	Experiment practical knowledge on handling chain survey.	1,2,3,4,8,9,11,12	1,2
C208.2	Demonstrate practical knowledge on handling compass survey.	1,2,3,4,8,9,11,12	1,2
C208.3	Determine on Levelling of land	1,2,3,4,8,9,11,12	1,2
C208.4	Relate practical knowledge on handling Theodolite	1,2,3,4,8,9,11,12	1,2
C208.5	Compare knowledge to carryout Triangulation and Tachometry survey.	1,2,3,4,8,9,11,12	1,2
C208.6	Demonstrate Total Station and GPS for surveying	1,2,3,4,8,9,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C208.1	3	3	1	1	-	-	-	3	3	-	1	1	2	2
C208.2	3	3	1	1	-	-	-	3	3	-	1	1	2	2
C208.3	3	3	1	1	-	-	-	3	3	-	1	1	2	2
C208.4	3	3	1	1	-	-	-	3	3	-	1	1	2	2
C208.5	3	3	1	1	-	-	-	3	3	-	1	1	2	2
C208.6	3	3	1	1	-	-	-	3	3	-	1	1	2	2
C208	3	3	1	1	-	-	-	3	3	-	1	1	2	2

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SEMESTER- IV

C211 - CE8401 Construction Techniques and Practices

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C211.1	Explain the different construction techniques and structural systems	1,2,3,4,6,10,11,12	1,2
C211.2	Illustrate various techniques and practices on masonry construction, flooring, and roofing.	1,2,3,4,6,10,11,12	1,2
C211.3	Analyze the requirements for substructure construction.	1,2,3,4,6,10,11,12	1,2
C211.4	Summarize the methods and techniques involved in the construction of various types of super structures	1,2,3,4,6,10,11,12	1,2
C211.5	Select, maintain and operate hand and power tools and equipment used in the building	1,2,3,4,6,10,11,12	1,2
C211.6	Explain the different construction techniques practices being followed in the Construction industry.	1,2,3,4,6,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C211.1	2	1	1	1	-	1	-	-	-	1	1	2	2	2
C211.2	2	1	1	1	-	1	-	-	-	1	1	2	2	2
C211.3	2	1	1	1	-	1	-	-	-	1	1	2	2	2
C211.4	2	1	1	1	-	1	-	-	-	1	1	2	2	2
C211.5	2	1	1	1	-	1	-	-	-	1	1	2	2	2
C211.6	2	1	1	1	-	1	-	-	-	1	1	2	2	2
C211	2	1	1	1	-	1	-	-	-	1	1	2	2	2

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C212 - CE8402 STRENGTH OF MATERIALS II

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C212.1	Determine the strain energy and compute the deflection of determinate beams, frames and trusses using energy principles.	1,2,3,4,6,10,11,12	1,2
C212.2	Analyze propped cantilever, fixed beams and continuous beams using theorem of three moment equation for external loadings and support settlements.	1,2,3,4,6,10,11,12	1,2
C212.3	Summarize the load carrying capacity of columns and stresses induced in columns and Cylinders	1,2,3,4,6,10,11,12	1,2
C212.4	Determine principal stresses and planes for an element in three-dimensional state of stress and study various theories of failure	1,2,3,4,6,10,11,12	1,2
C212.5	Determine the stresses due to Unsymmetrical bending of beams, locate the shear center, and find the stresses in curved beams.	1,2,3,4,6,10,11,12	1,2
C212.6	Associate the behavior of different types of structural elements used in the day to day life.	1,2,3,4,6,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C212.1	3	2	2	2	-	2	-	-	-	2	1	1	2	2
C212.2	3	2	2	2	-	2	-	-	-	2	1	1	2	2
C212.3	3	2	2	2	-	2	-	-	-	2	1	1	2	2
C212.4	3	2	2	2	-	2	-	-	-	2	1	1	2	2
C212.5	3	2	2	2	-	2	-	-	-	2	1	1	2	2
C212.6	3	2	2	2	-	2	-	-	-	2	1	1	2	2
C212	3	2	2	2	-	2	-	-	-	2	1	1	2	2

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C213 - CE 8403 APPLIED HYDRAULIC ENGINEERING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C213.1	Apply their knowledge of fluid mechanics in addressing problems in open channels.	1,2,3,4,6,9,10,11,12	1,2
C213.2	Identify an effective section for flow in different cross sections.	1,2,3,4,6,10,11,12	1,2
C213.3	Solve problems in uniform, gradually and rapidly varied flows in steady state conditions.	1,2,3,4,10,11,12	1,2
C213.4	Illustrate the principles, working and application of turbines.	1,2,3,4,10,11,12	1,2
C213.5	Explain the principles, working and application of pumps.	1,2,3,4,6,10,11,12	1,2
C213.6	Summarize the properties of fluid flow and machines propelled by the fluid flow	1,2,3,4,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C213.1	3	2	1	1	-	2	-	-	2	2	1	1	2	2
C213.2	3	2	1	1	-	2	-	-	-	2	1	1	2	2
C213.3	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C213.4	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C213.5	3	2	1	1	-	2	-	-	-	2	1	1	2	2
C213.6	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C213	3	2	1	1	-	2	-	-	-	2	1	1	2	2

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C214 - CE8404 CONCRETE TECHNOLOGY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C214.1	Describe the various requirements of cement, aggregates and water for making concrete.	1,2,3,4,10,11,12	1,2
C214.2	Illustrate the effect of admixtures on properties of concrete	1,2,3,4,10,11,12	1,2
C214.3	Convert the concept and procedure of mix design as per IS method	1,2,3,4,10,11,12	1,2
C214.4	Classify the properties of concrete at fresh and hardened state	1,2,3,4,10,11,12	1,2
C214.5	Explain the importance and application of special concretes.	1,2,3,4,10,11,12	1,2
C214.6	Discuss the properties of materials, concrete, admixtures and its applications.	1,2,3,4,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C214.1	3	2	2	1	-	-	-	-	-	2	1	1	2	2
C214.2	3	2	2	1	-	-	-	-	-	2	1	1	2	2
C214.3	3	2	2	1	-	-	-	-	-	2	1	1	2	2
C214.4	3	2	2	1	-	-	-	-	-	2	1	1	2	2
C214.5	3	2	2	1	-	-	-	-	-	2	1	1	2	2
C214.6	3	2	2	1	-	-	-	-	-	2	1	1	2	2
C214	3	2	2	1	-	-	-	-	-	2	1	1	2	2

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C215 -CE8491 SOIL MECHANICS

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C215.1	Classify the soil and assess the engineering properties and index properties	1,2,3,4,10,11,12	1,2
C215.2	Illustrate the stress concepts in soils	1,2,3,4,10,11,12	1,2
C215.3	Identify various settlements in soils	1,2,3,4,10,11,12	1,2
C215.4	Determine the shear strength of soil	1,2,3,4,6,10,11,12	1,2
C215.5	Analyze both finite and infinite slope stability	1,2,3,4,6,8,10,11,12	1,2
C215.6	Explain the basic properties of soil, its strength and its resistance to the external force.	1,2,3,4,6,8,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C215.1	3	2	2	2	-	-	-	-	-	2	1	1	2	2
C215.2	3	2	2	2	-	-	-	-	-	2	1	1	2	2
C215.3	3	2	2	2	-	-	-	-	-	2	1	1	2	2
C215.4	3	2	2	2	-	2	-	-	-	2	1	1	2	2
C215.5	3	2	2	2	-	2	-	2	-	2	1	1	2	2
C215.6	3	2	2	2	-	2	-	2	-	2	1	1	2	2
C215	3	2	2	2	-	2	-	2	-	2	1	1	2	2

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C216 -CE8481 STRENGTH OF MATERIALS LABORATORY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C216.1	Demonstrate the testing of steel rod	1,2,3,4,6,8,9,10,12	1,2
C216.2	Experiment in the area of testing of wood	1,2,3,4,6,8,9,10,12	1,2
C216.3	Explain in the area of testing metal	1,2,3,4,6,8,9,10,12	1,2
C216.4	Discuss the testing of beams and test on springs.	1,2,3,4,6,8,9,10,12	1,2
C216.5	Experiment testing various materials for its strength	1,2,3,4,6,8,9,10,12	1,2
C216.6	Explain the components of structural members.	1,2,3,4,6,8,9,10,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C216.1	3	2	2	2	-	2	-	2	2	2		1	2	2
C216.2	3	2	2	2	-	2	-	2	2	2		1	2	2
C216.3	3	2	2	2	-	2	-	2	2	2		1	2	2
C216.4	3	2	2	2	-	2	-	2	2	2		1	2	2
C216.5	3	2	2	2	-	2	-	2	2	2		1	2	2
C216.6	3	2	2	2	-	2	-	2	2	2		1	2	2
C216	3	2	2	2	-	2	-	2	2	2		1	2	2

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C217 - CE8461 HYDRAULIC ENGINEERING LABORATORY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C217.1	Examine the measurement of flow	1,2,3,4,5,6,8,9,10,12	1,2
C217.2	Explain the flow rate in venturimeter.	1,2,3,4,5,6,8,9,10,12	1,2
C217.3	Measure flow in pipes and determine frictional losses.	1,2,3,4,5,6,8,9,10,12	1,2
C217.4	Compare the characteristics of pumps.	1,2,3,4,5,6,8,9,10,12	1,2
C217.5	Illustrate the Characteristics of turbine.	1,2,3,4,5,6,8,9,10,12	1,2
C217.6	Determine Metacentric height of floating bodies	1,2,3,4,5,6,8,9,10,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C217.1	3	2	2	2	3	2	-	3	3	3		1	2	2
C217.2	3	2	2	2	3	2	-	3	3	3		1	2	2
C217.3	3	2	2	2	3	2	-	3	3	3		1	2	2
C217.4	3	2	2	2	3	2	-	3	3	3		1	2	2
C217.5	3	2	2	2	3	2	-	3	3	3		1	2	2
C217.6	3	2	2	2	3	2	-	3	3	3		1	2	2
C217	3	2	2	2	3	2	-	3	3	3		1	2	2

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SEMESTER-V

C301- CE8501 DESIGN OF REINFORCED CEMENT CONCRETE ELEMENTS

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C301.1	Analyze the various design methodologies for the design of RC elements.	1,2,3,4,8,10,11,12	1,2
C301.2	Distinguish the analysis and design of beams by limit state method.	1,2,3,4,8,10,11,12	1,2
C301.3	Design the various types of slabs and staircase by limit state method.	1,2,3,4,8,10,11,12	1,2
C301.4	Design of columns for axial, uniaxial and biaxial eccentric loadings.	1,2,3,4,8,10,11,12	1,2
C301.5	Design of footings by limit state method.	1,2,3,4,8,10,11,12	1,2
C301.6	Apply on design of reinforced cement concrete elements.	1,2,3,4,8,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C301.1	3	2	2	2	-	-	-	2	-	2	1	1	2	2
C301.2	3	2	2	2	-	-	-	2	-	2	1	1	2	2
C301.3	3	2	2	2	-	-	-	2	-	2	1	1	2	2
C301.4	3	2	2	2	-	-	-	2	-	2	1	1	2	2
C301.5	3	2	2	2	-	-	-	2	-	2	1	1	2	2
C301.6	3	2	2	2	-	-	-	2	-	2	1	1	2	2
C301	3	2	2	2	-	-	-	2	-	2	1	1	2	2

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C302-CE8502 STRUCTURAL ANALYSIS I

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C302.1	Analyze continuous beams, pin-jointed indeterminate plane frames and rigid plane frames by strain energy method	1,2,3,4,10,11,12	1,2
C302.2	Analyze the continuous beams and rigid frames by slope defection method	1,2,3,4,10,11,12	1,2
C302.3	Explain the concept of moment distribution and analysis of continuous beams and rigid frames with and without sway.	1,2,3,4,10,11,12	1,2
C302.4	Analyze the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method.	1,2,3,4,10,11,12	1,2
C302.5	Illustrate the concept of matrix stiffness method and analysis of continuous beams, pin jointed trusses and rigid plane frames.	1,2,3,4,10,11,12	1,2
C302.6	Discuss knowledge on analysis of beams and frames.	1,2,3,4,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C302.1	3	3	2	2	-	-	-	-	-	2	1	2	2	2
C302.2	3	3	2	2	-	-	-	-	-	2	1	2	2	2
C302.3	3	3	2	2	-	-	-	-	-	2	1	2	2	2
C302.4	3	3	2	2	-	-	-	-	-	2	1	2	2	2
C302.5	3	3	2	2	-	-	-	-	-	2	1	2	2	2
C302.6	3	3	2	2	-	-	-	-	-	2	1	2	2	2
C302	3	3	2	2	-	-	-	-	-	2	1	2	2	2

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C303 - EN8491 WATER SUPPLY ENGINEERING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C303.1	Illustrate the identification of sources and characteristics of water.	1,2,3,4,6,7,10,11,12	1,2
C303.2	Discuss the collection and conveyance of water supply system.	1,2,3,4,6,7,10,11,12	1,2
C303.3	Design the various functional units in water treatment.	1,2,3,4,6,7,10,11,12	1,2
C303.4	Design the various functional units in advanced water treatment.	1,2,3,4,6,7,10,11,12	1,2
C303.5	Analysis and design of distribution networks for a water supply system.	1,2,3,4,6,7,10,11,12	1,2
C303.6	Design and evaluate water supply project alternatives on basis of chosen criteria.	1,2,3,4,6,7,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C303.1	3	2	1	1	-	3	2	-	-	3	1	1	2	2
C303.2	3	2	1	1	-	3	2	-	-	3	1	1	2	2
C303.3	3	2	1	1	-	3	2	-	-	3	1	1	2	2
C303.4	3	2	1	1	-	3	2	-	-	3	1	1	2	2
C303.5	3	2	1	1	-	3	2	-	-	3	1	1	2	2
C303.6	3	2	1	1	-	3	2	-	-	3	1	1	2	2
C303	3	2	1	1	-	3	2	-	-	3	1	1	2	2

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C304-CE8591 FOUNDATION ENGINEERING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C304.1	Identify the soil investigation for Civil Engineering construction	1,2,3,4,9,10,11,12	1,2
C304.2	Explain the bearing capacity of soils	1,2,3,4,9,10,11,12	1,2
C304.3	Analyze and design the shallow foundation.	1,2,3,4,9,10,11,12	1,2
C304.4	Analyze and design the deep foundation.	1,2,3,4,6,8,9,10,11,12	1,2
C304.5	Analyze and design the earth retaining structures for any kind of soil medium	1,2,3,4,6,8,9,10,11,12	1,2
C304.6	Discuss the site investigation and will be able to design various types of footing.	1,2,3,4,9,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C304.1	3	3	2	2	-	-	-	-	3	2	1	1	2	2
C304.2	3	3	2	2	-	-	-	-	3	2	1	1	2	2
C304.3	3	3	2	2	-	-	-	-	3	2	1	1	2	2
C304.4	3	3	2	2	-	3	-	2	3	2	1	1	2	2
C304.5	3	3	2	2	-	3	-	2	3	2	1	1	2	2
C304.6	3	3	2	2	-	-	-	-	3	2	1	1	2	2
C304	3	3	2	2	-	3	-	2	3	2	1	1	2	2

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C305 -GI8011 DISASTER MANAGEMENT

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C305.1	Discuss the types of disasters, causes and their impact on environment and society	1,2,3,4,6,7,10,11,12	1,2
C305.2	Assess vulnerability and various methods of risk reduction, Institutional framework and mitigation.	1,2,3,4,6,7,9,10,11,12	1,2
C305.3	Identify the hazard, impact of developments, Climate change associated disaster.	1,2,3,4,6,7,10,11,12	1,2
C305.4	Express disaster risk management by understanding Disaster Relief, GIS/Information Technology and Disaster Management Act.	1,2,3,4,5,6,7,8,9,10,11,12	1,2
C305.5	Construct Hazard Zonation map, Vulnerability Assessment, Drought Assessment, Storm Surge Assessment report and perform field works related to disaster management.	1,2,3,4,5,6,7,8,9,10,11,12	1,2
C305.6	Develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity	1,2,3,4,6,7,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C305.1	3	3	2	1	-	2	2	-	-	2	1	1	2	2
C305.2	3	3	2	1	-	2	2	-	1	2	1	1	2	2
C305.3	3	3	2	1	-	2	2	-	-	2	1	1	2	2
C305.4	3	3	2	1	1	2	2	1	1	2	1	1	2	2
C305.5	3	3	2	1	1	2	2	1	1	2	1	1	2	2
C305.6	3	3	2	1	-	2	2	-	-	2	1	1	2	2
C305	3	3	2	1	1	2	2	1	1	2	1	1	2	2

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C306 - ORO551 RENEWABLE ENERGY SOURCES

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C306.1	Illustrate of the principles of solar radiation.	1,2,3,4,10,11,12	1,2
C306.2	Classify the solar energy collectors and methodologies of storing solar energy.	1,2,3,4,10,11,12	1,2
C306.3	Explain about application of solar energy in a useful way.	1,2,3,4,10,11,12	1,2
C306.4	Discuss about wind energy and biomass with its economic aspects.	1,2,3,4,10,11,12	1,2
C306.5	Apply other forms of energy sources like wind, biogas and geothermal energies in real time.	1,2,3,4,10,11,12	1,2
C306.6	Discuss the possible ways of utilizing renewable energy for the day to day life.	1,2,3,4,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C306.1	3	2	2	1	-	-	-	-	-	2	1	1	2	2
C306.2	3	2	2	1	-	-	-	-	-	2	1	1	2	2
C306.3	3	2	2	1	-	-	-	-	-	2	1	1	2	2
C306.4	3	2	2	1	-	-	-	-	-	2	1	1	2	2
C306.5	3	2	2	1	-	-	-	-	-	2	1	1	2	2
C306.6	3	2	2	1	-	-	-	-	-	2	1	1	2	2
C306	3	2	2	1	-	-	-	-	-	2	1	1	2	2

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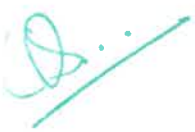
C307 - CE8511 SOIL MECHANICS LABORATORY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C307.1	Conduct tests to determine index properties of soils.	1,2,3,4,5,6,8,9,10,11,12	1,2
C307.2	Conduct tests to determine in situ density and compaction characteristic of soil.	1,2,3,4,5,6,8,9,10,11,12	1,2
C307.3	Demonstrate the shear strength.	1,2,3,4,5,6,8,9,10,11,12	1,2
C307.4	Discuss about the compressibility.	1,2,3,4,5,6,8,9,10,11,12	1,2
C307.5	Explain about the permeability by conducting appropriate tests.	1,2,3,4,5,6,8,9,10,11,12	1,2
C307.6	Conduct tests to determine Engineering properties of soil.	1,2,3,4,5,6,8,9,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C307.1	3	2	2	2	3	3	-	2	3	2	1	2	2	2
C307.2	3	2	2	2	3	3	-	2	3	2	1	2	2	2
C307.3	3	2	2	2	3	3	-	2	3	2	1	2	2	2
C307.4	3	2	2	2	3	3	-	2	3	2	1	2	2	2
C307.5	3	2	2	2	3	3	-	2	3	2	1	2	2	2
C307.6	3	2	2	2	3	3	-	2	3	2	1	2	2	2
C307	3	2	2	2	3	3	-	2	3	2	1	2	2	2



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C308 - CE8512 WATER AND WASTE WATER ANALYSIS LABORATORY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C308.1	Quantify the characteristics of water and wastewater.	1,2,3,4,5,6,7,9,10,11,12	1,2
C308.2	Conduct tests to determine Chemical dosage test.	1,2,3,4,5,6,7,9,10,11,12	1,2
C308.3	Conduct tests to determine Chloride and residual test.	1,2,3,4,5,6,7,9,10,11,12	1,2
C308.4	Determine the amount of COD and COD present in the sample	1,2,3,4,5,6,7,9,10,11,12	1,2
C308.5	Estimate the amount of pollutant present in the waste water.	1,2,3,4,5,6,7,9,10,11,12	1,2
C308.6	Examine the conditions for the growth of micro-organisms	1,2,3,4,5,6,7,9,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C308.1	2	1	1	1	3	2	2	-	3	3	1	1	2	2
C308.2	2	1	1	1	3	2	2	-	3	3	1	1	2	2
C308.3	2	1	1	1	3	2	2	-	3	3	1	1	2	2
C308.4	2	1	1	1	3	2	2	-	3	3	1	1	2	2
C308.5	2	1	1	1	3	2	2	-	3	3	1	1	2	2
C308.6	2	1	1	1	3	2	2	-	3	3	1	1	2	2
C308	2	1	1	1	3	2	2	-	3	3	1	1	2	2

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C309 - CE8513 SURVEY CAMP

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C309.1	Explain about the total station for surveying.	1,2,3,4,5,6,8,9,10,11,12	1,2
C309.2	Prepare contour maps and Curve setting	1,2,3,4,5,6,8,9,10,11,12	1,2
C309.3	Prepare building offsets and plotting the location.	1,2,3,4,5,6,8,9,10,11,12	1,2
C309.4	Demonstrate and handle survey instruments like theodolite.	1,2,3,4,5,6,8,9,10,11,12	1,2
C309.5	Demonstrate about the tachometry and total station.	1,2,3,4,5,6,8,9,10,11,12	1,2
C309.6	Determine the azimuth& Prepare topographical map on an area using GPS	1,2,3,4,5,6,8,9,10,11,12	1,2

Mapping of COs, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C309.1	2	2	1	1	2	2	-	3	3	2	1	1	2	2
C309.2	2	2	1	1	2	2	-	3	3	2	1	1	2	2
C309.3	2	2	1	1	2	2	-	3	3	2	1	1	2	2
C309.4	2	2	1	1	2	2	-	3	3	2	1	1	2	2
C309.5	2	2	1	1	2	2	-	3	3	2	1	1	2	2
C309.6	2	2	1	1	2	2	-	3	3	2	1	1	2	2
C309	2	2	1	1	2	2	-	3	3	2	1	1	2	2

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SEMESTER VI

C310 - CE8601 DESIGN OF STEEL STRUCTURAL ELEMENTS

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C310.1	Explain the concepts of various design philosophies	1,2,3,4,10,11,12	1,2
C310.2	Design of common bolted and welded connections for steel structures	1,2,3,4,10,11,12	1,2
C.310.3	Design of tension members and understand the effect of shear lag.	1,2,3,4,10,11,12	1,2
C310.4	Design of axially loaded columns and column base connections.	1,2,3,4,10,11,12	1,2
C310.5	Illustrate specific problems related to the design of laterally restrained and unrestrained steel beams.	1,2,3,4,10,11,12	1,2
C310.6	Design of steel structural elements and connections.	1,2,3,4,10,11,12	1,2

Mapping of COs, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C310.1	3	3	3	2	-	-	-	-	-	2	1	2	2	2
C310.2	3	3	3	2	-	-	-	-	-	2	1	2	2	2
C.310.3	3	3	3	2	-	-	-	-	-	2	1	2	2	2
C310.4	3	3	3	2	-	-	-	-	-	2	1	2	2	2
C310.5	3	3	3	2	-	-	-	-	-	2	1	2	2	2
C310.6	3	3	3	2	-	-	-	-	-	2	1	2	2	2
C310	3	3	3	2	-	-	-	-	-	2	1	2	2	2

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C311 - CE8602 STRUCTURAL ANALYSIS II

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C311.1	Draw influence lines for statically determinate structures.	1,2,3,4,10,11,12	1,2
C311.2	Describe Muller Breslau's principle and draw the influence lines for statically indeterminate beams.	1,2,3,4,10,11,12	1,2
C311.3	Analyze the different types of arches.	1,2,3,4,10,11,12	1,2
C311.4	Analyze the cables and suspension bridges.	1,2,3,4,10,11,12	1,2
C311.5	Convert the concept of Plastic analysis for beams and frames.	1,2,3,4,10,11,12	1,2
C311.6	Analyze the beams, frames, arches, cables and suspension bridges.	1,2,3,4,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C311.1	3	3	3	3	-	-	-	-	-	2	1	2	2	2
C311.2	3	3	3	3	-	-	-	-	-	2	1	2	2	2
C311.3	3	3	3	3	-	-	-	-	-	2	1	2	2	2
C311.4	3	3	3	3	-	-	-	-	-	2	1	2	2	2
C311.5	3	3	3	3	-	-	-	-	-	2	1	2	2	2
C311.6	3	3	3	3	-	-	-	-	-	2	1	2	2	2
C311	3	3	3	3	-	-	-	-	-	2	1	2	2	2

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C312 - CE8603 IRRIGATION ENGINEERING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C312.1	Discuss the skills on crop water requirements.	1,2,3,4,6,7,10,11,12	1,2
C312.2	Classify the methods and management of irrigation	1,2,3,4,6,7,10,11,12	1,2
C312.3	Demonstrate knowledge on types of Impounding structures	1,2,3,4,6,7,10,11,12	1,2
C312.4	Explain methods of irrigation including canal irrigation.	1,2,3,4,6,7,10,11,12	1,2
C312.5	Demonstrate knowledge on water management on optimization of water use.	1,2,3,4,6,7,10,11,12	1,2
C312.6	Illustrate the different phases of irrigation management.	1,2,3,4,6,7,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C312.1	2	2	1	1	-	2	2	-	-	2	1	2	2	2
C312.2	2	2	1	1	-	2	2	-	-	2	1	2	2	2
C312.3	2	2	1	1	-	2	2	-	-	2	1	2	2	2
C312.4	2	2	1	1	-	2	2	-	-	2	1	2	2	2
C312.5	2	2	1	1	-	2	2	-	-	2	1	2	2	2
C312.6	2	2	1	1	-	2	2	-	-	2	1	2	2	2
C312	2	2	1	1	-	2	2	-	-	2	1	2	2	2

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C313 - CE8604 HIGHWAY ENGINEERING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C313.1	Examine knowledge on planning and aligning of highway	1,2,3,4,10,11,12	1,2
C313.2	Discuss the geometric design of highways	1,2,3,4,10,11,12	1,2
C313.3	Design of flexible and rigid pavements.	1,2,3,4,10,11,12	1,2
C313.4	Estimate knowledge on Highway construction materials and practice.	1,2,3,4,10,11,12	1,2
C313.5	Discuss the concept of pavement management system, evaluation of distress and maintenance of pavements.	1,2,3,4,10,11,12	1,2
C313.6	Illustrate the planning, design, construction and maintenance of highways as per IRC standards.	1,2,3,4,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C313.1	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C313.2	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C313.3	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C313.4	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C313.5	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C313.6	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C313	3	2	1	1	-	-	-	-	-	2	1	1	2	2

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C314 - EN8592 WASTEWATER ENGINEERING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C314.1	Demonstrate the estimation of sanitary sewage and storm runoff.	1,2,3,4,10,11,12	1,2
C314.2	Describe the design primary treatment units.	1,2,3,4,10,11,12	1,2
C314.3	Prepare the design Secondary treatment units.	1,2,3,4,10,11,12	1,2
C314.4	Discriminate the standard methods for disposal of sewage	1,2,3,4,10,11,12	1,2
C314.5	Differentiate knowledge on sludge treatment and disposal	1,2,3,4,10,11,12	1,2
C314.6	Apply knowledge on design, operation and maintenance of sewage treatment plant.	1,2,3,4,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C314.1	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C314.2	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C314.3	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C314.4	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C314.5	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C314.6	3	2	1	1	-	-	-	-	-	2	1	1	2	2
C314	3	2	1	1	-	-	-	-	-	2	1	1	2	2

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C315 - CE8004 URBAN PLANNING AND DEVELOPMENT

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C315.1	Describe basic issues in urban planning	1,2,3,4,10,11,12	1,2
C315.2	Formulate plans for urban and rural development	1,2,3,4,10,11,12	1,2
C315.3	Summarize knowledge to develop and formulation of urban plans.	1,2,3,4,10,11,12	1,2
C315.4	Design of urban development projects	1,2,3,4,10,11,12	1,2
C315.5	Manage urban development projects.	1,2,3,4,10,11,12	1,2
C315.6	Explain the regulations and laws related to urban planning.	1,2,3,4,10,11,12	1,2

Mapping of COs, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C315.1	3	3	2	1	-	-	-	-	-	2	1	1	2	2
C315.2	3	3	2	1	-	-	-	-	-	2	1	1	2	2
C315.3	3	3	2	1	-	-	-	-	-	2	1	1	2	2
C315.4	3	3	2	1	-	-	-	-	-	2	1	1	2	2
C315.5	3	3	2	1	-	-	-	-	-	2	1	1	2	2
C315.6	3	3	2	1	-	-	-	-	-	2	1	1	2	2
C315	3	3	2	1	-	-	-	-	-	2	1	1	2	2

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C316 - CE8611 HIGHWAY ENGINEERING LABORATORY

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C316.1	Demonstrate the test on aggregates	1,2,3,4,8,9,10,11,12	1,2
C316.2	Experiment the test on bitumen	1,2,3,4,8,9,10,11,12	1,2
C316.3	Summarize about tests on bituminous mixes	1,2,3,4,8,9,10,11,12	1,2
C316.4	Evaluate skid resistance tester/ benkelmen beam method	1,2,3,4,8,9,10,11,12	1,2
C316.5	Practice the usage of bitumen as pavement material in the highway engineering field	1,2,3,4,8,9,10,11,12	1,2
C316.6	Discuss the principles and procedures of testing on aggregate	1,2,3,4,8,9,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C316.1	3	3	3	3	-	-	-	3	3	2	1	1	2	2
C316.2	3	3	3	3	-	-	-	3	3	2	1	1	2	2
C316.3	3	3	3	3	-	-	-	3	3	2	1	1	2	2
C316.4	3	3	3	3	-	-	-	3	3	2	1	1	2	2
C316.5	3	3	3	3	-	-	-	3	3	2	1	1	2	2
C316.6	3	3	3	3	-	-	-	3	3	2	1	1	2	2
C316	3	3	3	3	-	-	-	3	3	2	1	1	2	2

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C317 - CE8612 IRRIGATION AND ENVIRONMENTAL ENGINEERING DRAWING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C317.1	Design and tank and its components	1,2,3,4,7,8,9,10,11,12	1,2
C317.2	Design and draw earth dam and profile of Gravity Dam.	1,2,3,4,7,8,9,10,11,12	1,2
C317.3	Design and draw water supply and treatment units Canal regulation structures	1,2,3,4,7,8,9,10,11,12	1,2
C317.4	Design and Draw Various units of sewage treatment plants	1,2,3,4,7,8,9,10,11,12	1,2
C317.5	Design and draw Cross drainage works, Canal regulation structures.	1,2,3,4,7,8,9,10,11,12	1,2
C317.6	Design and draw Canal regulation structures.	1,2,3,4,7,8,9,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C317.1	2	2	2	1	-	-	1	3	3	3	1	1	2	2
C317.2	2	2	2	1	-	-	1	3	3	3	1	1	2	2
C317.3	2	2	2	1	-	-	1	3	3	3	1	1	2	2
C317.4	2	2	2	1	-	-	1	3	3	3	1	1	2	2
C317.5	2	2	2	1	-	-	1	3	3	3	1	1	2	2
C317.6	2	2	2	1	-	-	1	3	3	3	1	1	2	2
C317	2	2	2	1	-	-	1	3	3	3	1	1	2	2

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SEMESTER-VII

C401 - CE8701 ESTIMATION, COSTING AND VALUATION ENGINEERING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C401.1	Estimate the quantities for buildings and other structures.	1,2,3,4,10,11,12	1,2
C401.2	Analysis the rate and cost estimate for building works, canals, and Roads.	1,2,3,4,10,11,12	1,2
C401.3	Explain types of specifications, principles for report preparation, tender notices types.	1,2,3,4,10,11,12	1,2
C401.4	Illustrate knowledge on types of contracts.	1,2,3,4,10,11,12	1,2
C401.5	Evaluate valuation for building and land.	1,2,3,4,10,11,12	1,2
C401.6	Explain cost estimation and valuation for various projects.	1,2,3,4,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C401.1	3	3	2	1	-	-	-	-	-	2	1	1	2	2
C401.2	3	3	2	1	-	-	-	-	-	2	1	1	2	2
C401.3	3	3	2	1	-	-	-	-	-	2	1	1	2	2
C401.4	3	3	2	1	-	-	-	-	-	2	1	1	2	2
C401.5	3	3	2	1	-	-	-	-	-	2	1	1	2	2
C401.6	3	3	2	1	-	-	-	-	-	2	1	1	2	2
C401	3	3	2	1	-	-	-	-	-	2	1	1	2	2

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C402 - CE8702 RAILWAYS, AIRPORTS, DOCKS AND HARBOUR ENGINEERING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C402.1	Estimate the methods of route alignment and design elements in Railway Planning and Constructions.	1,2,3,4,10,11,12	1,2
C402.2	Demonstrate the Construction techniques and Maintenance of Track laying and Railway stations.	1,2,3,4,10,11,12	1,2
C402.3	Elaborate an insight on the planning and site selection of Airport Planning and design.	1,2,3,4,10,11,12	1,2
C402.4	Analyze and design the elements for orientation of runways and passenger facility systems.	1,2,3,4,10,11,12	1,2
C402.5	Demonstrate the various features in Harbours and Ports, their construction, coastal Protection works and coastal Regulations to be adopted.	1,2,3,4,10,11,12	1,2
C402.6	Explain knowledge on railways, airports, docks and harbour Engineering.	1,2,3,4,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C402.1	2	1	1	1	-	-	-	-	-	1	1	1	2	2
C402.2	2	1	1	1	-	-	-	-	-	1	1	1	2	2
C402.3	2	1	1	1	-	-	-	-	-	1	1	1	2	2
C402.4	2	1	1	1	-	-	-	-	-	1	1	1	2	2
C402.5	2	1	1	1	-	-	-	-	-	1	1	1	2	2
C402.6	2	1	1	1	-	-	-	-	-	1	1	1	2	2
C402	2	1	1	1	-	-	-	-	-	1	1	1	2	2

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C403 CE8703 STRUCTURAL DESIGN AND DRAWING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C403.1	Design and draw the detailing for reinforced concrete cantilever and counterfort retaining walls	1,2,3,4,6,8,9,10,11,12	1,2
C403.2	Design and draw the detailing for flat slab as per code provisions	1,2,3,4,6,8,9,10,11,12	1,2
C403.3	Design and draw the detailing for reinforced concrete and steel bridges	1,2,3,4,6,8,9,10,11,12	1,2
C403.4	Design and draw the detailing for reinforced concrete and steel water tanks	1,2,3,4,6,8,9,10,11,12	1,2
C403.5	Design and draw the detailing for the various steel trusses and gantry girders.	1,2,3,4,6,8,9,10,11,12	1,2
C403.6	Design and detail the RCC and steel structures	1,2,3,4,6,8,9,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C403.1	3	3	3	2	-	1	-	2	2	2	1	1	2	2
C403.2	3	3	3	2	-	1	-	2	2	2	1	1	2	2
C403.3	3	3	3	2	-	1	-	2	2	2	1	1	2	2
C403.4	3	3	3	2	-	1	-	2	2	2	1	1	2	2
C403.5	3	3	3	2	-	1	-	2	2	2	1	1	2	2
C403.6	3	3	3	2	-	1	-	2	2	2	1	1	2	2
C403	3	3	3	2	-	1	-	2	2	2	1	1	2	2

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C 404 -EN8591 MUNICIPAL SOLID WASTE MANAGEMENT

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C404.1	Explain the nature and characteristics of municipal solid wastes and the regulatory requirements regarding municipal solid waste management.	1,2,3,4,7,10,11,12	1,2
C404.2	Elaborate about reduction, reuse and recycling of waste.	1,2,3,4,7,10,11,12	1,2
C404.3	Design systems for storage, collection, transport, processing and disposal of municipal solid waste.	1,2,3,4,7,10,11,12	1,2
C404.4	Apply knowledge on the issues on solid waste management from an integrated and holistic perspective, as well as in the local and international context.	1,2,3,4,7,10,11,12	1,2
C404.5	Design and operation of sanitary landfill	1,2,3,4,7,10,11,12	1,2
C404.6	Illustrate about solid waste management and will be able to find new solutions to the waste disposal.	1,2,3,4,7,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C404.1	3	3	2	1	-	-	2	-	-	2	1	1	2	2
C404.2	3	3	2	1	-	-	2	-	-	2	1	1	2	2
C404.3	3	3	2	1	-	-	2	-	-	2	1	1	2	2
C404.4	3	3	2	1	-	-	2	-	-	2	1	1	2	2
C404.5	3	3	2	1	-	-	2	-	-	2	1	1	2	2
C404.6	3	3	2	1	-	-	2	-	-	2	1	1	2	2
C404	3	3	2	1	-	-	2	-	-	2	1	1	2	2

C405 -OEN751 GREEN BUILDING DESIGN

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C405.1	Demonstrate the environmental implications of buildings energy.	1,2,3,4,10,11,12	1,2
C405.2	Distinguish knowledge on implications of building technologies embodied energy of building.	1,2,3,4,10,11,12	1,2
C405.3	Demonstrate on providing comforts in building	1,2,3,4,10,11,12	1,2
C405.4	Discuss on utility of solar energy in buildings	1,2,3,4,10,11,12	1,2
C405.5	Describe about green composites for buildings.	1,2,3,4,10,11,12	1,2
C405.6	Design green buildings in their future endeavor.	1,2,3,4,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C405.1	3	1	1	1	-	-	-	-	-	2	1	1	2	2
C405.2	3	1	1	1	-	-	-	-	-	2	1	1	2	2
C405.3	3	1	1	1	-	-	-	-	-	2	1	1	2	2
C405.4	3	1	1	1	-	-	-	-	-	2	1	1	2	2
C405.5	3	1	1	1	-	-	-	-	-	2	1	1	2	2
C405.6	3	1	1	1	-	-	-	-	-	2	1	1	2	2
C405	3	1	1	1	-	-	-	-	-	2	1	1	2	2

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C406 CE8711 CREATIVE AND INNOVATIVE PROJECT

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C406.1	Examine any practical problems and find solution by formulating proper methodology.	1,2,3,4,5,7,8,9,10,11,12	1,2
C406.2	Identify skills for solving the specific problems.	1,2,3,4,5,7,8,9,10,11,12	1,2
C406.3	Develop skills in project writing and presentation.	1,2,3,4,5,7,8,9,10,11,12	1,2
C406.4	Conclude solutions for the identified problem.	1,2,3,4,5,7,8,9,10,11,12	1,2
C406.5	Discuss with team members in a professional and ethical manner, respecting differences, to ensure a collaborative project environment	1,2,3,4,5,7,8,9,10,11,12	1,2
C406.6	Communicate effectively to present ideas clearly and coherently both in the written and oral forms	1,2,3,4,5,7,8,9,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C406.1	3	3	2	2	2	-	1	1	3	2	1	1	2	2
C406.2	3	3	2	2	2	-	1	1	3	2	1	1	2	2
C406.3	3	3	2	2	2	-	1	1	3	2	1	1	2	2
C406.4	3	3	2	2	2	-	1	1	3	2	1	1	2	2
C406.5	3	3	2	2	2	-	1	1	3	2	1	1	2	2
C406.6	3	3	2	2	2	-	1	1	3	2	1	1	2	2
C406	3	3	2	2	2	-	1	1	3	2	1	1	2	2

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C407 CE8712 INDUSTRIAL TRAINING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C407.1	Express knowledge of practical problems in carrying out engineering tasks.	1-12	1,2
C407.2	Express the intricacies of implementation textbook knowledge into practice	1-12	1,2
C407.3	Recognize the concepts of developments and implementation of new techniques.	1-12	1,2
C407.4	Develop skills in facing and solving the field problems	1-12	1,2
C407.5	Develop awareness about general workplace behavior and build	1-12	1,2
C407.6	Prepare professional work report and presentations.	1-12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C407.1	2	2	1	1	2	1	1	2	2	2	1	2	2	2
C407.2	2	2	1	1	2	1	1	2	2	2	1	2	2	2
C407.3	2	2	1	1	2	1	1	2	2	2	1	2	2	2
C407.4	2	2	1	1	2	1	1	2	2	2	1	2	2	2
C407.5	2	2	1	1	2	1	1	2	2	2	1	2	2	2
C407.6	2	2	1	1	2	1	1	2	2	2	1	2	2	2
C407	2	2	1	1	2	1	1	2	2	2	1	2	2	2

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SEMESTER -VIII

C408 - GE8076 PROFESSIONAL ETHICS IN ENGINEERING

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C408.1	Discuss insight on human values	1,2,3,4,6,8,10,11,12	1,2
C408.2	Develop knowledge on engineering ethics	1,2,3,4,6,8,10,11,12	1,2
C408.3	Illustrate familiar with Codes of Ethics	1,2,3,4,6,8,10,11,12	1,2
C408.4	Paraphrase on assessment of safety, professional rights and responsibilities.	1,2,3,4,6,8,10,11,12	1,2
C408.5	Illustrate unawareness on global issues due to ethical misuses	1,2,3,4,6,8,10,11,12	1,2
C408.6	Apply professional ethics in Engineering.	1,2,3,4,6,8,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C408.1	3	2	2	1	-	2	-	3	-	2	1	1	2	2
C408.2	3	2	2	1	-	2	-	3	-	2	1	1	2	2
C408.3	3	2	2	1	-	2	-	3	-	2	1	1	2	2
C408.4	3	2	2	1	-	2	-	3	-	2	1	1	2	2
C408.5	3	2	2	1	-	2	-	3	-	2	1	1	2	2
C408.6	3	2	2	1	-	2	-	3	-	2	1	1	2	2
C408	3	2	2	1	-	2	-	3	-	2	1	1	2	2

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C409 - CE8020 MAINTENANCE, REPAIR AND REHABILITATION OF STRUCTURES

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C409.1	Explain the importance of maintenance and assessment method of distressed structures.	1,2,3,4,6,7,10,11,12	1,2
C409.2	Describe the strength and durability properties, their effects due to climate and temperature.	1,2,3,4,6,7,10,11,12	1,2
C409.3	Illustrate recent development in concrete	1,2,3,4,6,7,10,11,12	1,2
C409.4	Demonstrate the techniques for repair and protection methods	1,2,3,4,6,7,10,11,12	1,2
C409.5	Analyse repair, rehabilitation and retrofitting of structures and demolition methods	1,2,3,4,6,7,8,10,11,12	1,2
C409.6	Discuss on Quality of concrete, durability aspects, causes of deterioration,Assessment of distressed structures, repairing of structures and demolition procedures.	1,2,3,4,6,7,8,10,11,12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C409.1	2	2	2	1	-	1	2	-	-	2	1	1	2	2
C409.2	2	2	2	1	-	1	2	-	-	2	1	1	2	2
C409.3	2	2	2	1	-	1	2	-	-	2	1	1	2	2
C409.4	2	2	2	1	-	1	2	-	-	2	1	1	2	2
C409.5	2	2	2	1	-	1	2	1	-	2	1	1	2	2
C409.6	2	2	2	1	-	1	2	1	-	2	1	1	2	2
C409	2	2	2	1	-	1	2	1	-	2	1	1	2	2

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C410 :CE8811 PROJECT WORK

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
C410.1	Develop knowledge on current social problems and find solution by formulating proper method.	1 - 12	1,2
C410.2	Analyze and prepare literature review using research articles.	1 - 12	1,2
C410.3	Find a research gap in the field.	1 - 12	1,2
C410.4	Develop skills in preparing project reports and presentations.	1 - 12	1,2
C410.5	Identify and suggest future scope of work in the relevant field.	1 - 12	1,2
C410.6	Communicate effectively to present ideas clearly and coherently both in the written and oral forms.	1 - 12	1,2

Mapping of COs, C, PSOs with POs

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C410.1	3	3	3	2	3	2	2	2	3	2	1	1	2	2
C410.2	3	3	3	2	3	2	2	2	3	2	1	1	2	2
C410.3	3	3	3	2	3	2	2	2	3	2	1	1	2	2
C410.4	3	3	3	2	3	2	2	2	3	2	1	1	2	2
C410.5	3	3	3	2	3	2	2	2	3	2	1	1	2	2
C410.6	3	3	3	2	3	2	2	2	3	2	1	1	2	2
C410	3	3	3	2	3	2	2	2	3	2	1	1	2	2

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