

REGULATIONS 2017

**COURSE OUTCOME (CO) , PROGRAM OUTCOMES (PO),
PROGRAM SPECIFIC OUTCOMES (PSOs)**

B.E. – CIVIL ENGINEERING



EASWARI ENGINEERING COLLEGE

(Autonomous Institution)

BharathiSalai, Ramapuram, Chennai - 600 089

**[A Unit of SRM Group of Educational Institutions, Approved by AICTE | Affiliated to Anna University,
Chennai |NAAC Accredited 'A' Grade |
2(f) & 12(B) Status(UGC) | ISO 9001:2015 Certified | NBA Accredited Programmes | FIST Funded (DST) |
SIRO Certified (DSIR)]**

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

- PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2: 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.
- PO3: 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.
- PO4: 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.
- PO5: 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.
- PO6: 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.
- PO7: 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.
- PO8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9: Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10: 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.
- PO11: Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12: 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 (PSOs)

The student will be -

PSO1: Able to apply the engineering fundamentals to analyze and design the various structural components.

PSO2: Able to cater to the changing industrial needs and capable of developing green concepts for different applications.

PSO3: Able to understand the necessity of Civil Engineering solutions in a economical, Environmental and societal context.

CE 8301- STRENGTH OF MATERIALS I

COURSE OUTCOME: Upon completion of the course, the students will be able to

CE8301.1	Understand the concepts of stress strain and deformation of solids.
CE8301.2	Analyze the complex two dimensional stresses analytically and graphically.
CE8301.3	Determine shear force and bending moment in beams and understand concept of theory of simple bending.
CE8301.4	Calculate the deflection of beams by different methods and selection of method for determining slope or deflection.
CE8301.5	Apply basic equation of torsion in design of circular shafts and helical springs.
CE8301.6	Analyze the pin jointed plane and space trusses.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8301.1	3	2	2	1	-	-	-	-	1	-	-	-
CE8301.2	3	2	2	1	-	-	-	-	-	-	-	-
CE8301.3	3	3	3	2	-	-	-	-	1	-	-	-
CE8301.4	3	3	3	2	-	-	-	-	1	-	-	-
CE8301.5	3	2	3	2	-	-	-	-	1	-	-	-
CE8301.6	3	3	3	2	-	-	-	-	-	-	-	-
CE8301.	3	3	3	2	-	-	-	-	1	-	-	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8301.1	3	-	-
CE8301.2	3	-	-
CE8301.3	3	-	-
CE8301.4	3	-	-
CE8301.5	3	-	-
CE8301.6	3	-	-
CE8301.	3	-	-

CE 8302 - FLUID MECHANICS**COURSE OUTCOME:** The students will be able to

CE8302.1	Apply their knowledge of Engineering mechanics in addressing problems of Fluid Statics.
CE8302.2	Apply the concept of motion and forces causing motion in Fluid kinematics & Dynamics
CE8302.3	Apply and analyze the concept of Dimensional Analysis in real life situations.
CE8302.4	Apply the model analysis study to various machines and structures.
CE8302.5	Analyze the flow through pipes using the Concept of Darcy Weisbach equation and Hagen Poiseuille equation.
CE8302.6	Apply the concept of boundary layer to practical situations

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8302.1	3	2	1	1	-	-	-	-	1	-	-	-
CE8302.2	3	2	3	2	-	-	1	1	-	1	1	-
CE8302.3	3	2	2	2	-	-	1	2	-	1	1	-
CE8302.4	3	2	2	2	-	-	1	-	-	1	1	-
CE8302.5	3	2	1	2	-	-	1	-	-	-	-	-
CE8302.6	3	2	1	2	-	-	1	1	2	1	-	-
CE8302	3	2	3	2	-	-	1	2	2	1	1	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO PSO	PSO1	PSO2	PSO3
CE8302.1	2	1	-
CE8302.2	1	-	1
CE8302.3	1	-	-
CE8302.4	1	-	-
CE8302.5	1	1	-
CE8302.6	2	1	1
CE8302	2	1	1

CE8351 – SURVEYING

COURSE OUTCOME : The students completing the course will have

CE8531.1	The use of various surveying instruments and mapping
CE8531.2	Measuring Horizontal angle and vertical angle using different instruments
CE8531.3	Methods of Leveling and setting Levels with different instruments
CE8531.4	Concepts of astronomical surveying and methods to determine time, longitude, latitude and azimuth
CE8531.5	Concept and principle of modern surveying
CE8531.6	Work with advance methods of surveying like aerial photographs, cadastral surveying and cartographic surveying

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8531.1	3	1	-	1	-	-	-	1	-	1	-	-
CE8531.2	3	2	1	1	-	-	-	1	-	1	-	-
CE8531.3	3	2	2	1	-	-	-	1	-	1	-	-
CE8531.4	3	2	2	2	-	-	-	1	-	1	-	-
CE8531.5	3	2	3	2	-	-	-	1	-	1	-	-
CE8531.6	3	3	3	3	-	-	-	1	-	1	-	-
CE8351	3	3	3	3	-	-	-	1	-	1	-	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO PSO	PSO1	PSO2	PSO3
CE8531.1	2	-	-
CE8531.2	2	-	-
CE8531.3	2	-	-
CE8531.4	2	-	-
CE8531.5	2	-	1
CE8531.6	2	-	1
CE8351	2	-	1

CE 8391 - CONSTRUCTION MATERIALS**COURSE OUTCOME :**

CE8531.1	Ability to compare the properties of stones, bricks and concrete blocks.
CE8531.2	Understand the typical and potential applications of lime, cement and aggregates.
CE8531.3	Ability to understand the relationship between material properties and design a concrete mix
CE8531.4	Ability to compare the properties of timber and other construction materials.
CE8531.5	Ability to compare the properties of most common and advanced building materials.
CE8531.6	Understand the important features of material selection for construction.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8531.1	1	2	2	2	-	-	-	-	3	3	1	3
CE8531.2	1	2	2	2	-	-	-	-	3	3	1	3
CE8531.3	1	2	2	2	-	-	-	-	3	3	1	3
CE8531.4	1	2	2	2	-	-	-	-	3	3	1	3
CE8531.5	1	2	2	2	-	-	-	-	3	3	1	3
CE8531.6	1	2	2	2	-	-	-	-	3	3	1	3
CE8351	1	2	2	2	-	-	-	-	3	3	1	3

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO PSO	PSO1	PSO2	PSO3
CE8531.1	2	-	1
CE8531.2	2	-	1
CE8531.3	2	-	1
CE8531.4	2	-	1
CE8531.5	2	-	1
CE8531.6	2	-	1
CE8351	2	-	1

CE 8392 - ENGINEERING GEOLOGY**COURSE OUTCOMES**

CE 8392.1	Address the importance of geological knowledge such as earth, earthquake, weathering action of various geological agencies.
CE 8392.2	Apply knowledge about minerals and its properties in the civil engineering application.
CE 8392.3	Apply the knowledge about occurrence and engineering properties of various rocks in the construction which is more suitable.
CE 8392.4	To understand the concept of geological structure and their bearing capacity on engineering construction.
CE 8392.5	Apply the knowledge of geological consideration in projects such as dams, tunnels, bridges, roads, airport and harbor.
CE 8392.6	Students can address the types of geological rocks and stones used for a foundation which is adaptable and other related aspects.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8392.1	2	1	1	1	-	-	-	-	2	-	-	-
CE8392.2	1	1	1	1	-	-	-	-	1	-	2	-
CE8392.3	2	1	2	2	2	-	2	2	-	1	-	-
CE8392.4	2	2	2	2	-	-	2	1	-	2	1	-
CE8392.5	2	2	2	3	-	-	2	2	-	-	-	-
CE8392.6	2	2	2	3	-	-	2	2	-	-	-	-
CE8392	2.00	2.00	2.00	3.00	-	-	2.00	2.00	2.00	2.00	2.00	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8392.1	1	-	2
CE8392.2	-	-	1
CE8392.3	-	-	-
CE8392.4	-	-	-
CE8392.5	-	-	-
CE8392.6	-	-	1
CE8392	1	-	1

CE8311- CONSTRUCTION MATERIALS LABORATORY**COURSE OUTCOMES**

CE8311.1	Get a basic knowledge on tests on fresh concrete
CE8311.2	Gain the knowledge on tests on hardened concrete
CE8311.3	Get a basic knowledge on tests on aggregates
CE8311.4	Gain the knowledge on tests on bricks
CE8311.5	Gain the knowledge on tests on blocks
CE8311.6	Get a basic knowledge on tests on tiles

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8311.1	3	-	-	-	-	-	-	1	2	-	1	-
CE8311.2	3	-	-	-	-	-	-	1	2	-	1	-
CE8311.3	3	-	-	-	-	-	-	1	2	-	1	-
CE8311.4	3	-	-	-	-	-	-	1	2	-	1	-
CE8311.5	3	-	-	-	-	-	-	1	2	-	1	-
CE8311.5	3	-	-	-	-	-	-	1	2	-	1	-
CE8311	3	-	-	-	-	-	-	1	2	-	1	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8311.1	2	-	1
CE8311.2	2	-	1
CE8311.3	2	-	1
CE8311.4	2	-	1
CE8311.5	2	-	1
CE8311.5	2	-	1
CE8311	2	-	1

CE 8361 SURVEYING LABORATORY**COURSE OUTCOME:** The students will be able to

CE8361.1	Measure linear measurements using chain
CE8361.2	Obtain angular measurements using compass surveying
CE8361.3	Determine the reduced levels of earth surface using various leveling methods
CE8361.4	Determine the horizontal and vertical distances and angles using Theodolite.
CE8361.5	Determine tacheometric constants using Theodolite.
CE8361.6	Determine distances and difference in elevation using Total Station

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8361.1	3	2	1	2	-	1	2	3	3	1	-	3
CE8361.2	3	2	1	2	-	1	2	3	3	1	-	3
CE8361.3	3	2	1	2	-	1	2	3	3	1	-	3
CE8361.4	3	2	1	2	-	1	2	3	3	1	-	3
CE8361.5	3	2	1	2	-	1	2	3	3	1	-	3
CE8361.6	3	2	1	2	-	1	2	3	3	1	-	3
CE8361	3	2	1	2	-	1	2	3	3	1	-	3

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8361.1	2	-	2
CE8361.2	2	-	2
CE8361.3	2	-	2
CE8361.4	2	-	2
CE8361.5	2	-	2
CE8361.6	2	-	2
CE8361	2	-	2

CE 8401 - CONSTRUCTION TECHNIQUES & PRACTICES**COURSE OUTCOME :** Student will be able to

CE8401.1	know the different construction techniques and structural systems
CE8401.2	Understand various techniques and practices on masonry construction, flooring, and roofing.
CE8401.3	Plan the requirements for substructure construction.
CE8401.4	Know the methods and techniques involved in the construction of various types of super structures
CE8401.5	Select, maintain and operate hand and power tools and equipment used in the building construction sites.
CE8401.6	Know about various construction procedures from foundation to super structure.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8401.1	3	1	1	2	2	1	3	3		3	3	3
CE8401.2	3	1	3	2		1	3	3		3	3	1
CE8401.3	3	1	3	2		1	3	3		3	3	1
CE8401.4	3	1	3	2		1	3	3		3	3	1
CE8401.5	3	1	3	2		1	3	3		3	3	1
CE8401.6	3	1	3	2		1	3	3		3	3	1
CE8401	3	1	3	2		1	3	3		3	3	1

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8401.1	3	-	1
CE8401.2	3	-	1
CE8401.3	3	-	1
CE8401.4	3	-	1
CE8401.5	3	-	1
CE8401.6	3	-	1
CE8401	3	-	1

CE8404 CONCRETE TECHNOLOGY

COURSE OUTCOME: Upon completion of the course, the students will be able to

CE8404.1	Understand the properties of concrete and the role of ingredients like cement, aggregate, admixtures in concrete.
CE8404.2	Gain knowledge about the chemical and mineral admixtures.
CE8404.3	Proportion the concrete using various mix design concepts.
CE8404.4	Understand the testing procedures for workability and strength for fresh concrete
CE8404.5	Understand the testing procedures for strength and durability for hardened concrete
CE8404.6	Select appropriate type of concrete for specific requirements.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8404.1	2	-	-	-	2	-	-	-	-	3	1	3
CE8404.2	2	-	-	1	2	-	-	-	-	3	1	3
CE8404.3	2	-	-	-	2	-	-	-	-	3	1	3
CE8404.4	2	-	-	1	2	-	-	-	-	3	1	3
CE8404.5	2	-	-	1	2	-	-	-	-	3	1	3
CE8404.6	2	-	-	1	2	-	-	-	-	3	1	3
CE8404	2	-	-	1	2	-	-	-	-	3	1	3

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8404.1	3	1	3
CE8404.2	3	1	3
CE8404.3	3	1	3
CE8404.4	3	1	3
CE8404.5	3	1	3
CE8404.6	3	1	3
CE8404	3	1	3

CE 8402 - STRENGTH OF MATERIALS II

COURSE OUTCOME : Upon completion of the course, the students will be able to

CE 8402.1	Determine the strain energy and compute the deflection of determinate beams, frames and trusses using energy principles.
CE 8402.2	Analyse propped cantilever, fixed beams for external loadings and support settlements.
CE 8402.3	Analyse continuous beams using theorem of three moment equation for external loadings and support settlements
CE 8402.4	Find the load carrying capacity of columns and stresses induced in columns and cylinders
CE 8402.5	Determine principal stresses and planes for an element in three dimensional state of stress and study various theories of failure
CE 8402.6	Determine the stresses due to Unsymmetrical bending of beams, locate the shear centre, and find the stresses in curved beams.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE 8402.1	3	2	2	1	-	-	-	-	1	-	-	-
CE 8402.2	3	2	2	1	-	-	-	-	-	-	-	-
CE 8402.3	3	3	3	2	-	-	-	-	1	-	-	-
CE 8402.4	3	3	3	2	-	-	-	-	1	-	-	-
CE 8402.5	3	2	3	2	-	-	-	-	1	-	-	-
CE 8402.6	3	3	3	2	-	-	-	-	-	-	-	-
CE 8402	3	3	3	2	-	-	-	-	1	-	-	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PSO1	PSO2	PSO3
CE 8402.1	3	-	-
CE 8402.2	3	-	-
CE 8402.3	3	-	-
CE 8402.4	3	-	-
CE 8402.5	3	-	-
CE 8402.6	3	-	-
CE 8402	3	-	-

CE8491 SOIL MECHANICS

COURSE OUTCOME: Students will be able to

CE8491.1	Classify the soil and assess the engineering properties based on index properties
CE8491.2	Understand the stress concepts in soils
CE8491.3	Understand and identify the settlement in soils
CE8491.4	Determine the shear strength of soil
CE8491.5	Analyze both finite and infinite slopes and slope protection measures

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8491.1	3	3	2	3	-	-	2	2	-	-	2	-
CE8491.2	3	3	3	3	-	-	2	1	-	-	2	-
CE8491.3	3	3	3	3	-	-	2	2	-	-	-	-
CE8491.4	3	3	2	3	-	-	2	1	-	-	2	-
CE8491.5	3	3	2	3	-	-	2	2	-	-	2	-
CE8491.6	3	3	3	3	-	-	2	2	-	-	2	-
CE8491	3	3	3	3	-	-	2	2	-	-	2	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PSO1	PSO2	PSO3
CE8491.1	2	3	1
CE8491.2	2	2	1
CE8491.3	2	3	1
CE8491.4	2	3	1
CE8491.5	3	3	1
CE8491.6	2	3	1
CE8491	2	3	1

CE8403 - APPLIED HYDRAULIC ENGINEERING**COURSE OUTCOME:** Students will be able to

CE8403.1	Design best hydraulic sections in uniform flow
CE8403.2	Identify different surface profiles.
CE8403.3	Solve problems in uniform gradually varied flows in steady state conditions.
CE8403.4	Solve problems in rapidly varied flows in steady state conditions
CE8403.5	Design different turbines
CE8403.6	Design different pumps.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8403.1	3	3	2	2	1	1	1	2	1	2	3	1
CE8403.2	3	3	2	2	1	1	1	2	1	3	2	1
CE8403.3	3	3	2	2	1	1	1	3	1	2	3	1
CE8403.4	3	3	2	2	1	1	1	3	1	3	2	1
CE8403.5	3	3	2	2	1	1	1	2	1	2	3	1
CE8403.6	3	3	2	2	1	1	1	2	1	3	3	1
CE8403	3	3	2	2	1	1	1	2	1	3	3	1

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PSO1	PSO2	PSO3
CE8403.1	2	3	1
CE8403.2	2	2	1
CE8403.3	2	3	1
CE8403.4	2	3	1
CE8403.5	3	3	1
CE8403.6	2	3	1
CE8403	2	3	1

CE 8481 STRENGTH OF MATERIALS LABORATORY

COURSE OUTCOME: Students will be able to

CE 8481.1	Determine the strength of materials under externally applied loads.
CE 8481.2	Have a clear understanding of the design for strength and stiffness.
CE 8481.3	Learn fundamental concepts of Stress, Strain and deformation of solids with applications to bars and beams.
CE 8481.4	S know the mechanism of load transfer in beams, the induced stress resultants and deformations
CE 8481.5	Possess the ability to understand the effect of torsion on shafts
CE 8481.6	They will understand the properties of cement

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE 8481.1	1	2	3	4		5	6	7	8		9	10
CE 8481.2												
CE 8481.3												
CE 8481.4	3	2	3	-		2	-	-	-		2	-
CE 8481.5												
CE 8481.6												
CE 8481	3	2	3	1		2	-	-	-		2	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE 8481.1	3	-	1
CE 8481.2			
CE 8481.3	2	-	1
CE 8481.4			
CE 8481.5	3	-	1
CE 8481.6			
CE 8481	2	-	1

CE8461 HYDRAULIC ENGINEERING LABORATORY**Course Outcome:**

CE8461.1	The students will be able to measure flow (Discharge) in pipes
CE8461.2	The students will be able to measure flow (Discharge) in open channel
CE8461.3	The students will be able to verify the energy equation.
CE8461.4	The students will be able to determine energy loss due to friction and fittings
CE8461.5	The students will be able to study performance of pumps and its characteristic curve.
CE8461.6	The students will be able to study performance of pumps and its characteristic curve.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8461.1	3	3	3	3	-	2	1	1	3	1	-	-
CE8461.2	3	3	3	3	-	2	1	1	3	1	-	-
CE8461.3	3	3	3	3	-	2	1	1	3	1	-	-
CE8461.4	3	3	3	3	-	2	1	1	3	1	-	-
CE8461.5	3	3	3	3	-	2	1	1	3	1	-	-
CE8461.6	3	3	3	3	-	2	1	1	3	1	-	-
CE8461	3	3	3	3	-	2	1	1	3	1	-	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8461.1	1	-	3
CE8461.2	1	-	3
CE8461.3	1	-	3
CE8461.4	1	-	3
CE8461.5	1	-	3
CE8461.6	1	-	3
CE8461	1	-	3

CE8501- DESIGN OF REINFORCED CEMENT CONCRETE ELEMENTS

Course Outcome: Upon completion of the course, the students will be able to

CE8501.1	Understand the various design methodologies for the design of RC elements
CE8501.2	Know the analysis and design of flanged beams by limit state method and
CE8501.3	Know the design of beams for shear, bond and torsion.
CE8501.4	Design the various types of slabs and staircase by limit state method.
CE8501.5	Design columns for axial, uniaxial, biaxially eccentric loadings using Limit State Method as per codal requirements.
CE8501.6	Design of footing by limit state method.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8501.1	3	2	3	1	-	-	-	1	-	-	-	-
CE8501.2	3	3	3	1	-	-	-	1	1	-	-	-
CE8501.3	3	3	3	1	-	-	-	1	1	-	-	-
CE8501.4	3	3	3	1	-	-	-	1	1	-	-	-
CE8501.5	3	3	3	1	-	-	-	1	1	-	-	-
CE8501.6	3	3	3	1	-	-	-	1	1	-	-	-
CE8501	3	3	3	1	-	-	-	1	1	-	-	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8501.1	3	-	-
CE8501.2	3	-	-
CE8501.3	3	-	-
CE8501.4	3	-	-
CE8501.5	3	-	-
CE8501.6	3	-	-
CE8501	3	-	-

CE8502 - STRUCTURAL ANALYSIS I**Course Outcome:**

CE8502.1	Analyze the indeterminate frames using energy method
CE8502.2	Analyze the indeterminate structures using Slope deflection method
CE8502.3	Analyze the indeterminate structures using Moment distribution method
CE8502.4	Explain the concept of flexibility method and apply it for analysis of statically indeterminate Structures
CE8502.5	Explain the concept of stiffness methods and apply it for analysis of statically indeterminate Structures Apply various basic
CE8502.6	Analyze the indeterminate frames using energy method

Mapping of Course Outcome (CO) with Programme Outcome (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8502.1	3	3	3	3	-	2	1	1	3	1	-	-
CE8502.2	3	3	3	3	-	2	1	1	3	1	-	-
CE8502.3	3	3	3	3	-	2	1	1	3	1	-	-
CE8502.4	3	3	3	3	-	2	1	1	3	1	-	-
CE8502.5	3	3	3	3	-	2	1	1	3	1	-	-
CE8502.6	3	3	3	3	-	2	1	1	3	1	-	-
CE8502	3	3	3	3	-	2	1	1	3	1	-	-

Mapping of Course Outcome (CO) with Programme Specific Outcome (PSO)

CO	PSO1	PSO2	PSO3
CE8502.1	1	-	3
CE8502.2	1	-	3
CE8502.3	1	-	3
CE8502.4	1	-	3
CE8502.5	1	-	3
CE8502.6	1	-	3
CE8502	1	-	3

CE 8591 - FOUNDATION ENGINEERING

COURSE OUTCOME : The students will be able to

CE8591.1	Suggest various methods involved in sub soil exploration, Sampler and Sampling Techniques
CE8591.2	Design the foundation based on the bearing capacity of soil
CE8591.3	Carry out various test involved in settlement of foundation
CE8591.4	Identify the suitable type of footing for different loading conditions.
CE8591.5	Design pile foundations and determine their settlement for different soil conditions
CE8591.6	Analyze various pressure acting on retaining walls

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8591.1	-	-	1	-	-	2	2	-	1	2	1	-
CE8591.2	2	1	-	1	-	3	2	1	2	3	2	2
CE8591.3	2	1	2	1	-	3	3	1	1	3	2	1
CE8591.4	-	-	1	-	-	3	3	3	1	3	1	-
CE8591.5	2	-	1	-	-	2	3	2	2	3	3	1
CE8591.6	-	-	1	-	-	2	2	-	1	2	1	-
CE8591	2	1	-	1	-	3	2	1	2	3	2	2

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8591.1	-	1	1
CE8591.2	-	1	1
CE8591.3	2	2	2
CE8591.4	1	-	-
CE8591.5	1	1	1
CE8591.6	-	1	1
CE8591	-	1	1

EN 8491 - WATER SUPPLY ENGINEERING

COURSE OUTCOME : The students will be able to

CE8491.1	Insight into the structure of drinking water supply systems, including water transport, treatment and distribution
CE8491.2	Acquire knowledge in various unit operations and processes in water treatment
CE8491.3	Design the various functional units in water treatment
CE8491.4	Understand the water quality criteria and standards, and their relation to public health
CE8491.5	Design and evaluate water supply project alternatives on basis of chosen criteria
CE8491.6	Optimize the design of distribution system for water based on the real time requirement considering the operation and maintenance requirement.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8491.1	3	2	3	1	-	-	-	1	-	-	-	-
CE8491.2	3	3	3	1	-	-	-	1	1	-	-	-
CE8491.3	3	3	3	1	-	-	-	1	1	-	-	-
CE8491.4	3	3	3	1	-	-	-	1	1	-	-	-
CE8491.5	3	3	3	1	-	-	-	1	1	-	-	-
CE8491.6	3	3	3	1	-	-	-	1	1	-	-	-
CE8491	3	3	3	1	-	-	-	1	1	-	-	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8491.1	3	-	1
CE8491.2	3	-	1
CE8491.3	3	-	1
CE8491.4	3	-	1
CE8491.5	3	-	1
CE8491.6	3	-	1
CE8491	3	-	1

GE 8071- DISASTER MANAGEMENT**COURSE OUTCOME :** Student will be able to

GE8071.1	Differentiate the types of disasters, causes and their impact on environment and society
GE8071.2	Assess vulnerability and various methods of risk reduction measures as well as mitigation.
GE8071.3	Draw the hazard and vulnerability profile of India, Scenarios in the Indian context.
GE8071.4	Know the Disaster damage assessment and management.
GE8071.5	Awareness of institutional processes in the country and to develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live.
GE8071.6	Complete preparedness, response and recovery in order to reduce the impact of disasters.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
GE8071.1	3	3	2	3	-	-	2	2	-	-	2	-
GE8071.2	3	3	3	3	-	-	2	1	-	-	2	-
GE8071.3	3	3	3	3	-	-	2	2	-	-	-	-
GE8071.4	3	3	2	3	-	-	2	1	-	-	2	-
GE8071.5	3	3	2	3	-	-	2	2	-	-	2	-
GE8071.6	3	3	3	3	-	-	2	2	-	-	2	-
GE8071	3	3	3	3	-	-	2	2	-	-	2	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
GE8071.1	2	-	1
GE8071.2	2	-	1
GE8071.3	2	-	1
GE8071.4	2	-	1
GE8071.5	3	-	1
GE8071.6	2	-	1
GE8071	2	-	1

GI8014 - GEOGRAPHIC INFORMATION SYSTEM**COURSE OUTCOME :** The students completing the course will have

GI8014.1	Have basic idea about the fundamentals of GIS.
GI8014.2	Understand the types of data models.
GI8014.3	Get knowledge about data input and topology.
GI8014.4	Gain knowledge on data quality and standards.
GI8014.5	Understand data management functions and data output

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
GI8014.1	-	-	-	2	3	3	-	-	-	-	1	1
GI8014.2	-	-	-	2	3	3	-	-	-	-	1	1
GI8014.3	-	-	-	2	3	3	-	-	-	-	1	1
GI8014.4	-	-	-	2	3	3	-	-	-	-	1	1
GI8014.5	-	-	-	2	3	3	-	-	-	-	1	1
GI8014	-	-	-	2	3	3	-	-	-	-	1	1

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
GI8014.1	3	-	1
GI8014.2	3	-	1
GI8014.3	3	-	1
GI8014.4	3	-	1
GI8014.5	3	-	1
GI8014	3	-	1

CE849: SOIL MECHANICS LABORATORY**COURSE OUTCOME:** Students will be able to

CE8491.1	Classify the soil and assess the engineering properties based on index properties
CE8491.2	Understand the stress concepts in soils
CE8491.3	Understand and identify the settlement in soils
CE8491.4	Determine the shear strength of soil
CE8491.5	Analyse both finite and infinite slopes and slope protection measures

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8491.1	3	3	3	3	-	2	1	1	3	1	-	-
CE8491.2	3	3	3	3	-	2	1	1	3	1	-	-
CE8491.3	3	3	3	3	-	2	1	1	3	1	-	-
CE8491.4	3	3	3	3	-	2	1	1	3	1	-	-
CE8491.5	3	3	3	3	-	2	1	1	3	1	-	-
CE8491	3	3	3	3	-	2	1	1	3	1	-	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8491.1	2	-	1
CE8491.2	2	-	1
CE8491.3	2	-	1
CE8491.4	2	-	1
CE8491.5	3	-	1
CE8491	2	-	1

CE8512 : WASTE WATER ENGINEERING LABORATORY**COURSE OUTCOME:** The Students on completing the course will have

CE8512.1	Ability to estimate sewage generation and design sewer system including sewage pumping stations
CE 8512.2	Required understanding on the characteristics and composition of sewage, self purification of streams
CE 8512.3	Ability to perform basic design of the unit operations and processes that are used in sewage treatment
CE 8512.4	Understand the standard methods for disposal of sewage.
CE 8512.5	Gain knowledge on sludge treatment and disposal.
CE 8512.6	Knowledge on construction and operation & maintenance of sewage treatment plants.

Mapping of Course Outcome (CO) with Programme Outcome (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8512.1	3	3	2			3	3	3		2		2
CE 8512.2	3		3			2	1					
CE 8512.3	3					3	3	3				
CE 8512.4	3	2	2		2	3	3					2
CE 8512.5	3	2			2	3	3					
CE 8512.6	3	3	2		2	3	3	3		2		2
CE8512	3	3	2			3	3	3		2		2

Mapping of Course Outcome (CO) with Programme Specific Outcome (PSO)

CO	PSO1	PSO2	PSO3
CE8512.1	3	-	1
CE 8512.2	3	-	1
CE 8512.3	3	-	1
CE 8512.4	3	-	1
CE 8512.5	3	-	1
CE 8512.6	3	-	1
CE8512	3	-	1

CE8601 - DESIGN OF STEEL STRUCTURAL ELEMENTS**COURSE OUTCOME :** Upon completion of the course, the students will be able to...

CE8601.1	Understand the technical competence in the design of steel building
CE8601.2	Understand the concepts of working stress and limit state design philosophies
CE8601.3	Design common bolted and welded connections for steel structures
CE8601.4	Design tension members and understand the effect of shear lag.
CE8601.5	Understand the design concept of axially loaded columns and column
CE8601.6	Understand specific problems related to the design of laterally restrained and unrestrained steel beams

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8601.1	3	3	2	1	-	-	-	2	1	-	-	-
CE8601.2	3	3	3	2	-	-	-	1	1	-	-	-
CE8601.3	3	3	3	2	-	-	-	2	1	-	-	-
CE8601.4	3	3	2	2	-	-	-	2	1	-	-	-
CE8601.5	3	3	3	2	-	-	-	2	1	-	-	-
CE8601.6	3	3	2	2	-	-	-	2	1	-	-	-
CE8601	3	3	3	2	-	-	-	2	1	-	-	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8601.1	3	-	-
CE8601.2	3	-	-
CE8601.3	3	-	-
CE8601.4	3	-	-
CE8601.5	3	-	-
CE8601.6	3	-	-
CE8601	3	-	-

CE8602 - STRUCTURAL ANALYSIS II**COURSE OUTCOME:** The students will be able to

CE8602.1	Analyze the structure with moving loads using Influence line diagram method
CE8602.2	Analyze the indeterminate structure using Influence line diagram
CE8602.3	Analyze the arch structures
CE8602.4	Analyze the space and cable structures.
CE8602.5	Solve indeterminate beams and frames using plastic analysis method
CE8602.6	Apply various Advanced methods in the analysis of structural elements

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8602.1	3	3	2	2	1	-	2	-	1	-	2	-
CE8602.2	3	3	2	2	2	-	1	-	1	-	2	-
CE8602.3	3	3	2	2	2	-	1	-	1	-	2	-
CE8602.4	3	3	2	2	1	-	2	-	1	-	2	-
CE8602.5	3	3	2	2	1	-	1	-	1	-	2	-
CE8602.6	3	3	2	2	2	-	1	-	1	-	2	-
CE8602	3	3	2	2	2	-	1	-	1	-	2	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8602.1	3	-	-
CE8602.2	3	-	-
CE8602.3	-	-	1
CE8602.4	2	-	-
CE8602.5	3	-	-
CE8602.6	3	-	-
CE8602	3	-	1

CE8603 - IRRIGATION ENGINEERING**COURSE OUTCOME :** The students will be able to

CE8603.1	Have knowledge and skills on crop water requirements.
CE8603.2	Understand the methods and management of irrigation.
CE8603.3	Gain knowledge on types of Impounding structures
CE8603.4	Understand methods of irrigation including canal irrigation.
CE8603.5	Get knowledge on water management on optimization of water use.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8603.1	3	2	3	1	-	-	-	1	-	-	-	-
CE8603.2	3	3	3	1	-	-	-	1	1	-	-	-
CE8603.3	3	3	3	1	-	-	-	1	1	-	-	-
CE8603.4	3	3	3	1	-	-	-	1	1	-	-	-
CE8603.5	3	3	3	1	-	-	-	1	1	-	-	-
CE8603	3	3	3	1	-	-	-	1	1	-	-	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8603.1	3	-	1
CE8603.2	3	-	1
CE8603.3	3	-	1
CE8603.4	3	-	1
CE8603.5	3	-	1
CE8603	3	-	1

EN8592 - WASTE WATER ENGINEERING

COURSE OUTCOME: The Students on completing the course will have

EN8592.1	Ability to estimate sewage generation and design sewer system including sewage pumping stations
EN8592.2	Required understanding on the characteristics and composition of sewage, self-purification of streams
EN8592.3	Ability to perform basic design of the unit operations and processes that are used in sewage treatment
EN8592.4	Understand the standard methods for disposal of sewage.
EN8592.5	Gain knowledge on sludge treatment and disposal.
EN8592.6	Knowledge on construction and operation & maintenance of sewage treatment plants.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EN8592.1	3	2	3	1	-	-	-	1	-	-	-	-
EN8592.2	3	3	3	1	-	-	-	1	1	-	-	-
EN8592.3	3	3	3	1	-	-	-	1	1	-	-	-
EN8592.4	3	3	3	1	-	-	-	1	1	-	-	-
EN8592.5	3	3	3	1	-	-	-	1	1	-	-	-
EN8592.6	3	3	3	1	-	-	-	1	1	-	-	-
EN8592	3	3	3	1	-	-	-	1	1	-	-	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
EN8592.1	3	-	1
EN8592.2	3	-	1
EN8592.3	3	-	1
EN8592.4	3	-	1
EN8592.5	3	-	1
EN8592.6	3	-	1
EN8592	3	-	1

CE8604 - HIGHWAY ENGINEERING**COURSE OUTCOME:**

CE8604 .1	Planning, design for the construction of road structures
CE8604 .2	Design of aligning a new roadway
CE8604 .3	Design flexible and rigid pavement as per IRC standards and other methods
CE8604 .4	Knowledge about standard tests of highway materials and the methodology of road construction practice
CE8604 .5	Maintenance of highways as per IRC standards and other specifications.
CE8604 .6	Brief knowledge about flexible pavement, rigid pavement, highways construction and maintenance as per IRC standards and other methods

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8604 .1	2	2	2	2	-	-	2	-	-	-	-	-
CE8604 .2	3	3	3	3	-	-	2	1	-	-	2	-
CE8604 .3	3	3	3	3	-	-	1	1	-	-	2	-
CE8604 .4	3	2	3	3	-	-	2	1	-	-	2	-
CE8604 .5	3	2	2	2	-	-	1	1	-	-	1	-
CE8604 .6	2	2	3	2	-	-	1	-	-	-	1	-
CE8604	3	3	3	3	-	-	2	1	-	-	2	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8604 .1	2	1	-
CE8604 .2	1	-	-
CE8604 .3	1	-	1
CE8604 .4	-	-	-
CE8604 .5	-	1	1
CE8604 .6	-	1	-
CE8604	2	1	1

CE 8004 - URBAN PLANNING & DEVELOPMENT**COURSE OUTCOME:** Student will be able to

CE8004.1	Describe basic issues in urban planning
CE8004.2	Formulate plans for urban and rural development
CE8004.3	Plan and analyse socio economic aspects of urban and rural planning
CE8004.4	Design of urban development projects.
CE8004.5	Manage urban development projects.

Mapping of Course Outcome (CO) with Programme Outcome (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8004.1	3	2	3	1	-	-	-	1	-	-	2	-
CE8004.2	3	3	3	1	-	-	-	1	1	-	2	-
CE8004.3	3	3	3	1	-	-	-	1	1	-	2	-
CE8004.4	3	3	3	1	-	-	-	1	1	-	2	-
CE8004.5	3	3	3	1	-	-	-	1	1	-	2	-
CE8004	3	3	3	1	-	-	-	1	1	-	2	-

Mapping of Course Outcome (CO) with Programme Specific Outcome (PSO)

CO	PSO1	PSO2	PSO3
CE8004.1	3	-	1
CE8004.2	3	-	1
CE8004.3	3	-	1
CE8004.4	3	-	1
CE8004.5	3	-	1
CE8004	3	-	1

CE8005 - AIR POLLUTION AND CONTROL ENGINEERING**COURSE OUTCOME :** The students completing the course will have

CE8005.1	An understanding of the nature and characteristics of the air pollutants.
CE8005.2	Knowledge on basic concepts of air quality management and ability to identify the various types of plume dispersion
CE8005.3	Ability to select appropriate equipments and models to control the pollutants
CE8005.4	Capability to monitor the air quality standards for gaseous contaminants.
CE8005.5	The Competence to identify, control and prevent noise pollution.
CE8005.6	Ability to design stacks and particulate air pollution control devices to meet applicable standards

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAM OUTCOME (PO)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
OCE551.1	3	1	3	2	-	-	3	1	-	3	2	-
OCE551.2	3	1	3	1	-	-	3	1	-	3	2	-
OCE551.3	3	2	3	2	-	-	3	1	-	2	1	-
OCE551.4	3	1	2	2	-	-	3	2	-	3	3	-
OCE551.5	3	2	2	2	-	-	3	1	-	3	2	-
OCE551.6	3	3	2	2	-	-	3	2	-	3	3	-
OCE551	3	2	3	2	-	-	3	1	-	3	2	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAM SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
OCE551.1	3	1	1
OCE551.2	1	1	2
OCE551.3	2	2	2
OCE551.4	1	1	1
OCE551.5	1	2	1
OCE551.6	1	1	2
OCE551	2	1	2

CE8512 - WASTE WATER ENGINEERING LABORATORY**COURSE OUTCOME:** The Students on completing the course will have

CE8512.1	Ability to estimate sewage generation and design sewer system including sewage pumping stations
CE 8512.2	Required understanding on the characteristics and composition of sewage, self purification of streams
CE 8512.3	Ability to perform basic design of the unit operations and processes that are used in sewage treatment
CE 8512.4	Understand the standard methods for disposal of sewage.
CE 8512.5	Gain knowledge on sludge treatment and disposal.
CE 8512.6	Knowledge on construction and operation & maintenance of sewage treatment plants.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8512.1	3	3	2			3	3	3		2		2
CE 8512.2	3		3			2	1					
CE 8512.3	3					3	3	3				
CE 8512.4	3	2	2		2	3	3					2
CE 8512.5	3	2			2	3	3					
CE 8512.6	3	3	2		2	3	3	3		2		2
CE8512	3	3	2			3	3	3		2		2

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8512.1	3	-	1
CE 8512.2	3	-	1
CE 8512.3	3	-	1
CE 8512.4	3	-	1
CE 8512.5	3	-	1
CE 8512.6	3	-	1
CE8512	3	-	1

CE8011 - PRESTRESSED CONCRETE STRUCTURES**COURSE OUTCOME :** Upon completion of the course, the students will be able to...

CE8011.1	Get a basic knowledge of Prestressed Concrete Structure & their behavior and also gain the knowledge of the methods of analysis of prestressed concrete, losses in prestress & deflection
CE8011.2	Get a basic knowledge of the design and analysis of flexural member in prestressed concrete structures
CE8011.3	Gain the knowledge of the concept of deflection and design criteria of anchorage zone
CE8011.4	Understand the design criteria of prestressed concrete composite beams and Continuous beams
CE8011.5	Get a basic knowledge of design criteria of tension and compression members
CE8011.6	Gain the knowledge of the concept and design criteria of prestressed concrete pipes & tanks

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8011.1	3	2	1	2	-	-	-	2	-	-	-	-
CE8011.2	3	3	1	2	-	-	-	2	-	-	-	-
CE8011.3	3	3	2	2	-	-	-	2	-	-	-	-
CE8011.4	3	3	2	2	-	-	-	2	-	-	-	-
CE8011.5	3	3	2	2	-	-	-	2	-	-	-	-
CE8011.6	3	3	2	2	-	-	-	2	-	-	-	-
CE8011	3.0	3.0	2.0	2.0	-	-	-	2.0	-	-	-	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8011.1	3	-	-
CE8011.2	3	-	-
CE8011.3	3	-	-
CE8011.4	3	-	-
CE8011.5	3	-	-
CE8011.6	3	-	-
CE8011	3	-	-

CE 8006 - PAVEMENT ENGINEERING

COURSE OUTCOME : upon completion of the course, the students will be able to

CE8006.1	Determine the stress and deflections in pavements under repeated loading
CE8006.2	Design flexible pavements as per IRC guidelines
CE8006.3	Design rigid pavements as per IRC guidelines
CE8006.4	Evaluate performance and maintenance of rigid and flexible pavements as per IRC Guidelines
CE8006.5	Test and field control stabilization for rural roads in India by using Geosynthetics in Roads
CE8006.6	Choose different types of stabilizers for roads in India

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8006.1	3	3	3	2	-	-	1	1	1	-	-	-
CE8006.2	3	3	3	2	-	-	1	1	1	-	-	-
CE8006.3	3	3	3	2	-	-	1	1	1	-	-	-
CE8006.4	3	1	1	2	-	-	3	1	1	-	-	-
CE8006.5	3	1	1	2	-	-	3	1	1	-	-	-
CE8006.6	1	1	1	2	-	-	3	1	1	-	-	-
CE8006.	3	3	3	2	-	-	3	1	1	-	-	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8006.1	3	1	3
CE8006.2	3	1	3
CE8006.3	3	1	3
CE8006.4	3	1	3
CE8006.5	3	1	3
CE8006.6	3	1	3
CE8006	3	1	3

CE 8701 - ESTIMATION, COSTING AND VALUATION ENGINEERING**COURSE OUTCOME:**

CE8701.1	Estimate of quantities of items for different types of buildings by various methods.
CE8701.2	Prepare rate Analysis for all Building works, canals, roads and Cost Estimate.
CE8701.3	Understand types of specifications, principles for report preparation and tender notices.
CE8701.4	Gaining knowledge about type of contracts and drafting of contract documents.
CE8701.5	Prepare a value estimate and fixing the rent for different properties
CE8701.6	Prepare the reports for different civil engineering projects

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8701.1	3	3	3	1	-	-	1	1	-	-	3	-
CE8701.2	3	3	3	1	-	-	-	1	-	-	3	-
CE8701.3	1	-	-	-	-	-	1	1	-	-	-	-
CE8701.4	3	1	1	1	-	-	1	1	-	-	3	-
CE8701.5	3	3	3	2	-	-	1	1	-	-	2	-
CE8701.6	1	-	-	-	-	-	-	1	-	2	3	-
CE8701	3	3	3	2	-	-	1	1	-	2	3	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

CO	PSO1	PSO2	PSO3
CE8701.1	2	-	-
CE8701.2	2	-	1
CE8701.3	1	-	1
CE8701.4	2	-	1
CE8701.5	2	-	2
CE8701.6	1	-	2
CE8701	2	-	2

CE8702 - RAILWAY, AIRPORT & HARBOUR ENGINEERING

COURSE OUTCOME : The students will be able to

CE8702.1	Understand the history of Indian railways, components of track and geometric design of railway track
CE8702.2	Understand the concept of drainage, earthwork, tunneling, and modern methods of track maintenance, urban rail, Metro and underground railways.
CE8702.3	Develop knowledge on airport planning and to acquire knowledge on site investigation for location and design considerations on runway and taxiways.
CE8702.4	Gain knowledge on airport buildings, motor vehicle parking, lightings and air traffic control systems.
CE8702.5	Acquaint knowledge on harbor engineering, classification of harbours.
CE8702.6	Gain knowledge on Coastal Structures like Piers, Break waters, Wharves, Jetties, Quays, Spring Fenders and will have awareness about coastal erosion.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8702.1	3	1	2	1	-	-	-	1	-	-	-	-
CE8702.2	3	2	3	2	-	-	1	1	-	-	-	-
CE8702.3	3	2	3	3	-	-	1	1	-	-	-	-
CE8702.4	3	2	3	2	-	-	1	1	-	-	-	-
CE8702.5	2	1	1	1	-	-	1	1	-	-	-	-
CE8702.6	2	1	2	2	-	-	1	-	-	-	-	-
CE8702	3	2	3	3	-	-	1	1	-	-	-	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

Course outcome	PSO1	PSO2	PSO3
CE8702.1	2	1	1
CE8702.2	3	1	1
CE8702.3	3	1	1
CE8702.4	3	1	1
CE8702.5	1	1	1
CE8702.6	3	1	1
CE8702	3	1	1

CE8703 - STRUCTURAL DESIGN AND DRAWING**COURSE OUTCOME :** The students will be able to

CE8703.1	Design and draw reinforced concrete Cantilever and Counterfort Retaining Walls
CE8703.2	Design and draw flat slab as per code provision
CE8703.3	Design and draw reinforced concrete and steel bridge
CE8703.4	Design and draw reinforced concrete and steel water tanks
CE8703.5	Design and detail the various steel trusses
CE8703.6	Design and detail the various types of girders.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8703.1	3	3	3	-	-	-	-	2	1	-	-	-
CE8703.2	3	3	3	-	-	-	-	2	1	-	-	-
CE8703.3	3	3	3	-	-	-	-	2	1	-	-	-
CE8703.4	3	3	3	-	-	-	-	2	1	-	-	-
CE8703.5	3	3	3	-	-	-	-	2	1	-	-	-
CE8703.6	3	3	3	-	-	-	-	2	1	-	-	-
CE8703	3	3	3	-	-	-	-	2	1	-	-	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

Course outcome	PSO1	PSO2	PSO3
CE8703.1	3	-	1
CE8703.2	3	-	1
CE8703.3	3	-	1
CE8703.4	3	-	1
CE8703.5	3	-	1
CE8703.6	3	-	1
CE8703	3	-	1

EN8591 MUNICIPAL SOLID WASTE MANAGEMENT

COURSE OUTCOME:The Student will be able to...

EN8591.1	Understand of the nature, characteristics and ill effects of municipal solid
EN8591.2	Regulate requirements regarding municipal solid waste management.
EN8591.3	Suggest various storage and processing methods and ability to select appropriate method for a specific scenario
EN8591.4	Suggest various collection methods and routes of solid wastes
EN8591.5	Apply various disposal methods and post disposal effects of Municipal Solid Wastes.
EN8591.6	Ability to plan waste minimisation and design storage, collection, transport, processing and disposal of municipal solid waste

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EN8591.1	3	1	-	-	-	2	3	3	-	2	2	-
EN8591.2	1	1	-	-	-	2	2	2	-	2	2	-
EN8591.3	3	1	-	-	-	2	3	2	-	2	2	-
EN8591.4	3	1	-	-	-	1	3	3	-	2	2	-
EN8591.5	3	1	-	-	-	2	2	2	-	2	2	-
EN8591.6	3	1	-	-	-	2	2	3	-	2	2	-
EN8591	3	1	-	-	-	2	3	3	-	2	2	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

Course outcome	PSO1	PSO2	PSO3
EN8591.1	1	1	-
EN8591.2	-	-	3
EN8591.3	3	2	3
EN8591.4	3	1	2
EN8591.5	3	2	3
EN8591.6	3	2	3
EN8591	3	2	3

GE8076 - PROFESSIONAL ETHICS IN ENGINEERING**COURSE OUTCOME:** Student will be able to

GE8076.1	Understand the essence of Ethics
GE8076.2	Understand about various morals and values for professional excellence
GE8076.3	Know the different ideas of Engineering Ethics
GE8076.4	Stand on the point of safety, responsibility and rights in society
GE8076.5	Understand and aware about global issues of ethics and its applicability
GE8076.6	Feel the overall discipline and moral principles being professional

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12
GE8076.1	1	2	2	3	3	1	2	1	3	1	3	2
GE8076.2	1	1	2	3	2	2	3	2	2	3	1	3
GE8076.3	2	2	1	3	2	3	1	2	1	2	1	3
GE8076.4	2	2	1	3	3	1	2	3	2	3	1	2
GE8076.5	2	2	2	3	3	3	3	2	3	2	1	2
GE8076.6	1	2	2	3	3	1	2	1	3	1	3	2
GE8076	1	1	2	3	2	2	3	2	2	3	1	3

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

Course outcome	PSO1	PSO2	PSO3
GE8076.1	3	1	3
GE8076.2	2	1	3
GE8076.3	2	3	3
GE8076.4	2	3	3
GE8076.5	3	1	3
GE8076.6	3	1	3
GE8076	2	1	3

CE8021 STRUCTURAL DYNAMICS AND EARTHQUAKE ENGINEERING**COURSE OUTCOMES**

CE8021.1	Apply knowledge in dynamic forces acting on structures
CE8021.2	Apply knowledge in Modes of vibrations of structures
CE8021.3	Measure the causes and effects of earthquakes
CE8021.4	Apply knowledge in IS codal provisions of response of different types of structures to earthquake
CE8021.5	Ability to analyze and design the structures for seismic forces
CE8021.6	Apply knowledge on various vibration control measures.

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8021.1	3	3	3	1	-	-	1	1	-	-	3	-
CE8021.2	3	3	3	1	-	-	-	1	-	-	3	-
CE8021.3	1	-	-	-	-	-	1	1	-	-	-	-
CE8021.4	3	1	1	1	-	-	1	1	-	-	3	-
CE8021.5	3	3	3	2	-	-	1	1	-	-	2	-
CE8021.6	1	-	-	-	-	-	-	1	-	-	3	-
CE8021	3	3	3	2	-	-	1	1	-	-	3	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

Course outcome	PSO1	PSO2	PSO3
CE8021.1	3	-	-
CE8021.2	3	-	-
CE8021.3	3	-	-
CE8021.4	3	-	-
CE8021.5	3	-	-
CE8021.6	3	-	1
CE8021	3	-	1

CE8020 MAINTENANCE, REPAIR AND REHABILITATION OF STRUCTURES

COURSE OUTCOMES:The students will be able to...

CE8020.1	Find out causes of deterioration.
CE8020.2	Apply various durability parameters suitably
CE8020.3	Use different type of material used for repair
CE8020.4	Choose among different techniques of repair
CE8020.5	Implement various methods of demolition practices
CE8020.6	Identify the cracks due to structural deficiency

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8020.1	3	3	2	3	-	-	2	3	-	-	3	-
CE8020.2	3	2	3	3	1	-	3	3	-	-	3	-
CE8020.3	3	3	3	3	-	-	3	3	-	-	3	-
CE8020.4	3	3	3	3	1	-	2	3	-	-	3	-
CE8020.5	3	3	3	3	-	-	3	3	-	-	3	-
CE8020.6	3	3	2	3	-	1	3	3	-	-	3	-
CE8020	3	3	3	3	1	1	3	3	-	-	3	-

Mapping of Course Outcome (CO) with Programme Specific Outcome (PSO)

Course outcome	PSO1	PSO2	PSO3
CE8020.1	1	-	-
CE8020.2	2	-	1
CE8020.3	1	2	2
CE8020.4	2	-	1
CE8020.5	1	-	1
CE8020.6	1	-	2
CE8020	2	2	2

CE8022 PREFABRICATED STRUCTURES

COURSE OUTCOMES: Upon completion of the course, the students will be able to...

CE8022.1	Check the preparation techniques, stocking, transportation and erection of the prefabricated elements
CE8022.2	Check the quality of materials, mix design.
CE8022.3	use components in the field and standardization of structural components.
CE8022.4	Use the relevant Bureau of Indian Standards on Prefabrication
CE8022.5	Design the disuniting of the structures, joints, jointing materials and having the knowledge about the problems in joint flexibility
CE8022.6	Design for abnormal load, viz. seismic load, impact load, cycle force, etc.,

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME OUTCOME (PO)

Course outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CE8020.1	3	1	3	1	-	2	-	2	-	2	2	-
CE8020.2	3	3	3	3	-	2	-	2	-	2	2	-
CE8020.3	3	2	3	3	-	2	-	2	-	2	2	-
CE8020.4	3	3	3	3	-	2	-	2	-	2	2	-
CE8020.5	3	3	3	3	-	2	-	2	-	2	2	-
CE8020.6	3	3	3	3	-	2	-	2	-	2	2	-
CE8020	3	3	3	3	-	2	-	2	-	2	2	-

MAPPING OF COURSE OUTCOME (CO) WITH PROGRAMME SPECIFIC OUTCOME (PSO)

Course outcome	PSO1	PSO2	PSO3
CE8020.1	3	1	2
CE8020.2	3	1	2
CE8020.3	3	1	2
CE8020.4	3	1	2
CE8020.5	3	1	2
CE8020.6	3	1	2
CE8020	3	1	2