



# SRI BHARATHI

ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)  
Kaikkurichi, Pudukkottai -622 303

[www.sbec.edu.in](http://www.sbec.edu.in)

## NAAC DOCUMENTS



Quality Indicator Frame Work

Criterion – 2

Teaching-Learning and Evaluation

Submitted by

**IQAC**

**Internal Quality Assurance Cell**

**Sri Bharathi Engineering College for Women**



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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

<b>Criteria 2</b>	<b>Teaching-Learning and Evaluation</b>	<b>350</b>
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## **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  
R2017



**SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN**

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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

DEPARTMENT OF CIVIL ENGINEERING

CO-PO MAPPING – 2017 REGULATION

**I SEMESTER**

Dr. **S. THILAGAVATHI** M.E., Ph.D.,

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**SRI BHARATHI ENGINEERING  
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Kaikkurichi - 622 303, Pudukkottai Dt.





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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### HS8151- COMMUNICATIVE ENGLISH

Course Code	Course Name	Course Outcome (CO) Students will be able to
HS8151	Communicative English	C101.1: Develop vocabulary of a general kind by developing their reading skills
		C101.2: Explain their opinions in English and Participate effectively in informal conversations; introduce themselves and their friends.
		C101.3: Comprehend conversations and short talks delivered in English.
		C101.4: Write short essays of a general kind and personal letters and emails in English.
		C101.5: Develop their speaking skills and speak fluently in real contexts.
		C101.6: Discuss about the general kind in magazines and newspapers.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
HS8151	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
C101.1	-	-	-	-	-	2	2	2	2	2	-	2	-	-	-
C101.2	-	-	-	-	-	2	2	2	2	2	-	2	-	-	-
C101.3	-	-	-	-	-	2	2	2	2	2	-	2	-	-	-
C101.4	-	-	-	-	-	2	2	2	2	2	-	2	-	-	-
C101.5	-	-	-	-	-	2	2	2	2	2	-	2	-	-	-
C101.6	-	-	-	-	-	2	2	2	2	2	-	2	-	-	-
C101	-	-	-	-	-	2	2	2	2	2	-	2	-	-	-

\*3-High Correlation; 2-Medium Correlation; 1-Low Correlation

  
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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### MA8151- ENGINEERING MATHEMATICS – I

Course Code	Course Name	Course Outcome (CO) Students will be able to
MA8151	Engineering Mathematics – I	C102.1: Apply the limit definition and rules of differentiation to differentiate functions.
		C102.2: Apply differentiation to solve maxima and minima problems.
		C102.3: Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.
		C102.4: Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables
		C102.5: Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts.
		C102.6: Apply various techniques in solving differential equations.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
MA8151															
C102.1	3	2	2	2	-	-	-	-	-	2	-	2	-	2	-
C102.2	3	2	2	2	-	-	-	-	-	2	-	2	-	2	-
C102.3	3	2	2	2	-	-	-	-	-	2	-	2	-	2	-
C102.4	3	2	2	2	-	-	-	-	-	2	-	2	-	2	-
C102.5	3	2	2	2	-	-	-	-	-	2	-	2	-	2	-
C102.6	3	2	2	2	-	-	-	-	-	2	-	2	-	2	-
C102	3	2	2	2	-	-	-	-	-	2	-	2	-	2	-

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### REGULATION 2017- CO-PO MAPPING

#### PH8151- ENGINEERING PHYSICS

Course Code	Course Name	Course Outcome (CO) Students will be able to
PH8151	Engineering Physics	C103.1: Explain the basics of properties of matter and its applications.
		C103.2: Describe the characteristics of laser light and their application in semiconductor laser
		C103.3: Discuss the principle behind the propagation of light through an optical fiber and its application in sensors
		C103.4: Summarize the different modes of heat transfer.
		C103.5: Relate the quantum concepts in electron microscopes
		C103.6: Describe the unit cell characteristics and the growth of crystals.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
PH8151															
C103.1	2	2	1	-	-	-	1	-	-	-	-	1	-	-	-
C103.2	2	2	1	-	-	-	1	-	-	-	-	1	-	-	-
C103.3	2	2	1	-	-	-	1	-	-	-	-	-	-	-	-
C103.4	2	2	1	-	-	-	1	-	-	-	-	1	-	-	-
C103.5	2	2	1	-	-	-	1	-	-	-	-	-	-	-	-
C103.6	2	2	1	-	-	-	1	-	-	-	-	1	-	-	-
C103	2	2	1	-	-	-	1	-	-	-	-	1	-	-	-

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### REGULATION 2017- CO-PO MAPPING

#### CY8151- ENGINEERING CHEMISTRY

Course Code	Course Name	Course Outcome (CO) Students will be able to
CY8151	Engineering Chemistry	C104.1: Summarize the water related problems in boilers and their treatment techniques.
		C104.2: Discuss the applications of adsorption in the field of water and air pollution abatement.
		C104.3: Discuss the types of catalysis and the mechanism of enzyme catalysis
		C104.4: Apply phase rule in the alloying and the behaviour of one component and two component systems using phase diagram
		C104.5: Explain various types of fuels, their manufacturing processes and calculation of calorific theoretically
		C104.6: Summarize the principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills and fuel cells

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CY8151															
C104.1	3	2	1	1	-	-	1	-	-	1	-	1	1	-	-
C104.2	3	2	1	1	-	-	1	-	-	1	-	1	1	-	-
C104.3	3	2	1	1	-	-	1	-	-	1	-	1	1	-	-
C104.4	3	2	1	1	-	-	1	-	-	1	-	1	1	-	-
C104.5	3	2	1	1	-	-	1	-	-	1	-	1	1	-	-
C104.6	3	2	1	1	-	-	1	-	-	1	-	1	1	-	-
C104	3	2	1	1	-	-	1	-	-	1	-	1	1	-	-

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### REGULATION 2017- CO-PO MAPPING

#### GE8151- PROBLEM SOLVING AND PYTHON PROGRAMMING

Course Code	Course Name	Course Outcome (CO) Students will be able to
GE8151	Problem Solving And Python Programming	C105.1: Explain the basics of fundamentals of computing.
		C105.2: Describe the basics of algorithmic problem solving.
		C105.3: Solve problems using Python conditionals and loops.
		C105.4: Define Python functions and use function calls to solve problems
		C105.5: Apply Python data structures - lists, tuples and dictionaries to represent complex data.
		C105.6: Explain the importance of Read and write data from/to files in Python programs.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
GE8151															
C105.1	2	2	1	-	-	-	-	-	-	-	-	-	1	2	-
C105.2	3	2	2	-	1	-	-	-	-	-	-	-	1	2	1
C105.3	2	2	2	1	1	-	-	-	-	-	-	-	1	2	1
C105.4	2	2	2	1	1	-	-	-	-	-	-	-	1	2	1
C105.5	3	2	2	1	1	-	-	-	-	-	-	-	1	2	1
C105.6	2	2	1	1	1	-	-	-	-	-	-	-	1	2	1
C105	2	2	2	1	1	-	-	-	-	-	-	-	1	2	1

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### REGULATION 2017- CO-PO MAPPING

#### GE8152- ENGINEERING GRAPHICS

Course Code	Course Name	Course Outcome (CO) Students will be able to
GE8152	Engineering Graphics	C106.1: Familiarize with the fundamentals and standards of Engineering graphics
		C106.2: Perform freehand sketching of basic geometrical constructions and multiple views of objects.
		C106.3: Project orthographic projections of lines and plane surfaces.
		C106.4: Draw projections and solids and development of surfaces.
		C106.5: Visualize and to project isometric sections of simple solids.
		C106.6: Visualize and to project perspective sections of simple solids.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
GE8152															
C106.1	3	2	1	1	-	1	1	-	1	1	1	-	1	-	-
C106.2	3	2	1	1	-	1	1	-	1	1	1	-	1	-	-
C106.3	3	2	1	1	-	1	1	-	1	1	1	-	1	-	-
C106.4	3	2	1	1	-	1	1	-	1	1	1	-	1	-	-
C106.5	3	2	1	1	-	1	1	-	1	1	1	-	1	-	-
C106.6	3	2	1	1	-	1	1	-	1	1	1	-	1	-	-
C106	3	2	1	1	-	1	1	-	1	1	1	-	1	-	-

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### REGULATION 2017- CO-PO MAPPING

#### GE8161- PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY

Course Code	Course Name	Course Outcome (CO) Students will be able to
GE8161	Problem Solving And Python Programming Laboratory	C107.1: Develop algorithmic solutions to simple computational problems
		C107.2: Design and execute simple Python programs.
		C107.3: Solve programs in Python using conditionals and loops for solving problems.
		C107.4: Apply functions to decompose a Python program.
		C107.5: Analyze compound data using Python data structures.
		C107.6: Utilize Python packages in developing software applications.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
GE8161															
C107.1	3	2	2	1	1	-	-	-	1	1	-	1	2	-	2
C107.2	3	2	2	1	1	-	-	-	1	1	-	1	2	-	2
C107.3	3	2	2	1	1	-	-	-	1	1	-	1	2	-	2
C107.4	3	2	2	1	1	-	-	-	1	1	-	1	2	-	2
C107.5	3	2	2	1	1	-	-	-	1	1	-	1	2	-	2
C107.6	3	2	2	1	1	-	-	-	1	1	-	1	2	-	2
C107	3	2	2	1	1	-	-	-	1	1	-	1	2	-	2

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### REGULATION 2017- CO-PO MAPPING

#### BS8161- PHYSICS AND CHEMISTRY LABORATORY

Course Code	Course Name	Course Outcome (CO) Students will be able to
BS8161	Physics And Chemistry Laboratory	C108.1: Determine the Modulus of elasticity of materials and Coefficient of Viscosity of liquids.
		C108.2: Determine the Thermal Conductivity of bad conductor using Lee's disc method.
		C108.3: Determine wavelength and particle size using Laser and Determination of acceptance angle in an optical fibre.
		C108.4: Calculate water quality parameters such as hardness, alkalinity of the given water sample.
		C108.5: Estimate the amount of the given acids using pH titrations.
		C108.6: Determine the amount of iron content in the given substance using potentiometric titration and Determine the amount of chloride content in the given water sample

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
BS8161																
C108.1	3	2	2	1	1	-	-	-	1	1	-	1	2	1	-	
C108.2	3	2	2	1	1	-	-	-	1	1	-	1	2	1	-	
C108.3	3	2	2	1	1	-	-	-	1	1	-	1	2	1	-	
C108.4	3	2	2	1	1	-	-	-	1	1	-	1	2	1	-	
C108.5	3	2	2	1	1	-	-	-	1	1	-	1	2	1	-	
C108.6	3	2	2	1	1	-	-	-	1	1	-	1	2	1	-	
C108	3	2	2	1	1	-	-	-	1	1	-	1	2	1	-	

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**CO-PO MAPPING – 2017 REGULATION**

# **II SEMESTER**

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### REGULATION 2017- CO-PO MAPPING

#### HS8251- TECHNICAL ENGLISH

Course Code	Course Name	Course Outcome (CO) Students will be able to
HS8251	Technical English	C109.1: Apply strategies in reading and comprehending engineering and technology text.
		C109.2: Use convincing job applications.
		C109.3: Apply speaking skill to make technical presentations.
		C109.4: Use the formats for effective report writing.
		C109.5: Apply speaking skill to participate in group discussions.
		C109.6: Apply the active listening skills to comprehend lectures and technical talks.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
HS8251															
C109.1	-	-	-	-	-	2	2	2	2	2	-	2	-	-	-
C109.2	-	-	-	-	-	2	2	2	2	2	-	2	-	-	-
C109.3	-	-	-	-	-	2	2	2	2	2	-	2	-	-	-
C109.4	-	-	-	-	-	2	2	2	2	2	-	2	-	-	-
C109.5	-	-	-	-	-	2	2	2	2	2	-	2	-	-	-
C109.6	-	-	-	-	-	2	2	2	2	2	-	2	-	-	-
C109	-	-	-	-	-	2	2	2	2	2	-	2	-	-	-

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### REGULATION 2017- CO-PO MAPPING

#### MA8251- ENGINEERING MATHEMATICS – II

Course Code	Course Name	Course Outcome (CO) Students will be able to
MA8251	Engineering Mathematics – II	C110.1: Explain about the Eigen values and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.
		C110.2: Apply Gradient, divergence and curl of a vector point function and related identities.
		C110.3: Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.
		C110.4: Evaluate the problems based on Analytic functions, conformal mapping and complex integration.
		C110.5: Explain about the Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.
		C110.6: Evaluate the linear second order differential equations with constant coefficients

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
MA8251															
C110.1	3	2	2	2	-	-	-	-	-	2	-	2	1	1	-
C110.2	3	2	2	2	-	-	-	-	-	2	-	2	1	1	-
C110.3	3	2	2	2	-	-	-	-	-	2	-	2	1	1	-
C110.4	3	2	2	2	-	-	-	-	-	2	-	2	1	1	-
C110.5	3	2	2	2	-	-	-	-	-	2	-	2	1	1	-
C110.6	3	2	2	2	-	-	-	-	-	2	-	2	1	1	-
C110	3	2	2	2	-	-	-	-	-	2	-	2	1	1	-

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#### PH8201-PHYSICS FOR CIVIL ENGINEERING

Course Code	Course Name	Course Outcome (CO) Students will be able to
PH8201	Physics For Civil Engineering	C111.1: Explain about the thermal performance of buildings.
		C111.2: Describe the acoustic properties of buildings.
		C111.3: Illustrate about the various lighting designs for buildings.
		C111.4: Explain the properties and performance of engineering materials.
		C111.5: Explain about the various hazards of buildings.
		C111.6: Describe about the principles of optics and new materials for civil engineering applications.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
PH8201															
C111.1	2	2	2	2	-	-	-	-	-	2	-	2	2	-	-
C111.2	2	2	2	2	-	-	-	-	-	2	-	2	2	-	-
C111.3	2	2	2	2	-	-	-	-	-	2	-	2	2	-	-
C111.4	2	2	2	2	-	-	-	-	-	2	-	2	2	-	-
C111.5	2	2	2	2	-	-	-	-	-	2	-	2	2	-	-
C111.6	2	2	2	2	-	-	-	-	-	2	-	2	2	-	-
C111	2	2	2	2	-	-	-	-	-	2	-	2	2	-	-

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### BE8251-BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Course Code	Course Name	Course Outcome (CO) Students will be able to
BE8251	Basic Electrical And Electronics Engineering	C112.1: Identify the electrical components and explain the characteristics of electrical machines.
		C112.2: Identify electronics components and understand the characteristics
		C112.3: Explain the basic theorems used in Electrical circuits and the different components and function of electrical machines.
		C112.4: Explain the fundamentals of semiconductor and applications.
		C112.5: Explain the principles of digital electronics
		C112.6: Develop the knowledge of communication.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
BE8251															
C112.1	2	2	2	2	-	1	-	-	-	1	-	1	1	-	-
C112.2	2	2	2	2	-	1	-	-	-	1	-	1	1	-	-
C112.3	2	2	2	2	-	1	-	-	-	1	-	1	1	-	-
C112.4	2	2	2	2	-	1	-	-	-	1	-	1	1	-	-
C112.5	2	2	2	2	-	1	-	-	-	1	-	1	1	-	-
C112.6	2	2	2	2	-	1	-	-	-	1	-	1	1	-	-
C112	2	2	2	2	-	1	-	-	-	1	-	1	1	-	-

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### GE8291- ENVIRONMENTAL SCIENCE AND ENGINEERING

Course Code	Course Name	Course Outcome (CO) Students will be able to
GE8291	Environmental Science and Engineering	C113.1: Summarize the values, threats, conservation of biodiversity and ecosystems.
		C113.2: Describe the sources, effects, control measures of different types of pollution, and solid waste management.
		C113.3: Associate the effects of exploitation of Natural resources on environment.
		C113.4: Summarize the water conservation methods and various environmental acts for environmental sustainability.
		C113.5: Explain the effect of Human population and role of IT in environment and human health.
		C113.6: Discuss scientific, technological, economic and social solutions to environmental problems.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
GE8291															
C113.1	2	2	-	-	2	2	1	1	-	-	-	1	-	-	-
C113.2	2	2	-	-	2	2	1	1	-	-	-	1	-	-	-
C113.3	2	2	-	-	2	2	1	1	-	-	-	1	-	-	-
C113.4	2	2	-	-	2	2	1	1	-	-	-	1	-	-	-
C113.5	2	2	-	-	2	2	1	1	-	-	-	1	-	-	-
C113.6	2	2	-	-	2	2	1	1	-	-	-	1	-	-	-
C113	2	2	-	-	2	2	1	1	-	-	-	1	-	-	-

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### GE8292-ENGINEERING MECHANICS

Course Code	Course Name	Course Outcome (CO) Students will be able to
GE8292	Engineering Mechanics	C114.1: Illustrate the vectorial and scalar representation of forces and moments.
		C114.2: Analyse the rigid body in equilibrium.
		C114.3: Evaluate the properties of surfaces and solids.
		C114.4: Calculate dynamic forces exerted in rigid body.
		C114.5: Determine the friction .
		C114.6: Analyse the effects by the laws of friction.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
C114.1	3	2	2	2	-	-	1	-	2	1	-	1	2	2	-
C114.2	3	2	2	2	-	-	1	-	2	1	-	1	2	2	-
C114.3	3	2	2	2	-	-	1	-	2	1	-	1	2	2	-
C114.4	3	2	2	2	-	-	1	-	2	1	-	1	2	2	-
C114.5	3	2	2	2	-	-	1	-	2	1	-	1	2	2	-
C114.6	3	2	2	2	-	-	1	-	2	1	-	1	2	2	-
C114	3	2	2	2	-	-	1	-	2	1	-	1	2	2	-

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### GE8261- ENGINEERING PRACTICES LABORATORY

Course Code	Course Name	Course Outcome (CO) Students will be able to
GE8261	Engineering Practices Laboratory	C115.1: Fabricate carpentry components and pipe connections including plumbing works.
		C115.2: Use welding equipments to join the structures
		C115.3: Carry out the basic machining operations
		C115.4: Make the models using sheet metal works
		C115.5: Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundry and fittings
		C115.6: Carry out basic home electrical works and appliances

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
GE8261															
C115.1	3	2	2	2	-	2	-	-	1	1	-	1	2	2	1
C115.2	3	2	2	2	-	2	-	-	1	1	-	1	2	2	1
C115.3	3	2	2	2	-	2	-	-	1	1	-	1	2	2	1
C115.4	3	2	2	2	-	2	-	-	1	1	-	1	2	2	1
C115.5	3	2	2	2	-	2	-	-	1	1	-	1	2	2	1
C115.6	3	2	2	2	-	2	-	-	1	1	-	1	2	2	1
C115	3	2	2	2	-	2	-	-	1	1	-	1	2	2	1

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8211- COMPUTER AIDED BUILDING DRAWING

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8211	Computer Aided Building Drawing	<b>C116.1:</b> Draft the plan, elevation and sectional views of the buildings, industrial structures, and framed buildings using computer softwares.
		<b>C116.2:</b> Draft the principles of planning, orientation and complete joinery details (paneled and glazed doors and windows).
		<b>C116.3:</b> Draft the buildings with load bearing walls.
		<b>C116.4:</b> Draft the buildings with sloping roof.
		<b>C116.5:</b> Draft the R.C.C. framed structures.
		<b>C116.6:</b> Draft the Industrial buildings – North light roof structures.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8211															
C116.1	3	2	2	1	1	3	-	1	1	1	-	1	1	-	1
C116.2	3	2	2	1	1	3	-	1	1	1	-	1	1	-	1
C116.3	3	2	2	1	1	3	-	1	1	1	-	1	1	-	1
C116.4	3	2	2	1	1	3	-	1	1	1	-	1	1	-	1
C116.5	3	3	2	2	1	3	-	1	1	1	-	1	1	-	1
C116.6	3	2	2	1	1	3	-	1	1	1	-	1	1	-	1
C116	3	2	2	1	1	3	-	1	1	1	-	1	1	-	1

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**DEPARTMENT OF CIVIL ENGINEERING**

**CO-PO MAPPING – 2017 REGULATION**

**III SEMESTER**

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### MA8353 - TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS

Course Code	Course Name	Course Outcome (CO) Students will be able to
MA8353	Transforms and Partial Differential Equations	<b>C201.1:</b> Discuss the basic concepts of PDE for solving standard partial differential equations.
		<b>C201.2:</b> Demonstrates the Fourier series analysis which is central to many applications in engineering.
		<b>C201.3:</b> Explain the Fourier series techniques in solving heat flow problems used in various situations.
		<b>C201.4:</b> Develop an understanding of the Fourier transform techniques used in wide variety of situations.
		<b>C201.5:</b> Comprehend the effective mathematical tools for the solutions of partial differential equations that model several physical processes.
		<b>C201.6:</b> Describe Z transform techniques for discrete time systems.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
MA8353															
C201.1	3	3	2	2	-	-	-	-	-	2	-	2	-	2	-
C201.2	3	3	2	2	-	-	-	-	-	2	-	2	-	2	-
C201.3	3	3	2	2	-	-	-	-	-	2	-	2	-	2	-
C201.4	3	3	2	2	-	-	-	-	-	2	-	2	-	2	-
C201.5	3	3	2	2	-	-	-	-	-	2	-	2	-	2	-
C201.6	3	3	2	2	-	-	-	-	-	2	-	2	-	2	-
C201	3	3	2	2	-	-	-	-	-	2	-	2	-	-	-

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8301-STRENGTH OF MATERIALS-I

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8301	Strength of Materials-I	<b>C202.1:</b> Explain the concepts of stress and strain, principal stresses and principal planes.
		<b>C202.2:</b> Determine Shear force and bending moment in beams and explain concept of theory of simple bending.
		<b>C202.3:</b> Calculate the deflection of beams by different methods and selection of method for determining slope or deflection.
		<b>C202.4:</b> Apply basic equation of torsion in design of circular shafts and helical springs.
		<b>C202.5:</b> Analyze the pin jointed plane trusses.
		<b>C202.6:</b> Analyze the pin jointed space trusses.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
CE8301																
C202.1	3	2	1	1	-	-	-	-	1	2	1	1	2	2	1	
C202.2	3	2	1	1	-	2	-	-	1	2	1	1	2	2	1	
C202.3	3	2	1	1	-	2	-	-	1	2	1	1	2	2	1	
C202.4	3	2	1	1	-	-	-	-	1	2	1	1	2	2	1	
C202.5	3	2	1	1	-	2	-	-	1	2	1	1	2	2	1	
C202.6	3	2	1	1	-	2	-	-	1	2	1	1	2	2	1	
C202	3	2	1	1	-	2	-	-	1	1	1	1	2	2	2	

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8302-FLUID MECHANICS

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8302	Fluid Mechanics	C203.1: Explain the terms fluids in static, kinematic and dynamic equilibrium.
		C203.2: Explain and solve the problems related to equation of motion.
		C203.3: Describe about dimensional and model analysis for water flow.
		C203.4: Explain the various types of flow and losses of flow in pipes.
		C203.5: Explain and solve the boundary layer problems.
		C203.6: Explain laminar and turbulent boundary layer.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8302															
C203.1	3	2	2	2	-	-	-	-	1	1	-	1	2	2	1
C203.2	3	2	2	2	-	-	-	-	1	1	-	1	2	2	1
C203.3	3	2	2	2	-	-	-	-	1	1	-	1	2	2	1
C203.4	3	2	2	2	-	2	-	-	-	1	-	1	2	2	-
C203.5	3	2	2	2	-	-	-	-	1	1	-	1	2	2	1
C203.6	3	2	2	2	-	-	-	-	1	1	-	1	2	2	1
C203	3	2	2	2	-	2	-	-	1	1	-	1	2	2	1

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8351-SURVEYING

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8351	Surveying	C204.1: Explain about the various surveying instruments and mapping.
		C204.2: Describe horizontal angle and vertical angle using different instruments.
		C204.3: Explain the various Methods of Leveling and setting Levels with different instruments.
		C204.4: Describe the Concepts of astronomical surveying and methods to determine time, longitude, latitude and azimuth.
		C204.5: Describe the Concept and principle of modern surveying.
		C204.6: Explain about the triangulation and traversing surveying.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8351															
C204.1	2	1	1	1	1	2	-	-	-	1	-	1	2	1	1
C204.2	2	1	1	1	1	2	-	-	-	1	-	1	2	1	1
C204.3	2	1	1	1	1	2	-	-	-	1	-	1	2	1	1
C204.4	2	1	1	1	-	2	-	-	-	1	-	1	2	1	1
C204.5	2	1	1	1	1	2	-	-	-	1	-	1	2	1	1
C204.6	2	1	1	1	1	2	-	-	-	1	-	1	2	1	1
C204	2	1	1	1	1	2	-	-	-	1	-	1	2	1	1

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8391-CONSTRUCTION MATERIALS

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8391	Construction Materials	<b>C205.1:</b> Compare the properties of most common and advanced building materials.
		<b>C205.2:</b> Explain about the typical and potential applications of lime, cement and aggregates.
		<b>C205.3:</b> Describe the production of concrete and also the method of placing and making of concrete elements.
		<b>C205.4:</b> Explain the applications of timbers and other materials.
		<b>C205.5:</b> Explain the importance of modern material for construction..
		<b>C205.6:</b> Describe the applications of laminar composites.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8391															
C205.1	2	2	1	1	-	1	-	-	1	1	1	1	1	1	2
C205.2	2	2	1	1	-	1	-	-	1	1	1	1	1	1	2
C205.3	2	2	1	1	-	1	-	-	1	1	1	1	1	1	2
C205.4	2	2	1	1	-	-	-	-	1	1	1	1	1	1	2
C205.5	2	2	1	1	-	-	-	-	1	1	1	1	1	1	2
C205.6	2	2	1	1	-	-	-	-	1	1	1	1	1	1	2
C205	2	2	1	1	-	1	-	-	1	1	1	1	1	1	2

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8392-ENGINEERING GEOLOGY

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8392	Engineering Geology	<b>C206.1:</b> Explain the importance of geological knowledge such as earth, earthquake, volcanism and the action of various geological agencies.
		<b>C206.2:</b> Explain about the properties of minerals.
		<b>C206.3:</b> Describe about the types of rocks, their distribution and uses.
		<b>C206.4:</b> Explain the methods of study on geological structure.
		<b>C206.5:</b> Explain the application of geological investigation in projects such as dams, tunnels, bridges, roads, airport and harbor
		<b>C206.6:</b> Explain the application of geological investigation in coastal protection structures

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8392															
C206.1	2	1	1	1	-	-	-	-	2	1	-	1	-	-	1
C206.2	2	1	1	1	1	1	-	-	2	1	-	1	1	1	1
C206.3	2	1	1	1	1	1	-	-	2	1	-	1	1	1	1
C206.4	2	1	1	1	1	1	-	-	2	1	-	1	1	1	1
C206.5	2	1	1	1	-	-	-	-	2	1	-	1	1	1	1
C206.6	2	1	1	1	-	-	-	-	2	1	-	1	1	1	1
C206	2	1	1	1	1	1	-	-	2	1	-	1	1	1	1

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# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8311-CONSTRUCTION MATERIALS LABORATORY

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8311	Construction Materials Laboratory	C207.1: Describe the area of testing of construction materials experimentally.
		C207.2: Explain about the testing of components of construction elements experimentally.
		C207.3: Explain the behaviour of the construction materials.
		C207.4: Determine the water absorption and Efflorescence of bricks.
		C207.5: Determine the Compressive strength for Cube & Cylinder.
		C207.6: Determine the impact value and crushing value of coarse aggregate.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8311															
C207.1	2	2	1	1	-	1	-	1	1	1	1	1	2	2	1
C207.2	2	2	1	1	-	1	-	1	1	1	1	1	2	2	1
C207.3	2	2	1	1	-	1	-	1	1	1	1	1	2	2	1
C207.4	2	2	1	1	-	1	-	1	1	1	1	1	2	2	1
C207.5	2	2	1	1	-	1	-	1	1	1	1	1	2	2	1
C207.6	2	2	1	1	-	1	-	1	1	1	1	1	2	2	1
C207	2	2	1	1	-	1	-	1	1	1	1	1	2	2	1

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8361 SURVEYING LABORATORY

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8361	Surveying Laboratory	<b>C208.1:</b> Describe the handling methods of basic survey instruments including Theodolite & Tacheometry
		<b>C208.2:</b> Explain Triangulation and Astronomical surveying including general field marking for various Engineering projects and Location of site etc.
		<b>C208.3:</b> Describe about the determination of distance and difference in elevation between two inaccessible points using total station.
		<b>C208.4:</b> Explain about Total Station and GPS
		<b>C208.5:</b> Determine the elevation of an object using single plane method when base is accessible/inaccessible.
		<b>C208.6:</b> Determine the height and distance by Tangential and Stadia Tacheometry

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
CE8361																
C208.1	2	1	1	1	1	2	-	1	1	1	1	1	1	2	1	
C208.2	2	1	1	1	-	2	-	1	1	1	1	1	1	2	1	
C208.3	2	1	1	1	1	2	-	1	1	1	1	1	1	2	1	
C208.4	2	1	1	1	1	2	-	1	1	1	1	1	1	2	1	
C208.5	2	1	1	1	-	2	-	1	1	1	1	1	1	2	1	
C208.6	2	1	1	1	-	2	-	1	1	1	1	1	1	2	1	
C208	2	1	1	1	1	2	-	1	1	1	1	1	1	2	1	

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### HS8381-INTERPERSONAL SKILLS/LISTENING & SPEAKING

Course Code	Course Name	Course Outcome (CO) Students will be able to
HS8381	Interpersonal Skills/Listening & Speaking	C209.1: Listen and respond appropriately
		C209.2: Participate in group discussions
		C209.3: Develop communication skills.
		C209.4: Participate confidently and appropriately in conversations both formal and informal
		C209.5: Improve general and academic listening skills
		C209.6: Prepare effective presentations

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
HS8381															
C209.1	-	-	-	-	-	-	-	3	1	2	1	1	-	-	-
C209.2	-	-	-	-	-	-	-	3	1	2	1	1	-	-	-
C209.3	-	-	-	-	-	-	-	3	1	2	1	1	-	-	-
C209.4	-	-	-	-	-	-	-	3	1	2	1	1	-	-	-
C209.5	-	-	-	-	-	-	-	3	1	2	1	1	-	-	-
C209.6	-	-	-	-	-	2	-	3	1	2	1	1	-	-	-
C209	-	-	-	-	-	2	-	3	1	2	1	1	-	-	-

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**DEPARTMENT OF CIVIL ENGINEERING**

**CO-PO MAPPING – 2017 REGULATION**

# **IV SEMESTER**

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### MA8491-NUMERICAL METHODS

Course Code	Course Name	Course Outcome (CO) Students will be able to
MA8491	Numerical Methods	<b>C210.1:</b> Comprehend the basic concepts of solving algebraic and transcendental equations.
		<b>C210.2:</b> Discuss the numerical techniques of interpolation in various intervals in real life situations.
		<b>C210.3:</b> Explain the numerical techniques of differentiation.
		<b>C210.4:</b> Develop an understanding of the integration which plays an important role in engineering and technology disciplines.
		<b>C210.5:</b> Carry out the various techniques and methods of solving ordinary differential equations.
		<b>C210.6:</b> Describe about the various techniques and methods of solving various types of partial differential equations.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
MA8491															
C210.1	3	3	3	2	-	-	-	-	-	2	-	2	-	2	-
C210.2	3	3	3	2	-	-	-	-	-	2	-	2	-	2	-
C210.3	3	3	3	2	-	-	-	-	-	2	-	2	-	2	-
C210.4	3	3	3	2	-	-	-	-	-	2	-	2	-	2	-
C210.5	3	3	3	2	-	-	-	-	-	2	-	2	-	2	-
C210.6	3	3	3	2	-	-	-	-	-	2	-	2	-	2	-
C210	3	3	3	2	-	-	-	-	-	2	-	2	-	2	-

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8401 CONSTRUCTION TECHNIQUES AND PRACTICES

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8401	Construction Techniques and Practices	C211.1: Describe the different construction techniques and structural systems
		C211.2: Explain various techniques and practices on masonry construction, flooring, and roofing.
		C211.3: Explain the requirements for substructure construction.
		C211.4: Describe the methods and techniques involved in the construction of various types of super structures
		C211.5: Selection, maintenance and operation of hand held power tools and equipments used in the building construction sites.
		C211.6: Describe the usage of various equipments for dredging, trenching and tunneling

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8401															
C211.1	2	1	1	1	-	2	-	-	1	1	1	1	1	1	2
C211.2	2	1	1	1	-	2	-	-	1	1	1	1	1	1	2
C211.3	2	1	1	1	-	-	-	-	1	1	1	1	1	1	2
C211.4	2	1	1	1	-	2	-	-	1	1	1	1	1	1	2
C211.5	2	1	1	1	-	2	-	-	1	1	1	1	1	1	2
C211.6	2	1	1	1	-	2	-	-	1	1	1	1	1	1	2
C211	2	1	1	1	-	2	-	-	1	1	1	1	1	1	2

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8402 STRENGTH OF MATERIALS II

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8402	Strength of Materials II	C212.1: Determine the strain energy and compute the deflection of determinate beams, frames and trusses using energy principles.
		C212.1: Analyze propped cantilever, fixed beams and continuous beams using theorem of three moment equation for external loadings and support settlements.
		C212.1: Find the load carrying capacity of columns and stresses induced in columns and cylinders
		C212.1: Determine principal stresses and planes for an element in three dimensional state of stress and study various theories of failure
		C212.1: Determine the stresses due to Unsymmetrical bending of beams, locate the shear center.
		C212.1: Determine the stresses in curved beams.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8402															
C212.1	3	2	2	2	-	1	-	-	1	1	-	1	2	2	1
C212.2	3	2	2	2	-	-	-	-	1	1	-	1	2	2	1
C212.3	3	2	2	2	-	1	-	-	1	1	-	1	2	2	1
C212.4	3	2	2	2	-	-	-	-	1	1	-	1	2	2	1
C212.5	3	2	2	2	-	-	-	-	1	1	-	1	2	2	1
C212.6	3	2	2	2	-	-	-	-	1	1	-	1	2	2	1
C212	3	2	2	2	-	1	-	-	1	1	1	1	2	2	1

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8403 APPLIED HYDRAULIC ENGINEERING

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8403	Applied Hydraulic Engineering	C213.1: Apply the knowledge of fluid mechanics in addressing problems in open channels.
		C213.2: Identify an effective section for flow in different cross sections in pipes.
		C213.3: Solve problems in uniform, gradually and rapidly varied flows in steady state conditions.
		C213.4: Explain the principles, working and application of turbines.
		C213.5: Explain the principles, working and application of pumps.
		C213.6: Explain the concept of Air vessels, indicator diagrams and its variations

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
CE8403																
C213.1	3	2	1	1	-	1	-	-	1	1	-	1	2	2	1	
C213.2	3	2	1	1	-	-	-	-	1	1	-	1	2	2	1	
C213.3	3	2	1	1	-	-	-	-	1	1	-	1	2	2	1	
C213.4	3	2	1	1	-	1	-	-	1	1	-	1	2	2	1	
C213.5	3	2	1	1	-	1	-	-	1	1	-	1	2	2	1	
C213.6	3	2	1	1	-	-	-	-	1	1	-	1	2	2	1	
C213	3	2	1	1	-	1	-	-	1	1	-	1	2	2	1	

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8404 CONCRETE TECHNOLOGY

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8404	Concrete Technology	C214.1: Identify the various requirements of cement, aggregates and water for making concrete
		C214.2: Describe the effect of admixtures on properties of concrete
		C214.3: Explain the concept and procedure of mix design as per IS method
		C214.4: Illustrate the properties of concrete at fresh and hardened state
		C214.5: Explain about the importance of special concretes in various environmental conditions
		C214.6: Explain the application of various special concrete

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8404															
C214.1	2	2	1	1	-	-	-	-	2	1	1	1	1	1	2
C214.2	2	2	1	1	-	1	-	-	2	1	1	1	1	1	2
C214.3	2	2	1	1	-	1	-	-	2	1	1	1	1	1	2
C214.4	2	2	1	1	-	1	-	-	2	1	1	1	1	1	2
C214.5	2	2	1	1	-	-	-	-	2	1	1	1	1	1	2
C214.6	2	2	1	1	-	-	-	-	2	1	1	1	1	1	2
C214	2	2	1	1	-	1	-	-	2	1	1	1	1	1	2

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8491 SOIL MECHANICS

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8491	Soil Mechanics	C215.1: Classify the soil and assess the engineering properties, based on index properties
		C215.2: Explain the stress concepts in soils
		C215.3: Explain and identify the settlement in soils.
		C215.4: Determine the shear strength of soil
		C215.5: Analyze both finite and infinite slopes.
		C215.6: Explain about the guidelines for location of critical slope surface in cohesive soils

#### CO-PO MAPPING

CO	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8491															
C215.1	3	2	2	1	1	1	-	-	1	1	1	1	2	1	1
C215.2	3	2	2	1	-	-	-	-	1	1	1	1	2	1	1
C215.3	3	2	2	1	1	1	-	-	1	1	1	1	2	1	1
C215.4	3	2	2	1	1	1	-	-	1	1	1	1	2	1	1
C215.5	3	2	2	1	-	-	-	-	1	1	1	1	2	1	1
C215.6	3	2	2	1	-	-	-	-	1	1	1	1	2	1	1
C215	3	2	2	1	1	1	-	-	1	1	1	1	2	1	1

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8481 STRENGTH OF MATERIALS LABORATORY

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8481	Strength of Materials Laboratory	C216.1: Explain about the testing of materials under the action of various forces.
		C216.2: Determine the strength of various structural elements.
		C216.3: Explain the tensile and torsion test on steel rod
		C216.4: Describe the hardness test on metals (Rockwell and Brinell Hardness Tests)
		C216.5: Determine the deflection value for metal beam and carriage spring
		C216.6: Determine the deflection value for helical spring

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8481															
C216.1	3	2	2	1	-	1	-	1	2	1	1	1	2	2	1
C216.2	3	2	2	1	-	1	-	1	2	1	1	1	2	2	1
C216.3	3	2	2	1	-	1	-	1	2	1	1	1	2	2	1
C216.4	3	2	2	1	-	1	-	1	2	1	1	1	2	2	1
C216.5	3	2	2	1	-	1	-	1	2	1	1	1	2	2	1
C216.6	3	2	2	1	-	1	-	1	2	1	1	1	2	2	1
C216	3	2	2	1	-	1	-	1	1	1	1	1	2	2	1

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8461 HYDRAULIC ENGINEERING LABORATORY

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8461	Hydraulic Engineering Laboratory	C217.1: Explain the measurement of flow in pipes .
		C217.2: Develop characteristics curves in various types of pumps.
		C217.3: Explain about the types of turbines and its characteristic curve.
		C217.4: Determine frictional losses in pump and turbines.
		C217.5: Determine the metacentric height.
		C217.6: Illustrate the calibration of venturimeter / orificemeter and rotameter

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8461															
C217.1	3	2	2	1	-	1	-	1	1	1	-	-	1	1	2
C217.2	3	2	2	1	-	-	-	1	1	1	-	-	1	1	2
C217.3	3	2	2	1	-	-	-	1	1	1	-	-	1	1	2
C217.4	3	2	2	1	-	1	-	1	1	1	-	-	1	1	2
C217.5	3	2	2	1	-	1	-	1	1	1	-	-	1	1	2
C217.6	3	2	2	1	-	1	-	1	1	1	-	-	1	1	2
C217	3	2	2	1	-	1	-	1	1	1	-	-	1	1	2

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### HS8461 ADVANCED READING AND WRITING

Course Code	Course Name	Course Outcome (CO) Students will be able to
HS8461	Advanced Reading and Writing	C218.1: Apply effective reading skills
		C218.2: Write different types of essays.
		C218.3: Write winning job applications
		C218.4: Demonstrate critical thinking in various professional contexts.
		C218.5: Apply critical thinking to evaluate the text read .
		C218.6: Develop their project and proposal writing skills

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
HS8461															
C218.1	-	-	-	-	-	-	-	2	1	2	-	1	-	-	-
C218.2	-	-	-	-	-	-	-	2	1	2	-	1	-	-	-
C218.3	-	-	-	-	-	-	-	2	1	2	-	1	-	-	-
C218.4	-	-	-	-	-	1	-	2	1	2	-	1	-	-	-
C218.5	-	-	-	-	-	-	-	2	1	2	-	1	-	-	-
C218.6	-	-	-	-	-	-	-	2	1	2	-	1	-	-	-
C218	-	-	-	-	-	1	-	2	1	2	-	1	-	-	-

\*3-High Correlation; 2-Medium Correlation; 1-Low Correlation

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**DEPARTMENT OF CIVIL ENGINEERING**

**CO-PO MAPPING – 2017 REGULATION**

**V SEMESTER**

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8501-DESIGN OF REINFORCED CEMENT CONCRETE ELEMENTS

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8501	Design of Reinforced Cement Concrete Elements	<b>C301.1:</b> Explain the various design methodologies for the design of RC elements
		<b>C301.2:</b> Describe about the analysis and design of flanged beams by limit state method and sign of beams for shear, bond and torsion.
		<b>C301.3:</b> Design the various types of slabs and staircase by limit state method.
		<b>C301.4:</b> Design columns for axial, uniaxial and biaxial eccentric loadings.
		<b>C301.5:</b> Explain the concept of proportioning footings and foundations based on soil properties
		<b>C301.6:</b> Design of footing by limit state method.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8501															
C301.1	3	3	3	3	-	-	-	-	2	1	1	1	2	2	1
C301.2	3	3	3	3	-	2	-	-	2	1	1	1	2	2	1
C301.3	3	3	3	3	-	2	-	-	2	1	1	1	2	2	1
C301.4	3	3	3	3	-	2	-	-	2	1	1	1	2	2	1
C301.5	3	3	3	3	-	-	-	-	2	1	1	1	2	2	1
C301.6	3	3	3	3	-	2	-	-	2	1	1	1	2	2	1
C301	3	3	3	3	-	2	-	-	2	1	1	1	2	2	1

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8502-STRUCTURAL ANALYSIS I

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8502	Structural Analysis I	<b>C302.1:</b> Analyze continuous beams, pin-jointed indeterminate plane frames and rigid plane frames by strain energy method
		<b>C302.2:</b> Analyse the continuous beams and rigid frames by slope deflection method.
		<b>C302.3:</b> Explain the concept of moment distribution and analysis of continuous beams and rigid frames with and without sway.
		<b>C302.4:</b> Analyse the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method.
		<b>C302.5:</b> Explain the concept of matrix stiffness method and analysis of continuous beams.
		<b>C302.6:</b> Analyse the pin jointed trusses and rigid plane frames using matrix stiffness method

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8502															
C302.1	3	3	2	1	-	1	-	-	2	1	1	1	2	2	1
C302.2	3	3	2	1	-	1	-	-	2	1	1	1	2	2	1
C302.3	3	3	2	1	-	1	-	-	2	1	1	1	2	2	1
C302.4	3	3	2	1	-	1	-	-	2	1	1	1	2	2	1
C302.5	3	3	2	1	-	-	-	-	2	1	1	1	2	2	1
C302.6	3	3	2	1	-	-	-	-	2	1	1	1	2	2	1
C302	3	3	2	1	-	1	-	-	2	1	1	1	2	2	1

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### EN8491-WATER SUPPLY ENGINEERING

Course Code	Course Name	Course Outcome (CO) Students will be able to
EN8491	Water Supply Engineering	C303.1: Explain the types of drinking water supply systems, including water transport, treatment and distribution
		C303.2: Describe the various unit operations and processes in water treatment
		C303.3: Design the various functional units in water treatment
		C303.4: Explain about the various water quality criteria and its standards, and their relation to public health
		C303.5: Design and evaluate water supply project alternatives on basis of chosen criteria.
		C303.6: Explain the components about requirements and components of water distributions.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
EN8491																
C303.1	2	2	1	1	-	2	1	-	-	-	-	1	2	2	2	
C303.2	2	2	1	1	-	2	1	-	-	-	-	1	2	2	2	
C303.3	2	2	1	1	-	2	1	-	-	-	-	1	2	2	2	
C303.4	2	2	1	1	-	2	1	-	-	-	-	1	2	2	2	
C303.5	2	2	1	1	-	2	1	-	-	-	-	1	2	2	2	
C303.6	2	2	1	1	-	2	1	-	-	-	-	1	2	2	2	
C303	2	2	1	1	-	2	1	-	-	-	-	1	2	2	2	

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8591-FOUNDATION ENGINEERING

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8591	Foundation Engineering	C304.1: Explain the site investigation, methods and sampling.
		C304.2: Explain the bearing capacity and testing methods.
		C304.3: Design shallow footings.
		C304.4: Determine the load carrying capacity, settlement of pile foundation.
		C304.5: Determine the earth pressure on retaining walls using various theories
		C304.6: Determine the stability analysis of retaining walls

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
CE8591																
C304.1	3	2	1	1	-	-	2	1	1	3	1	1	3	2	2	
C304.2	3	2	1	1	-	-	2	1	1	3	1	1	3	2	2	
C304.3	3	2	1	1	-	-	2	1	1	3	1	1	3	2	2	
C304.4	3	2	1	1	-	-	2	1	1	3	1	1	3	2	2	
C304.5	3	2	1	1	-	-	2	1	1	3	1	1	3	2	2	
C304.6	3	2	1	1	-	-	2	1	1	3	1	1	3	2	2	
C304	3	2	1	1	-	-	2	1	1	3	1	1	3	3	2	

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### GE8074-HUMAN RIGHTS

Course Code	Course Name	Course Outcome (CO) Students will be able to
GE8074	HUMAN RIGHTS	C305.1: Explain the basic knowledge of human rights.
		C305.2: Describe about natural, moral and legal rights.
		C305.3: Analyse the concept of Human Rights Magana carta.
		C305.4: Explain the perspectives of UN Laws.
		C305.5: Analyse the concept of Human Rights of Disadvantaged People.
		C305.6: Apply the implementation of Human Rights .

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
GE8074															
C305.1	2	1	1	1	-	2	2	2	1	1	1	-	-	1	2
C305.2	2	1	1	1	-	2	2	2	1	1	1	-	-	1	2
C305.3	2	1	1	1	-	2	2	2	1	1	1	-	-	1	2
C305.4	2	1	1	1	-	2	2	2	1	1	1	-	-	1	2
C305.5	2	1	1	1	-	2	2	2	1	1	1	-	-	1	2
C305.6	2	1	1	1	-	2	2	2	1	1	1	-	-	1	2
C305	2	1	1	1		2	2	2	1	1	1	-	-	1	2

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### ORO551-RENEWABLE ENERGY SOURCES

Course Code	Course Name	Course Outcome (CO) Students will be able to
ORO551	Renewable Energy Sources	C306.1: Explain the physics of solar radiation.
		C306.2: Classify the solar energy collectors and methodologies of storing solar energy.
		C306.3: Apply the usage of solar energy in real world problems to generate electrical power .
		C306.4: Explain the requirements of wind energy and biomass with its economic aspects.
		C306.5: Describe the methods of capturing and applying other forms of energy sources like wind, biogas and geothermal energies to generate electrical power.
		C306.6: Explain the direct form of energy conversion methods.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
ORO551															
C306.1	3	2	1	1	-	-	-	-	2	1	-	-	2	2	1
C306.2	3	2	1	1	-	-	-	-	2	1	-	-	2	2	1
C306.3	3	2	1	1	1	-	-	-	2	1	-	-	2	2	1
C306.4	3	2	1	1	1	-	-	-	2	1	-	-	2	2	1
C306.5	3	2	1	1	-	-	-	-	2	1	-	-	2	2	1
C306.6	3	2	1	1	-	-	-	-	2	1	-	-	2	2	1
C306	3	2	1	1	1	-	-	-	2	1	-	-	2	2	1

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8511-SOIL MECHANICS LABORATORY

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8511	Soil Mechanics Laboratory	C307.1: Conduct tests to determine both the index and engineering properties of soils.
		C307.2: Characterize the soil based on their properties.
		C307.3: Determine insitu density and compaction characteristics.
		C307.4: Describe the determination of relative density.
		C307.5: Explain the unconfined compression test and vane shear test in cohesive soil.
		C307.6: Determine the moisture – density relationship using standard Proctor compaction test.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8511															
C307.1	3	2	2	1	1	1	-	1	1	-	1	1	1	1	2
C307.2	3	2	2	1	1	1	-	1	1	-	1	1	1	1	2
C307.3	3	2	2	1	-	1	-	1	1	-	1	1	1	1	2
C307.4	3	2	2	1	-	1	-	1	1	-	1	1	1	1	2
C307.5	3	2	2	1	-	1	-	1	1	-	1	1	1	1	2
C307.6	3	2	2	1	-	-	-	1	1	-	1	1	1	1	2
C307	3	2	2	1	1	1	-	1	1	-	1	1	1	1	2

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8512-WATER AND WASTE WATER ANALYSIS LABORATORY

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8512	Water and waste water analysis laboratory	C308.1: Explain the pollutant concentration in water and wastewater.
		C308.2: Describe the type of treatment required and amount of dosage required for waste water treatment.
		C308.3: Examine the conditions for the growth of micro-organisms.
		C308.4: Analyse the physical, chemical and biological characteristics of water and waste water.
		C308.5: Perform coliform analysis.
		C308.6: Perform pathogenic and non pathogenic analysis.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
CE8512																
C308.1	3	2	1	1	-	2	-	1	2	1	1	1	1	1	2	
C308.2	3	2	1	1	-	-	-	1	2	1	1	1	-	1	2	
C308.3	3	2	1	1	-	-	-	1	2	1	1	1	-	1	2	
C308.4	3	2	1	1	-	2	-	1	2	1	1	1	1	1	2	
C308.5	3	2	1	1	-	2	-	1	2	1	1	1	1	1	2	
C308.6	3	2	1	1	-	2	-	1	2	1	1	1	1	1	2	
C308	3	2	1	1	-	2	-	1	1	1	1	1	1	1	2	

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8513-SURVEY CAMP

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8513	Survey Camp	C309.1: Explain about the radial tachometric contouring
		C309.2: Determine latitude and longitude and locate the survey camp location using GPS
		C309.3: Describe about the curve setting by deflection angle
		C309.4: Explain the location of offset for buildings
		C309.5: Describe the principles of traversing using GPS
		C309.6: Explain L.S & C.S survey for road and canal alignment

#### CO-PO MAPPING

CO	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8513															
C309.1	3	2	1	1	-	-	-	1	1	2	1	1	1	-	1
C309.2	3	2	1	1	1	2	-	1	1	2	1	1	1	-	1
C309.3	3	2	1	1	-	-	-	1	1	2	1	1	1	-	1
C309.4	3	2	1	1	-	2	-	1	1	2	1	1	1	-	1
C309.5	3	2	1	1	-	2	-	1	1	2	1	1	1	-	1
C309.6	3	2	1	1	1	-	-	1	1	2	1	1	1	-	1
C309	3	2	1	1	1	2	-	1	1	2	1	1	1	-	1

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**DEPARTMENT OF CIVIL ENGINEERING**

**CO-PO MAPPING – 2017 REGULATION**

# **VI SEMESTER**

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8601-DESIGN OF STEEL STRUCTURAL ELEMENTS

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8601	Design of Steel Structural Elements	C310.1: Explain the concepts of various design philosophies
		C310.2: Design common bolted and welded connections for steel structures
		C310.3: Design tension members and explain the effect of shear lag.
		C310.4: Explain the design concept of axially loaded columns and column base connections.
		C310.5: Explain about the specific problems related to the design of laterally restrained and unrestrained steel beams.
		C310.6: Design of purlin in roof trusses and also design channel and I section purlins

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
CE8601																
C310.1	3	3	3	2	-	-	-	-	1	2	-	1	3	2	2	
C310.2	3	3	3	2	-	-	-	-	1	2	-	1	3	2	2	
C310.3	3	3	3	2	-	-	-	-	1	2	-	1	3	2	2	
C310.4	3	3	3	2	-	-	-	-	1	2	-	1	3	2	2	
C310.5	3	3	3	2	-	-	-	-	1	2	-	1	3	2	2	
C310.6	3	3	3	2	-	-	-	-	1	2	-	1	3	2	2	
C310	3	3	3	2	-	-	-	-	1	2	-	1	3	2	2	

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\*3-High Correlation; 2-Medium Correlation; 1-Low Correlation

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8602-STRUCTURAL ANALYSIS II

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8602	Structural Analysis II	C311.1: Draw influence lines for statically determinate structures and calculate critical stress resultants.
		C311.2: Explain Muller Breslau principle and draw the influence lines for statically indeterminate beams.
		C311.3: Analyse three hinged, two hinged and fixed arches.
		C311.4: Analyse the suspension bridges with stiffening girders.
		C311.5: Explain the concept of plastic analysis and find plastic moment capacity for beams and rigid frames.
		C311.6: Determine plastic moment of resistance and shape factor for various sections.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8602															
C311.1	3	3	2	2	-	1	-	-	2	1	1	1	2	2	1
C311.2	3	3	2	2	-	1	-	-	2	1	1	1	2	2	1
C311.3	3	3	2	2	-	-	-	-	2	1	1	1	2	2	1
C311.4	3	3	2	2	-	-	-	-	2	1	1	1	2	2	1
C311.5	3	3	2	2	-	-	-	-	2	1	1	1	2	2	1
C311.6	3	3	2	2	-	-	-	-	2	1	1	1	2	2	1
C311	3	3	2	2	-	1	-	-	2	1	1	1	2	2	1

\*3-High Correlation; 2-Medium Correlation; 1-Low Correlation

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8603-IRRIGATION ENGINEERING

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8603	Irrigation Engineering	C312.1: Describe crop water requirements.
		C312.2: Explain the methods and management of irrigation.
		C312.3: Explain types of Impounding structures.
		C312.4: Describe the various methods of irrigation including canal irrigation
		C312.5: Describe water management on optimization of water use.
		C312.6: Illustrate water resources association.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
CE8603																
C312.1	3	2	1	1	-	2	1	-	1	1	-	1	3	2	2	
C312.2	3	2	1	1	-	2	1	-	1	1	-	1	3	2	2	
C312.3	3	2	1	1	-	2	1	-	1	1	-	1	3	2	2	
C312.4	3	2	1	1	-	2	1	-	1	1	-	1	3	2	2	
C312.5	3	2	1	1	-	2	1	-	1	1	-	1	3	2	2	
C312.6	3	2	1	1	-	2	1	-	1	1	-	1	3	2	2	
C312	3	2	1	1	-	2	1	-	1	1	-	1	3	2	2	

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8604-HIGHWAY ENGINEERING

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8604	Highway Engineering	C313.1: Explain about the planning and alignment of highway.
		C313.2: Describe the Geometric design of highways
		C313.3: Design flexible and rigid pavements.
		C313.4: Explain Highway construction materials, properties, testing methods
		C313.5: Explain the concept of pavement management system, evaluation of distress and maintenance of pavements.
		C313.6: Describe about the various methods for strengthening of pavements

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
CE8604																
C313.1	3	2	2	2	-	1	-	-	1	1	1	1	2	1	1	
C313.2	3	2	2	2	-	1	-	-	1	1	1	1	2	1	1	
C313.3	3	2	2	2	-	1	-	-	1	1	1	1	2	1	1	
C313.4	3	2	2	2	-	1	-	-	1	1	1	1	2	1	1	
C313.5	3	2	2	2	-	1	-	-	1	1	1	1	2	1	1	
C313.6	3	2	2	2	-	1	-	-	1	1	1	1	2	1	1	
C313	3	2	2	2	-	1	-	-	1	1	1	1	2	1	1	

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### EN8592-WASTEWATER ENGINEERING

Course Code	Course Name	Course Outcome (CO) Students will be able to
EN8592	Wastewater Engineering	C314.1: Explain about the sewage generation and design sewer system including sewage pumping stations
		C314.2: Describe the various characteristics and composition of sewage, self purification of streams
		C314.3: Perform basic design of the unit operations and processes that are used in sewage treatment
		C314.4: Explain about the standard methods for disposal of sewage.
		C314.5: Describe about the process of sludge treatment and disposal.
		C314.6: Explain about sludge conditioning and dewatering

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
EN8592															
C314.1	3	2	1	1	-	-	-	2	1	-	-	1	3	2	2
C314.2	3	2	1	1	-	-	-	2	1	-	-	1	3	2	2
C314.3	3	2	1	1	-	-	-	2	1	-	-	1	3	2	2
C314.4	3	2	1	1	-	-	-	2	1	-	-	1	3	2	2
C314.5	3	2	1	1	-	-	-	2	1	-	-	1	3	2	2
C314.6	3	2	1	1	-	-	-	2	1	-	-	1	3	2	2
C314	3	2	1	1	-	-	-	2	1	-	-	1	3	2	2

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8005-AIR POLLUTION AND CONTROL ENGINEERING

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8005	Air Pollution and Control Engineering	C315.1: Identify the nature and characteristics of air pollutants, noise pollution and basic concepts of air quality management
		C315.2: Identify, formulate and solve air and noise pollution problems
		C315.3: Design stacks and particulate air pollution control devices to meet applicable standards.
		C315.4: Select control equipments.
		C315.5: Ensure quality, control and preventive measures.
		C315.6: Explain about the sick building syndrome and building related illness

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8005															
C315.1	2	2	1	1	-	-	-	-	2	1	-	-	1	1	2
C315.2	2	2	1	1	-	-	-	-	2	1	-	-	1	1	2
C315.3	2	2	1	1	-	-	-	-	2	1	-	-	1	1	2
C315.4	2	2	1	1	-	-	-	-	2	1	-	-	1	1	2
C315.5	2	2	1	1	-	-	-	-	2	1	-	-	1	1	2
C315.6	2	2	1	1	-	-	-	-	2	1	-	-	1	1	2
C315	2	2	1	1	-	-	-	-	2	1	-	-	1	1	2

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8611-HIGHWAY ENGINEERING LABORATORY

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8611	Highway Engineering Laboratory	C316.1: Describe about the various pavement materials through relevant tests.
		C316.2: Explain about various test on aggregates
		C316.3: Perform specific gravity and viscosity test for bitumen
		C316.4: Perform Marshall Stability and Flow Values on bituminous mixes
		C316.5: Determine stripping value and binder content on bituminous mixes
		C316.6: Perform penetration and Softening Point Test for bitumen

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8611															
C316.1	3	2	2	1	-	1	-	1	2	1	1	1	1	1	2
C316.2	3	2	2	1	-	1	-	1	2	1	1	1	1	1	2
C316.3	3	2	2	1	-	1	-	1	2	1	1	1	1	1	2
C316.4	3	2	2	1	-	1	-	1	2	1	1	1	1	1	2
C316.5	3	2	2	1	-	1	-	1	2	1	1	1	1	1	2
C316.6	3	2	2	1	-	1	-	1	2	1	1	1	1	1	2
C316	3	2	2	1	-	1	-	1	2	1	1	1	1	1	2

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8612-IRRIGATION AND ENVIRONMENTAL ENGINEERING DRAWING

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8612	Irrigation and Environmental Engineering Drawing	C317.1: Design and draw various units of Municipal water treatment plants.
		C317.2: Design and draw various units of sewage treatment plants.
		C317.3: Design tank components
		C317.4: Explain about the various types of impounding structures
		C317.5: Design cross drainage works and canal regulation structures
		C317.6: Explain the concept of design of irrigation structures.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
CE8612																
C317.1	3	3	2	2	-	-	-	1	1	1	-	1	2	2	1	
C317.2	3	3	2	2	-	-	-	1	1	1	-	1	2	2	1	
C317.3	3	3	2	2	-	-	-	1	1	1	-	1	2	2	1	
C317.4	3	3	2	2	-	-	-	1	1	1	-	1	2	-	1	
C317.5	3	3	2	2	-	-	-	1	1	1	-	1	2	2	1	
C317.6	3	3	2	2	-	-	-	1	1	1	-	1	2	-	1	
C317	3	3	2	2	-	-	-	1	1	1	-	1	2	2	1	

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### HS8581-PROFESSIONAL COMMUNICATION

Course Code	Course Name	Course Outcome (CO) Students will be able to
HS8581	Professional Communication	C318.1: Explain about the corporate etiquette -organizing and managing professional events and will comprehend how reading will enhances their communicative competency.
		C318.2: Discuss about the making of effective communication and presentations.
		C318.3: Describe adequate soft skills required for the workplace.
		C318.4: Build good relation with Business correspondence.
		C318.5: Develop all around personalities with a mature outlook to function effectively in different circumstances.
		C318.6: Construct their confidence and help the attend interviews successfully.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
HS8581															
C318.1	-	-	-	-	-	-	-	-	3	3	3	-	-	-	-
C318.2	-	-	-	-	-	-	-	-	3	3	3	-	-	-	-
C318.3	-	-	-	-	-	-	-	-	3	3	3	-	-	-	-
C318.4	-	-	-	-	-	-	-	-	3	3	3	-	-	-	-
C318.5	-	-	-	-	-	-	-	-	3	3	3	-	-	-	-
C318.6	-	-	-	-	-	-	-	-	3	3	3	-	-	-	-
C318	-	-	-	-	-	-	-	-	3	3	3	-	-	-	-

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DEPARTMENT OF CIVIL ENGINEERING

CO-PO MAPPING – 2017 REGULATION

**VII SEMESTER**

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8701-ESTIMATION,COSTING AND VALUATION ENGINEERING

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8701	Estimation, Costing and Valuation Engineering	C401.1: Illustrate about the quantities required for building construction.
		C401.2: Describe about the rate analysis for all building works, canals, and roads and cost estimate.
		C401.3: Explain types of specifications, principles for report preparation, tender notices types.
		C401.4: Explain various types of contracts
		C401.5: Evaluate valuation for building and land.
		C401.6: Calculate rent, mortgage and lease value for buildings

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8701															
C401.1	3	2	1	1	-	1	-	-	2	1	1	1	2	2	1
C401.2	3	2	1	1	-	1	-	-	2	1	1	1	2	2	1
C401.3	3	2	1	1	-	-	-	-	2	1	1	1	2	2	1
C401.4	3	2	1	1	-	-	-	-	2	1	1	1	2	2	1
C401.5	3	2	1	1	-	1	-	-	2	1	1	1	2	2	1
C401.6	3	2	1	1	-	1	-	-	2	1	1	1	2	2	1
C401	3	2	1	1	-	1	-	-	2	1	1	1	2	2	1

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8702-RAILWAYS, AIRPORTS, DOCKS AND HARBOUR ENGINEERING

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8702	Railways, Airports, Docks and Harbour Engineering	C402.1: Explain the methods of route alignment and design elements in Railway Planning and Constructions.
		C402.2: Explain the Construction techniques and Maintenance of Track laying and Railway stations.
		C402.3: Describe about the site selection of Airport Planning and designing.
		C402.4: Analyze and design the elements for orientation of runways and passenger facility systems.
		C402.5: Explain the various features in Harbours and Ports.
		C402.6: Explain about the harbour and port construction, coastal protection works and coastal Regulations to be adopted.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
CE8702																
C402.1	2	2	1	1	-	-	-	-	1	1	1	1	2	2	1	
C402.2	2	2	1	1	-	-	-	-	1	1	1	1	2	2	1	
C402.3	2	2	1	1	-	-	-	-	1	1	1	1	2	2	1	
C402.4	2	2	1	1	-	-	-	-	1	1	1	1	2	2	1	
C402.5	2	2	1	1	-	-	-	-	-	-	1	1	2	2	1	
C402.6	2	2	1	1	-	1	-	-	1	1	1	1	2	2	1	
C402	2	2	1	1	-	1	-	-	1	1	1	1	2	2	1	

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8703-STRUCTURAL DESIGN AND DRAWING

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8703	Structural Design and Drawing	C403.1: Design and draw reinforced concrete Cantilever and Counterfort Retaining Walls
		C403.2: Design and draw flat slab as per code provisions
		C403.3: Design and draw reinforced concrete and steel bridges
		C403.4: Design and draw reinforced concrete and steel water tanks
		C403.5: Design and detail the various steel trusses and gantry girders
		C403.6: Design of eccentric shear and moment resisting connections

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8703															
C403.1	3	3	3	3	-	-	-	-	-	3	1	1	2	2	1
C403.2	3	3	3	3	-	-	-	-	-	3	1	1	2	2	1
C403.3	3	3	3	3	-	-	-	-	-	3	1	1	2	2	1
C403.4	3	3	3	3	-	-	-	-	-	3	1	1	2	2	1
C403.5	3	3	3	3	-	-	-	-	-	3	1	1	2	2	1
C403.6	3	3	3	3	-	-	-	-	-	3	1	1	2	2	1
C403	3	3	3	3	-	-	-	-	-	3	1	1	2	2	1

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### EN8591-MUNICIPAL SOLID WASTE MANAGEMENT

Course Code	Course Name	Course Outcome (CO) Students will be able to
EN8591	Municipal Solid Waste Management	C404.1: Explain about the nature and characteristics of municipal solid wastes and the regulatory requirements regarding municipal solid waste management.
		C404.2: Explain the process of Reduction, reuse and recycling of waste.
		C404.3: Describe about the plan and design systems for storage, collection, transport, processing and disposal of municipal solid waste.
		C404.4: Illustrate the issues on solid waste management from an integrated and holistic perspective, as well as in the local and international context.
		C404.5: Explain the Design and operation of sanitary landfill.
		C404.6: Describe about the dumpsite rehabilitation

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
EN8591															
C404.1	2	2	1	1	-	1	1	1	3	1	-	1	2	2	1
C404.2	2	2	1	1	-	1	1	-	3	1	-	1	2	2	1
C404.3	2	2	1	1	-	-	1	-	3	1	-	1	2	2	1
C404.4	2	2	1	1	-	-	1	1	3	1	-	1	2	2	1
C404.5	2	2	1	1	-	-	1	1	3	1	-	1	2	2	1
C404.6	2	2	1	1	-	-	1	1	3	1	-	1	2	2	1
C404	2	2	1	1	-	1	1	1	3	1	-	1	2	2	1

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### OTT752-TEXTILE EFFLUENT TREATMENTS

Course Code	Course Name	Course Outcome (CO) Students will be able to
OTT752	Textile Effluent Treatments	C405.1: Explain the textile processing related causes for pollution
		C405.2: Explain the effluent discharge standards and different processes involved in waste water treatment
		C405.3: Perform the research and development to produce zero discharge effluents
		C405.4: Describe about the various process in tertiary treatment
		C405.5: Illustrate the properties of air pollutants and its control measures
		C405.6: Explain the noise pollution, noise measurement and control of noise pollution.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
OTT752															
C405.1	2	1	1	1	-	1	2	-	2	1	-	1	1	1	2
C405.2	2	1	1	1	-	1	2	1	2	1	-	1	1	1	2
C405.3	2	1	1	1	-	1	2	1	2	1	-	1	1	1	2
C405.4	2	1	1	1	-	1	2	-	2	1	-	1	1	1	2
C405.5	2	1	1	1	-	2	2	1	2	1	-	1	1	1	2
C405.6	2	1	1	1	-	1	2	-	2	1	-	1	1	1	2
C405	2	1	1	1	-	1	2	1	2	1	-	1	1	1	2

\*3-High Correlation; 2-Medium Correlation; 1-Low Correlation

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8711-CREATIVE AND INNOVATIVE PROJECT

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8711	Creative and Innovative Project	C406.1: Design building elements
		C406.2: Explain the concepts of building design philosophies
		C406.3: Explain the concept of codal provisions
		C406.4: Describe about the guidelines used for design procedure
		C406.5: Improve their creativity and presentation skills
		C406.6: Illustrate about the various planning and designing softwares

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8711															
C406.1	3	3	3	2	1	2	2	1	3	3	2	2	2	2	1
C406.2	3	3	3	2	1	2	2	1	3	3	2	2	2	2	1
C406.3	3	3	3	2	-	-	2	1	3	3	2	2	2	2	1
C406.4	3	3	3	2	-	-	2	1	3	3	2	2	2	2	1
C406.5	3	3	3	2	-	-	2	1	3	3	2	2	2	2	1
C406.6	3	3	3	2	1	2	2	-	3	3	2	2	2	2	1
C406	3	3	3	2	1	2	2	1	3	3	2	2	2	2	1

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8712-INDUSTRIAL TRAINING

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8712	Industrial Training	C407.1: Describe about the various construction management techniques.
		C407.2: Explain the concepts of developments and implementation of new techniques
		C407.3: Develop skills in facing and solving the field problems.
		C407.4: Compare their theoretical knowledge with practical experience
		C407.5: Explain about the construction site and office based work practically
		C407.6: Illustrate planning and designing software used for construction work.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
CE8712																
C407.1	3	2	2	2	-	-	-	1	1	2	1	1	2	2	1	
C407.2	3	2	2	2	-	-	-	1	1	2	1	1	2	2	1	
C407.3	3	2	2	2	-	-	-	1	1	2	1	1	2	2	1	
C407.4	3	2	2	2	-	-	-	1	1	2	1	1	2	2	1	
C407.5	3	2	2	2	-	-	-	1	1	2	1	1	2	2	1	
C407.6	3	2	2	2	-	-	-	1	1	2	1	1	2	2	1	
C407	3	2	2	2	-	-	-	1	1	2	1	1	2	2	1	

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**DEPARTMENT OF CIVIL ENGINEERING**

**CO-PO MAPPING – 2017 REGULATION**

# **VIII SEMESTER**

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### REGULATION 2017- CO-PO MAPPING

#### GE8076-PROFESSIONAL ETHICS IN ENGINEERING

Course Code	Course Name	Course Outcome (CO) Students will be able to
GE8076	Professional Ethics In Engineering	C408.1: Describe basic purpose of profession, professional ethics and various moral and social issues.
		C408.2: Explain about the various professional rights and responsibilities of a Engineer, safety and risk benefit analysis of a Engineer.
		C408.3: Illustrate about various roles of engineer in applying ethical principles at various professional levels.
		C408.4: Describe professional ethical values and contemporary issues.
		C408.5: Explain about the competitive and challenging environment to contribute to industrial growth.
		C408.6: Compare academic learning with experimental learning in a profession.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
GE8076															
C408.1	2	1	-	-	-	-	-	2	-	1	1	1	-	-	1
C408.2	2	1	-	-	-	-	-	2	-	1	1	1	-	-	1
C408.3	2	1	1	1	-	-	-	2	-	1	1	1	-	-	1
C408.4	2	1	-	-	-	-	-	2	-	1	1	1	-	-	1
C408.5	2	1	-	-	-	-	-	2	-	1	1	1	-	-	1
C408.6	2	1	1	1	-	-	-	2	-	1	1	1	-	-	1
C408	2	1	1	1	-	-	-	2	-	1	1	1	-	-	1

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### REGULATION 2017- CO-PO MAPPING

#### CE8021-STRUCTURAL DYNAMICS AND EARTHQUAKE ENGINEERING

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8021	Structural Dynamics and Earthquake Engineering	C409.1: Explain about the various simulation and mathematical model development.
		C409.2: Identify, formulate and solve complicated problem using modal superposition method.
		C409.3: Explain the role of natural calamity in the damage of structures.
		C409.4: Develop the skill to analyse data and to apply the same in the practical problems.
		C409.5: Apply the developed methodologies for the safe and stable design of structures.
		C409.6: Design earthquake resistant structures using IS codes.

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
CE8021																
C409.1	3	2	2	1	-	1	-	1	3	1	1	1	3	2	2	
C409.2	3	2	2	1	-	1	-	1	3	1	1	1	3	2	2	
C409.3	3	2	2	1	-	1	-	1	3	1	1	1	3	2	2	
C409.4	3	2	2	1	-	1	-	1	3	1	1	1	3	2	2	
C409.5	3	2	2	1	-	1	-	1	3	1	1	1	3	2	2	
C409.6	3	2	2	1	-	1	-	1	3	1	1	1	3	2	2	
C409	3	2	2	1	-	1	-	1	3	1	1	1	3	2	2	

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## DEPARTMENT OF CIVIL ENGINEERING

### REGULATION 2017- CO-PO MAPPING

#### CE8811-PROJECT WORK

Course Code	Course Name	Course Outcome (CO) Students will be able to
CE8811	Project Work	C410.1: Describe about how to take up any challenging practical problems.
		C410.2: Illustrate about finding solution by formulating proper methodology.
		C410.3: Explain the importance of codal provisions
		C410.4: Explain about the problem solving techniques in civil engineering
		C410.5: Improve their technical and presentation skills
		C410.6: Describe about solution finding methods for practical problems

#### CO-PO MAPPING

COs	PROGRAM OUTCOMES												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CE8811															
C410.1	3	3	2	1	1	1	2	1	2	1	1	2	3	2	1
C410.2	3	3	2	1	1	1	-	1	2	1	1	2	3	2	1
C410.3	3	3	2	1	1	1	-	1	2	1	1	2	3	2	1
C410.4	3	3	2	1	1	1	-	1	2	1	1	2	3	2	1
C410.5	3	3	2	1	1	1	2	1	2	1	1	2	3	2	1
C410.6	3	3	2	1	1	1	2	1	2	1	1	2	3	2	1
C410	3	3	2	1	1	1	2	1	2	1	1	2	3	2	1

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