



# **J.K.K.MUNIRAJAH COLLEGE OF TECHNOLOGY**

Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.

Accredited by NAAC with "A" grade

T.N. Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506.



## **BATCH**

## **2019-2023**

**PRINCIPAL**  
**JKK MUNIRAJAH COLLEGE**  
**OF TECHNOLOGY**  
**T.N. PALAYAM (Po)-638 506.**  
**GOBI (Tk), ERODE (Dt).**



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## 1. PROGRAM OUTCOMES (PO) FOR CIVIL ENGINEERING

PO1	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	<b>Design/development of solutions:</b> 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	<b>Conduct investigations of complex problems:</b> 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	<b>Modern tool usage:</b> 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	<b>The engineer and society:</b> 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	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.



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PO9	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	<b>Communication:</b> 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	<b>Project management and finance:</b> 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	<b>Life Long Learning:</b> 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.

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### 2. PROGRAM SPECIFIC OUTCOMES (PSO) FOR CIVIL ENGINEERING

PSO1	Graduates will be able to apply technical skills and modern engineering tools for civil engineering day to day practice.
PSO2	Graduates will be able to participate in critical thinking and problem solving of civil engineering field that requires analytical and design requirements to face the challenging and emerging needs of our society.

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## LIST OF COURSES FOR THE REGULATION 2021 (2019-2023 BATCH)

S.NO	COURSE CODE	SUBJECT CODE	TITLE OF THE SUBJECT
<b>I SEMESTER</b>			
1	C101	HS3151	Professional English - I
2	C102	MA3151	Matrices and Calculus
3	C103	PH3151	Engineering Physics
4	C104	CY3151	Engineering Chemistry
5	C105	GE3151	Problem Solving and Python Programming
6	C106	GE3171	Problem Solving and Python Programming Laboratory
7	C107	BS3171	Physics and Chemistry Laboratory
<b>II SEMESTER</b>			
8	C108	HS3251	Professional English - II
9	C109	MA3251	Statistics and Numerical Methods
10	C110	PH3201	Physics for Civil Engineering
11	C111	BE3252	Basic Electrical, Electronics and Instrumentation Engineering
12	C112	GE3251	Engineering Graphics
13	C113	GE3271	Engineering Practices Laboratory
14	C114	BE3272	Basic Electrical, Electronics and Instrumentation Engineering Laboratory



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III SEMESTER			
15	C201	MA8353	Transforms And Partial Differential Equations
16	C202	CE8301	Strength of Materials - I
17	C203	CE8302	Fluid Mechanics
18	C204	CE8351	Surveying
19	C205	CE8391	Construction Materials
20	C206	CE8392	Engineering Geology
21	C207	CE8311	Construction Materials Laboratory
22	C208	CE8361	Surveying Laboratory
23	C209	HS8381	Interpersonal Skills / Listening And Speaking
IV SEMESTER			
24	C210	MA8491	Numerical Methods
25	C211	CE8401	Construction Techniques And Practices
26	C212	CE8402	Strength of Materials - II
27	C213	CE8403	Applied Hydraulic Engineering
28	C214	CE8404	Concrete Technology
29	C215	CE8491	Soil Mechanics
30	C216	CE8481	Strength of Materials Laboratory
31	C217	CE8461	Hydraulic Engineering Laboratory
32	C218	HS8461	Advanced Reading And Writing
LIST OF COURSES FOR THE REGULATION 2017 (2019-2023 BATCH)			



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V SEMESTER			
33	C301	CE8501	Design of Reinforced Cement Concrete Elements
34	C302	CE8502	Structural Analysis - I
35	C303	EN8491	Water Supply Engineering
36	C304	CE8591	Foundation Engineering
37	C305	GI8014	Geographic Information System
38	C306	OAI551	Environment And Agriculture
39	C307	CE8511	Soil Mechanics Laboratory
40	C308	CE8512	Water And Waste Water Analysis Laboratory
41	C309	CE8513	Survey Camp
VI SEMESTER			
42	C310	CE8601	Design of Steel Structural Elements
43	C311	CE8602	Structural Analysis - II
44	C312	CE8603	Irrigation Engineering
45	C313	CE8604	Highway Engineering
46	C314	EN8592	Wastewater Engineering
47	C315	CE8005	Air Pollution And Control Engineering
48	C316	CE8611	Highway Engineering Laboratory
49	C317	CE8612	Irrigation & Environmental Engineering Drawing
50	C318	HS8581	Professional Communication
VII SEMESTER			
51	C401	CE8701	Estimation, Costing and Valuation Engineering
52	C402	CE8702	Railways, Airports, Docks and Harbour Engineering



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53	C403	CE8703	Structural Design and Drawing
54	C404	CE8012	Construction, Planning and Scheduling
55	C405	OME754	Industrial Safety
56	C406	CE8711	Creative and Innovative Project
57	C407	CE8712	Industrial Training
<b>VIII SEMESTER</b>			
58	C408	CE8020	Maintenance, Repair & Rehabilitation of Structures
59	C409	GE8076	Professional Ethics in Engineering
60	C410	CE8811	Project Work

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## LIST OF COURSE OUTCOMES (REGULATION 2021 & 2017) FOR CIVIL ENGINEERING

### SEMESTER I

Course Code & Name : C101 & HS3151- Professional English - I		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C101.1</b>	<b>Applying</b> strategies of skimming, communication, writing, speaking, listening , read articles of different types of texts and comprehend messages.	<b>K3</b>
<b>C101.2</b>	<b>Understanding</b> and comprehend different types of conversations, talks, to learn to use basic grammatical structures in suitable contexts.	<b>K2</b>
<b>C101.3</b>	<b>Analyzing</b> and Speak eloquently by contextualizing newly learnt vocabulary on personal information and use them appropriately in a sentence and understand their meaning in a text.	<b>K4</b>
<b>C101.4</b>	<b>Applying</b> one's ideas and thoughts in grammatically correct and culturally appropriate language in a variety of academic and professional writings.	<b>K3</b>
<b>C101.5</b>	<b>Communication skills</b> appropriate to the study of engineering and to use the relevant materials that focus on issues related to engineering professional practice.	<b>K2</b>

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>C101.1</b>		-	-	-	2	-	-	2	3	3	3	3	2	-
<b>C101.2</b>	-	-	-	-	2	-	-	2	3	3	3	3	2	-
<b>C101.3</b>	-	-	-	-	2	-	-	2	3	3	3	3	-	-
<b>C101.4</b>	-	-	-	-	2	-	-	2	3	3	3	3	2	-
<b>C101.5</b>	-	-	-	-	2	-	-	2	3	3	-	3	2	-
<b>C101</b>	-	-	-	-	2	-	-	2	3	3	3	3	2	-

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Course Code & Name : CI02& MA3151- Matrices and Calculus		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C102.1</b>	<b>Apply</b> the Mathematical Knowledge of rules of matrix algebra techniques to differentiate one variable function	<b>K3</b>
<b>C102.2</b>	<b>Understand</b> the knowledge of differential calculus to solve the value of the function of several variables	<b>K2</b>
<b>C102.3</b>	Familiarize the student with functions of several variables. This is needed in many branches of engineering	<b>K5</b>
<b>C102.4</b>	<b>Identify</b> and evaluate various techniques of integration	<b>K5</b>
<b>C102.5</b>	<b>Identify</b> a basic knowledge and with mathematical tools needed in evaluating multiple integrals and their applications.	<b>K3</b>

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
<b>C102.1</b>	3	3	1	-	2	-	-	2	1	-	-	3	1	1
<b>C102.2</b>	3	3	1	-	2	-	-	2	1	-	-	3	1	1
<b>C102.3</b>	3	3	1	-	2	-	-	2	1	-	-	3	1	1
<b>C102.4</b>	3	3	1	-	2	-	-	2	1	-	-	3	1	1
<b>C102.5</b>	3	3	1	-	2	-	-	2	1	-	-	3	1	1
<b>C102</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>-</b>	<b>2</b>	<b>-</b>	<b>-</b>	<b>2</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>3</b>	<b>1</b>	<b>1</b>

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Course Code & Name : C103& PH3151- Engineering Physics		
	CO Statements	Knowledge level
The students should be able to		
C103.1	Develop knowledge on the basics of creativity of mechanics	K6
C103.2	Apply the concepts of to gain knowledge of electromagnetic waves and its applications	K3
C103.3	Acquire knowledge on the basics of oscillations, optics and lasers	K2
C103.4	Understand the concept of the importance of quantum physics	K2
C103.5	Apply the concept of quantum mechanics	K3

	PO 1	PO2	PO 3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2
C103.1	3	3	2	3	3	1	2	2	1	2	-	3	-	-
C103.2	3	3	2	3	3	-	-	2	1	2	-	3	1	1
C103.3	3	3	2	3	3	2	2	2	1	3	-	3	-	-
C103.4	3	3	1	3	3	1	-	2	1	2	-	3	-	-
C103.5	3	3	2	3	3	1	-	2	1	3	-	3	1	1
C103	3	3	2	3	3	1	2	2	1	2	-	3	1	1



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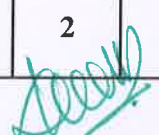
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Course Code & Name : C104& CY3151- Engineering Chemistry		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C104.1	To obtain and understanding of water quality parameters and water treatment techniques	K2
C104.2	To get the basic principles and preparatory methods of nano materials	K1
C104.3	To get a basic understanding of phase rules & composites	K2
C104.4	To Learn the concepts of fuels and combustion	K2
C104.5	To Learn the latest trends of energy sources and storage devices	K3

	PO 1	PO 2	PO 3	PO 4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C10 4.1	3	2	2	1	2	3	3	2	-	1	-	2	-	-
C10 4.2	3	3	1	1	2	1	3	2	-	-	-	2	1	1
C10 4.3	3	2	2	1	1	1	3	2	-	1	-	2	-	-
C10 4.4	3	2	1	1	1	1	3	2	-	1	-	2	-	-
C10 4.5	3	1	3	2	1	2	3	2	-	-	-	2	1	1
C10 4	3	2	2	1	1	1	3	2	-	1	-	2	1	1

  
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Course Code & Name : C105& GE3151- Problem Solving And Python Programming		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C105.1</b>	<b>Develop</b> algorithmic solutions to simple computational problems	<b>K6</b>
<b>C105.2</b>	To learn to solve problems using Python conditionals and loops.	<b>K4</b>
<b>C105.3</b>	<b>Structure</b> simple Python programs for solving problems.	<b>K2</b>
<b>C105.4</b>	<b>Represent</b> compound data using Python lists, tuples, and dictionaries. Read and write data from/to files in Python Programs	<b>K5</b>
<b>C105.5</b>	<b>Analyze</b> to do input/output with files in Python	<b>K4</b>

	P O1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>C105.1</b>	3	3	3	3	2	-	-	-	-	-	2	2	3	3
<b>C105.2</b>	3	3	3	3	2	-	-	-	-	-	2	2	3	3
<b>C105.3</b>	3	3	3	3	2	-	-	-	-	-	2	-	3	3
<b>C105.4</b>	2	2	-	2	2	-	-	-	-	-	1	-	3	3
<b>C105.5</b>	1	2	-	-	1	-	-	-	-	-	1	-	3	3
<b>C105</b>	2	3	3	3	2	-	-	-	-	-	2	2	3	3

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Course Code & Name : C106 & GE3171- Problem Solving And Python Programming Laboratory		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C106.1</b>	<b>Write, test, and debug simple Python programs.</b>	<b>K6</b>
<b>C106.2</b>	<b>Implement Python programs with conditionals and loops.</b>	<b>K4</b>
<b>C106.3</b>	<b>Develop Python programs step-wise by defining functions and calling them.</b>	<b>K2</b>
<b>C106.4</b>	<b>Use Python lists, tuples, dictionaries for representing compound data.</b>	<b>K5</b>
<b>C106.5</b>	<b>Read and write data from/to files in Python</b>	<b>K4</b>

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>C106.1</b>	3	3	3	3	3	-	-	-	-	-	3	2	3	3
<b>C106.2</b>	3	3	3	3	3	-	-	-	-	-	3	2	3	3
<b>C106.3</b>	3	3	3	3	2	-	-	-	-	-	2	-	3	3
<b>C106.4</b>	3	2	-	2	2	-	-	-	-	-	1	-	3	3
<b>C106.5</b>	1	2	-	-	1	-	-	-	-	-	1	-	3	3
<b>C106</b>	3	3	3	3	2	-	-	-	-	-	2	2	3	3

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Course Code & Name : C107 & BS3171- Physics And Chemistry Laboratory		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C107.1	The hands on exercises undergone by the students will help them to apply physics principles of optics and thermal physics to evaluate engineering properties of materials.	K6
C107.2	The hands on exercises undergone by the students will help them to apply physics principles of thermal physics to evaluate engineering properties of materials.	K3
C107.3	The hands on exercises undergone by the students will help them to apply engineering properties of materials.	K2
C107.4	The students will be conversant with hands-on knowledge in the quantitative chemical analysis of water quality related parameters, corrosion measurement	K2
C107.5	The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters.	K3

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



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## SEMESTER II

Course Code & Name : C108 & HS3251- Professional English - II

	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C108.1</b>	<b>Read</b> to engage learners in meaningful language activities to improve their reading and writing skills	<b>K3</b>
<b>C108.2</b>	<b>Listen</b> to learn various reading strategies and apply in comprehending documents in professional context	<b>K2</b>
<b>C108.3</b>	<b>Speak</b> to help learners understand the purpose, audience, contexts of different types of writing	<b>K4</b>
<b>C108.4</b>	<b>Write</b> to develop analytical thinking skills for problem solving in communicative contexts	<b>K3</b>
<b>C108.5</b>	<b>Able</b> To demonstrate an understanding of job applications and interviews for internship and placements	<b>K2</b>

	PO 1	PO 2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
C108.1	-	-	-	-	2	-	-	2	3	3	3	3	2	-
C108.2	-	-	-	-	2	-	-	2	3	3	3	3	2	-
C108.3	-	-	-	-	2	-	-	2	3	3	3	3	-	-
C108.4	-	-	-	-	2	-	-	2	3	3	3	3	2	-
C108.5	-	-	-	-	2	-	-	2	3	3	3	3	2	-
C108	-	-	-	-	2	-	-	2	3	3	3	3	2	-

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Course Code & Name : C109 & MA3251 - Statistics and Numerical Methods		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C109.1	<b>Evaluate</b> the basic concepts of a few statistical and numerical methods and give procedures for solving numerically different kinds of problems occurring in engineering and technology	K3
C109.2	<b>Understand</b> to acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life problems.	K2
C109.3	<b>Understand</b> the basic concepts of solving algebraic and transcendental equations	K5
C109.4	<b>Understand</b> the numerical techniques of interpolation in various intervals and numerical techniques of differentiation and integration which plays an important role in engineering and technology disciplines.	K5
C109.5	<b>Evaluate</b> To acquaint the knowledge of various techniques and methods of solving ordinary differential equations	K3

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C109.1	3	3	1	-	2	-	-	2	1	-	-	3	1	1
C109.2	3	3	1	-	2	-	-	2	1	-	-	3	1	1
C109.3	3	3	1	-	2	-	-	2	1	-	-	3	1	1
C109.4	3	3	1	-	2	-	-	2	1	-	-	3	1	1
C109.5	3	3	1	-	2	-	-	2	1	-	-	3	1	1
C109	3	3	1	-	2	-	-	2	1	-	-	3	1	1

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Course Code & Name : C110 & PH3201 - Physics for Civil Engineering		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C110.1	Gain knowledge to introduce the basics of heat transfer through different materials, thermal performance of building and various thermal applications	K6
C110.2	Gain knowledge to impart knowledge on the ventilation and air conditioning of buildings	K3
C110.3	Gain knowledge to introduce the concepts of sound insulation and lighting designs	K2
C110.4	Gain knowledge to give an introduction to the processing and applications of new engineering materials	K2
C110.5	Gain knowledge to create an awareness on natural disasters and safety measures	K3

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO1 2	PS O 1	P S O 2
C110.1	3	3	2	3	3	1	2	2	1	2	-	3	-	-
C110.2	3	3	2	3	3	-	-	2	1	2	-	3	1	1
C110.3	3	3	2	3	3	2	2	2	1	3	-	3	-	-
C110.4	3	3	1	3	3	1	-	2	1	2	-	3	-	-
C110.5	3	3	2	3	3	1	-	2	1	3	-	3	1	1
C110	3	3	2	3	3	1	2	2	1	2	-	3	1	1



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**Course Code & Name : C111 & BE3252- Basic Electrical, Electronics and Instrumentation Engineering**

	CO Statements	Knowledge level
<b>The students should be able to</b>		
C111.1	To learn the basics of electric circuits and analysis	K2
C111.2	Ability to impart knowledge in the basics of working principles and application of electrical machines	K3
C111.3	Ability to introduce analog devices and their characteristics	K4
C111.4	To learn educate on the fundamental concepts of digital electronics	K2
C111.5	To learn the functional elements and working of measuring instruments	K4

	PO 1	PO 2	PO3	PO4	PO5	PO6	PO 7	PO8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C111.1	3	3	3	-	-	1	1	2	-	2	3	3	2	2
C111.2	3	3	3	-	-	1	1	2	-	2	3	3	2	2
C111.3	3	3	2	-	-	1	1	2	-	2	3	3	2	2
C111.4	3	3	2	-	-	1	1	2	-	2	3	3	2	2
C111.5	3	3	2	-	-	1	1	2	-	2	3	3	2	2
C111	3	3	2	-	-	1	1	2	-	2	3	3	2	2

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Course Code & Name : C112 & GE 3251 - Engineering Graphics

	CO Statements	Knowledge level
The students should be able to		
C112.1	Familiarize with the fundamentals and standards of Engineering graphics	K6
C112.2	Perform freehand sketching of basic geometrical constructions and multiple views of objects.	K3
C112.3	Project orthographic projections of lines and plane surfaces.	K4
C112.4	Draw projections and solids and development of surfaces.	K4
C112.5	Visualize and to project isometric and perspective sections of simple solids	K3

	P O 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS O1	PS O2
C112.1	3	3	2	1	3	2	-	2	-	2	-	3	2	2
C112.2	3	3	2	1	3	2	-	2	-	2	-	3	2	2
C112.3	3	3	2	1	3	2	-	2	-	2	-	3	2	2
C112.4	3	3	2	1	3	2	-	2	-	2	-	3	2	2
C112.5	3	3	2	1	3	2	-	2	-	2	-	3	2	2
C112	3	3	2	1	3	2	-	2	-	2	-	3	2	2



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Course Code & Name : C113 & GE3271- Engineering Practices Laboratory		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C113.1	<b>Fabricate</b> carpentry components and pipe connections including plumbing works. Use welding equipments to join the structures.	K3
C113.2	<b>Carry out</b> the basic machining operations	K4
C113.3	<b>Make</b> the models using sheet metal works, Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings	K3
C113.4	<b>Carry out</b> basic home electrical works and appliances and Measure the electrical quantities	K2
C113.5	<b>Elaborate</b> on the components, gates, soldering practices	K6

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C113.1	3	3	3	1	3	3	-	3	-	2	2	3	2	2
C113.2	3	3	3	1	3	3	-	3	-	2	2	3	2	2
C113.3	3	3	3	1	3	3	-	3	-	2	2	3	2	2
C113.4	3	3	3	1	3	3	-	3	-	2	2	3	2	2
C113.5	3	3	3	1	3	3	-	3	-	2	2	3	2	2
C113	3	3	3	1	3	3	-	3	-	2	2	3	2	2

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Course Code & Name : C114& BE3272- Basic Electrical, Electronics and Instrumentation Engineering Laboratory		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C114.1	To learn the basics of electric circuits and analysis	K2
C114.2	Ability to impart knowledge in the basics of working principles and application of electrical machines	K3
C114.3	Ability to introduce analog devices and their characteristics	K4
C114.4	To learn educate on the fundamental concepts of digital electronics	K2
C114.5	To learn the functional elements and working of measuring instruments	K4

	PO 1	P O2	PO3	PO4	PO5	PO6	P O 7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C114.1	3	3	3	-	-	1	1	2	-	2	3	3	2	2
C114.2	3	3	3	-	-	1	1	2	-	2	3	3	2	2
C114.3	3	3	2	-	-	1	1	2	-	2	3	3	2	2
C114.4	3	3	2	-	-	1	1	2	-	2	3	3	2	2
C114.5	3	3	2	-	-	1	1	2	-	2	3	3	2	2
C114	3	3	2	-	-	1	1	2	-	2	3	3	2	2



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## SEMESTER III

Course Code & Name : C201 & MA3351- Transforms And Partial Differential Equations

	CO Statements	Knowledge level
<b>The students should be able to</b>		
C201.1	Identify the partial differential equations of both homogeneous and non-homogeneous type and understand how to solve standard partial differential equations.	K4
C201.2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.	K2
C201.3	Solve one- and two-dimensional heat flow problems and one-dimensional wave equations using Fourier series techniques.	K2
C201.4	Analyze the mathematical principles on transforms and partial differential equations would provide them the ability to solve some of the physical problems of engineering.	K4
C201.5	Apply the mathematical tools for the solutions of partial differential equations by using z-transform techniques.	K3

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C201.1	2	3	-	-	2	-	-	-	-	-	-	-	2	-
C201.2	3	3	2	2	3	2	-	-	-	-	-	2	2	-
C201.3	2	2	-	-	2	-	-	-	-	-	-	-	2	-
C201.4	3	3	2	1	3	1	-	-	-	-	-	-	2	2
C201.5	3	2	3	2	3	2	-	-	-	-	-	2	2	-
C201	2.6	2.6	2.3	1.6	2.6	1.6	-	-	-	-	-	2	2	2

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Course Code & Name : C202 & ME3351 ENGINEERING MECHANICS		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C202.1	To Learn the use scalar and vector analytical techniques for analyzing forces in Statically determinate structures	K2
C202.2	To introduce the equilibrium of rigid bodies	K2
C202.3	To study and understand the distributed forces, surface, loading on beam and intensity	K2
C202.4	To learn the principles of friction, forces and to determine the apply the concepts of frictional forces at the contact surfaces of various engineering systems.	K3
C202.5	To develop basic dynamics concepts – force, momentum, work and energy	K4

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C202.1	3	3	2	2	2	-	-	-	-	-	-	2	2	2
C202.2	3	3	2	2	2	-	-	-	-	-	-	2	2	2
C202.3	3	3	2	2	2	-	-	-	-	-	-	2	2	2
C202.4	3	3	2	2	2	-	-	-	-	-	-	2	2	2
C202.5	3	3	2	2	2	-	-	-	-	-	-	2	2	2
C202	3	3	2	2	2	-	-	-	-	-	-	2	2	2

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Course Code & Name : C203 & CE3301- Fluid Mechanics		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C203.1	Get a basic knowledge of fluids in static, kinematic and dynamic equilibrium.	K5
C203.2	Understand and solve the problems related to equation of motion.	K2
C203.3	Gain knowledge about dimensional and model analysis.	K5
C203.4	Learn types of flow and losses of flow in pipes.	K3
C203.5	Understand and solve the boundary layer problems	K2

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C203.1	3	2	1	2	-	-	-	-	-	-	-	-	3	3
C203.2	3	3	2	1	-	-	-	-	-	-	-	-	3	-
C203.3	3	3	3	2	1	2	-	-	-	-	2	-	2	2
C203.4	3	3	2	3	-	-	2	2	-	-	-	-	3	3
C203.5	3	2	3	2	-	-	-	-	-	-	-	-	3	-
C203	3	2.6	2.2	2	1	2	2	2	-	-	2	-	2.8	2.66

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Course Code & Name : C204 & CE3302- CONSTRUCTION MATERIALS AND TECHNOLOGY		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C204.1	Compare the properties of most common and advanced building materials.	K5
C204.2	Classify the typical and potential applications of lime, cement and aggregates	K3
C204.3	Know the production of concrete and also the method of placing and making of concrete elements.	K6
C204.4	To summarize the applications of timbers and other materials	K4
C204.5	To outline the importance of modern material for construction.	K5

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C204.1	-	2	-	-	-	2	-	2	-	-	-	2	3	2
C204.2	2	2	-	-	-	-	-	2	-	-	-	2	3	2
C204.3	3	2	-	-	-	-	-	2	-	-	-	2	3	2
C204.4	-	2	-	-	3	-	-	-	-	-	-	2	3	2
C204.5	-	2	-	-	3	2	-	2	-	-	-	2	3	2
C204.1	2.5	2	-	-	3	2	-	2	-	-	-	2	3	2

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Course Code & Name : C205 & CE3303-WATER SUPPLY AND WASTE WATER ENGINEERING		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C205.1	To introduce students to various components and design of water supply scheme	K5
C205.2	To learn water treatment methods.	K4
C205.3	To Know water storage distribution system,	K6
C205.4	To summarize the applications sewage treatment and disposal	K5
C205.5	To design of intake structures and sewerage system.	K5

	P O 1	P O 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C205.1	-	3	3	2	3	-	-	2	-	-	-	3	3	2
C205.2	-	3	3	2	3	-	-	2	-	-	-	3	3	2
C205.3	-	3	3	2	3	-	-	2	-	-	-	3	3	2
C205.4	-	3	3	2	3	-	-	2	-	-	-	3	3	2
C205.5	-	3	3	2	3	-	-	2	-	-	-	3	3	2
C205	-	3	3	2	3	-	-	2	-	-	-	3	3	2

  
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Course Code & Name : C206 & CE3351 SURVEYING AND LEVELLING		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C206.1	To introduce the rudiments of plane surveying and geodetic principles to Civil Engineers	K5
C206.2	To learn the various methods of plane and geodetic surveying	K4
C206.3	To solve the real world problems.	K5
C206.4	To introduce the concepts of Control Surveying.	K6
C206.5	To introduce the basics of Astronomical Surveying	K6

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C206.1	-	2	2	-	2	-	-	2	-	-	-	2	-	-
C206.2	-	2	2	-	2	-	-	2	-	-	-	2	-	-
C206.3	-	2	2	-	2	-	-	2	-	-	-	2	-	-
C206.4	-	2	2	-	2	-	-	2	-	-	-	2	-	-
C206.5	-	2	2	-	2	-	-	2	-	-	-	2	2	-
C206	-	2	2	-	2	-	-	2	-	-	-	2	2	-

  
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Course Code & Name : C207 & CE8311- Construction Materials Laboratory		
	CO Statements	Knowledge level
The students should be able to		
C207.1	To experiment with fine aggregates to analyse its properties.	K6
C207.2	To analyse the physical properties of the coarse aggregates.	K4
C207.3	To analyse the different properties of concrete.	K4
C207.4	To examine the different physical properties of bricks and blocks	K4
C207.5	To summarize the properties of different materials used in the construction field	K4

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C207.1	2	-	-	-	2	-	-	-	-	-	-	-	-	-
C207.2	2	-	-	-	2	-	-	2	-	-	-	-	-	-
C207.3	2	-	-	-	2	-	2	2	-	-	-	2	2	-
C207.4	2	-	2	2	2	-	2	2	-	-	-	2	2	-
C207.5	2	-	2	-	-	2	-	-	-	-	-	2	-	-
C207	2	-	2	2	2	2	2	2	-	-	-	2	2	-

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Course Code & Name : C208 & CE3311- WATER AND WASTE WATER ANALYSIS LABORATORY		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C208.1</b>	<b>To Calibrate</b> and standardize the equipment	<b>K5</b>
<b>C208.2</b>	<b>To Collect</b> proper sample for analysis	<b>K6</b>
<b>C208.3</b>	<b>To know</b> the sample preservation methods	<b>K6</b>
<b>C208.4</b>	<b>To perform</b> field oriented testing of water, wastewater	<b>K6</b>
<b>C208.5</b>	<b>To perform</b> coliform analysis	<b>K4</b>

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
<b>C208.1</b>	2	2	2	2	3	2	-	-	2	1	-	2	-	-
<b>C208.2</b>	2	2	2	2	3	2	-	-	2	1	-	2	-	-
<b>C208.3</b>	2	2	2	2	3	2	-	-	2	1	-	2	-	-
<b>C208.4</b>	2	2	2	2	3	2	-	-	2	1	-	2	-	-
<b>C208.5</b>	2	2	2	2	3	2	-	-	2	1	-	3	2	2
<b>C208</b>	2	2	2	2	3	2	-	-	2	1	-	2.2	2	2

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Course Code & Name : C209 & GE3361- PROFESSIONAL DEVELOPMENT		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C209.1	To be proficient in important Microsoft Office tools: MS WORD, EXCEL, POWERPOINT.	K3
C209.2	To be proficient in using MS WORD to create quality technical documents, by using standard templates, widely acceptable styles and formats, variety of features to enhance the presentability and overall utility value of content	K4
C209.3	To be proficient in using MS EXCEL for all data manipulation tasks including the common statistical, logical, mathematical etc., operations, conversion, analytics, search and explore, visualize, interlink, and utilizing many more critical features offered	K6
C209.4	To be able to create and share quality presentations by using the features of MS PowerPoint, including: organization of content, presentability, aesthetics, using media elements and enhance the overall quality of presentations.	K6
C209.5	To Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects.	K5

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C209.1	-	-	-	-	-	-	-	-	2	3	-	2	3	3
C209.2	-	-	-	-	-	-	-	-	2	3	-	2	2	3
C209.3	-	-	-	-	-	-	-	-	2	3	-	2	3	3
C209.4	-	-	-	-	-	-	-	-	2	3	-	2	3	3
C209.5	-	-	-	-	-	-	-	-	2	3	-	2	3	3
C209	-	-	-	-	-	-	-	-	2	3	-	2	3	3

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## SEMESTER IV

Course Code & Name : C210 & CE3401- APPLIED HYDRAULIC ENGINEERING

	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C210.1</b>	To impart basic knowledge to the students about the open channel flows	<b>K2</b>
<b>C210.2</b>	To deal with analysis of uniform flow, gradually varied flow and rapidly varied flow	<b>K2</b>
<b>C210.3</b>	To expose them to basic principles of working of hydraulic machineries	<b>K6</b>
<b>C210.4</b>	To design Pelton wheel, Francis and Kaplan turbine.	<b>K2</b>
<b>C210.5</b>	To design Centrifugal and Reciprocating pumps.	<b>K2</b>

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
<b>C210.1</b>	3	2	-	2	2	3	-	-	-	2	-	1	2	-
<b>C210.2</b>	3	2	-	2	2	3	-	-	-	2	-	1	2	-
<b>C210.3</b>	3	2	-	2	2	3	-	-	-	2	-	1	2	2
<b>C210.4</b>	3	2	-	2	2	3	-	-	-	2	-	1	2	2
<b>C210.5</b>	3	2	-	2	2	3	-	-	-	2	-	1	2	2
<b>C210.1</b>	3	2	-	2	2	3	-	-	-	2	-	1	2	2

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Course Code & Name : C211 & CE3402 – STRENGTH OF MATERIALS		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C211.1	To relate the concepts of stress and strain, principal stresses and principal planes.	K2
C211.2	To solve the shear force and bending moment in beams and understand concept of theory of simple bending	K4
C211.3	To solve the deflection of beams by different methods and selection of method for determining slope or deflection.	K6
C211.4	Apply basic equation of torsion in design of circular shafts and helical springs,	K2
C211.5	To determine the deformation in determinate beams and to know the basic concepts of analysis of indeterminate beams	K5

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO2
C211.1	-	2	-	-	2	2	-	2	-	-	-	2	2	2
C211.2	-	2	-	-	2	2	-	2	-	-	-	2	2	2
C211.3	-	2	-	-	2	2	-	2	-	-	-	2	2	2
C211.4	-	2	-	-	2	2	-	2	-	-	-	2	2	2
C211.5	-	2	-	-	2	2	-	2	-	-	2	2	2	2
C211	-	2	-	-	2	2	-	2	-	-	2	2	2	2



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Course Code & Name : C212 & CE8403 – CONCRETE TECHNOLOGY		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C212.1	To study the properties of concrete making materials.	K5
C212.2	To have better knowledge about the chemical and mineral admixtures in concrete	K4
C212.3	To familiarize with the IS method of mix design as per the latest code	K6
C212.4	To understand the fresh and hardened properties of concrete. To know the importance.	K4
C212.5	To avail the applications of special concretes	K5

	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C212.1	3	3	2	2	2	-	-	-	-	-	-	2	2	2
C212.2	3	3	2	2	2	-	-	-	-	-	-	2	2	2
C212.3	3	3	2	2	2	-	-	-	-	-	-	2	2	2
C212.4	3	3	2	2	2	-	-	-	-	-	-	2	2	2
C212.5	3	3	2	2	2	-	-	-	-	-	-	2	2	2
C212.1	3	3	2	2	2	-	-	-	-	-	-	2	2	2

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Course Code & Name : C213 & CE3404- SOIL MECHANICS		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C213.1	Analyze the classification of soils and assess the engineering properties	K1
C213.2	Understand the stress concepts in soils	K5
C213.3	Understand and identify the settlement's in soil	K2
C213.4	Determine the shear strength of soil	K5
C213.5	Analyze the both finite and infinite slopes	K5

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C213.1	3	2	-	2	-	-	-	2	-	-	-	2	-	-
C213.2	3	2	-	2	-	-	-	2	-	-	-	2	-	-
C213.3	3	2	-	2	-	-	-	2	-	-	-	2	2	-
C213.4	2	3	-	2	-	-	-	2	-	-	-	2	2	-
C213.5	2	3	-	2	-	-	-	2	-	-	-	2	2	-
C213	2.6	2.4	-	2	-	-	-	2	-	-	-	2	-	-



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Course Code & Name : C214 & CE3405 – HIGHWAY AND RAILWAY ENGINEERING		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C214.1</b>	<b>To summarize</b> planning and aligning of highway.	<b>K1</b>
<b>C214.2</b>	<b>To Analyse</b> the Geometric design of highways.	<b>K2</b>
<b>C214.3</b>	<b>Apply</b> the acquired knowledge on the design flexible and rigid pavements.	<b>K2</b>
<b>C214.4</b>	<b>Recall</b> the Highway construction materials, properties, testing methods.	<b>K2</b>
<b>C214.5</b>	To give an overview about the highway and railway engineering with respect to, planning, design, construction and maintenance as per IRC standards, specifications and methods.	<b>K5</b>

	P O 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C214. 1	3	2	-	2	-	-	2	2	-	-	-	3	3	2
C214. 2	3	2	-	2	-	-	2	2	-	-	-	3	3	2
C214. 3	3	2	-	2	-	-	2	2	-	-	-	3	3	2
C214. 4	3	2	-	2	-	-	2	2	-	-	-	3	3	2
C214. 5	3	2	-	2	-	-	2	2	-	-	-	3	3	2
C214	3	2	-	2	-	-	2	2	-	-	-	3	3	2

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Course Code & Name : C215 & GE3451- ENVIRONMENTAL SCIENCES AND SUSTAINABILITY		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C215.1</b>	<b>To introduce</b> the basic concepts of environment, ecosystems and biodiversity and emphasize on the biodiversity of India and its conservation. To impart knowledge on the causes, effects and control or prevention measures of environmental pollution and natural disasters.	<b>K4</b>
<b>C215.2</b>	<b>To facilitate</b> the understanding of global and Indian scenario of renewable and nonrenewable resources, causes of their degradation and measures to preserve them.	<b>K2</b>
<b>C215.3</b>	<b>To familiarize</b> the concept of sustainable development goals and appreciate the interdependence of economic and social aspects of sustainability, recognize and analyze climate changes, concept of carbon credit and the challenges of environmental management.	<b>K2</b>
<b>C215.4</b>	<b>To inculcate</b> and embrace sustainability practices and develop a broader understanding on green materials, energy cycles	<b>K5</b>
<b>C215.5</b>	<b>To analyze</b> the role of sustainable urbanization	<b>K4</b>

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 0	PO 1	PO 2	PSO 1	PSO 2
<b>C215.1</b>	3	3	3	1	2	2	-	2	2	3	-	3	3	3
<b>C215.2</b>	3	3	3	2	2	2	-	3	2	3	-	3	3	3
<b>C215.3</b>	3	3	3	2	2	2	-	2	2	2	-	3	3	3
<b>C215.4</b>	3	3	3	2	2	2	-	2	2	2	-	3	3	3
<b>C215.5</b>	3	3	3	2	2	2	-	3	2	2	-	3	3	3
<b>C215</b>	3	3	3	2	2	2	-	2	2	2	-	3	3	3

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Course Code & Name : C216 & CE3411- Hydraulic Engineering Laboratory		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C216.1	Identify the coefficient of discharge using Orifice meter and Venturimeter.	K5
C216.2	To inspect the flow in pipes due to frictional losses.	K4
C216.3	Examine the performance characteristics of various pumps.	K4
C216.4	Experiment with turbines to find the performance characteristics..	K5
C216.5	Analyze the metacentric height of floating bodies.	K5

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C216.1	3	3	3	3	-	-	-	3	3	3	-	2	3	3
C216.2	3	3	3	3	-	-	-	3	3	3	-	2	3	3
C216.3	3	3	3	3	-	-	-	3	3	3	-	2	3	3
C216.4	3	3	3	-	-	-	-	3	3	3	-	-	3	3
C216.5	3	3	3	3	-	-	-	3	3	3	-	2	3	3
C216	3	3	3	3	-	-	-	3	3	3	-	2	3	3

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Course Code & Name : C217 & 3412 Materials Testing Laboratory		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C217.1	To Determine the mechanical properties of steel.	K5
C217.2	To Determine the physical properties of cement .	K5
C217.3	To Determine the physical properties of fine and coarse aggregate.	K4
C217.4	To Determine the workability and compressive strength of concrete.	K4
C217.5	To Determine the strength of brick and wood.	K4

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C217.1	3	-	-	-	-	-	-	3	3	-	-	2	3	3
C217.2	3	3	-	-	-	-	-	3	3	3	-	-	3	3
C217.3	3	3	-	-	-	-	-	3	3	3	-	-	3	3
C217.4	3	3	-	-	-	2	-	3	3	3	-	2	3	3
C217.5	3	3	-	-	-	2	-	3	3	3	-	2	3	3
C217	3	3	-	-	-	2	-	3	3	3	-	2	3	3

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Course Code & Name : C218 & CE3413- SOIL MECHANICS LABORATORY		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C218.1	To <b>analyse</b> the index properties of soil.	K5
C218.2	To <b>examine</b> the density of soil in the field using sand replacement and core cutter method.	K2
C218.3	To <b>inspect</b> the moisture content in the soil using the proctor compaction test.	K3
C218.4	To <b>examine</b> the permeability of soil using different methods	K3
C218.5	To <b>test</b> the soil to know its various engineering properties.	K2

	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	PO10	PO11	PO12	PSO1	PSO2
C218.1	-	-	-	-	-	-	-	-	2	3	-	3	-	-
C218.2	-	-	-	-	-	-	-	-	2	2	-	2	-	-
C218.3	-	-	-	-	-	-	-	-	2	3	-	3	-	-
C218.4	-	-	-	-	-	-	-	-	2	2	-	3	-	-
C218.5	-	-	-	-	-	-	-	-	3	2	-	3	-	-

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## SEMESTER V

Course Code & Name : C301 & CE8501 - Design of Reinforced Cement Concrete Elements

	CO Statements	Knowledge level
<b>The students should be able to</b>		
C301.1	To summarize the various design methodologies for the design of RC elements.	K5
C301.2	Make use of limit state method to design t flanged beams and sign of beams for shear, bond and torsion	K6
C301.3	To plan the various types of slabs and staircase by limit state method.	K6
C301.4	To Design columns for axial, uniaxial and biaxial eccentric loadings	K6
C301.5	To design the footing of building by considering factor of safety.	K6

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C301.1	3	3	3	2	2	-	-	2	-	-	-	3	3	3
C301.2	3	3	3	2	2	-	-	2	-	-	-	3	3	3
C301.3	3	3	3	2	2	-	-	2	-	-	-	3	3	3
C301.4	3	3	3	2	2	-	-	2	-	-	-	3	3	3
C301.5	3	3	3	2	2	-	-	2	-	-	-	3	3	3
C301	3	3	3	2	2	-	-	2	-	-	-	3	3	3

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Course Code & Name : C302 & CE8502 - Structural Analysis - I		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C302.1	To <b>Analyze</b> continuous beams, pin-jointed indeterminate plane frames and rigid plane frames by strain energy method.	K4
C302.2	To <b>Analyse</b> the continuous beams and rigid frames by slope deflection method.	K4
C302.3	<b>Summarize</b> the concept of moment distribution and analysis of continuous beams and rigid frames with and without sway.	K5
C302.4	To <b>Analyse</b> the indeterminate pin jointed plane frames continuous beams and rigid frames using matrix flexibility method.	K4
C302.5	<b>Summarize</b> the concept of matrix stiffness method and analysis of continuous beams, pin jointed trusses and rigid plane frames.	K5

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C302.1	3	3	2	2	2	2	-	-	-	-	-	3	3	3
C302.2	3	3	2	2	2	2	-	-	-	-	-	3	3	3
C302.3	3	3	2	2	2	2	-	-	-	-	-	3	3	3
C302.4	3	3	2	2	2	2	-	-	-	-	-	3	3	3
C302.5	3	3	2	2	2	2	-	-	-	-	-	3	3	3
C302	3	3	2	2	2	2	-	-	-	-	-	3	3	3

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Course Code & Name : C303 & EN8491- Water Supply Engineering		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C303.1	To <b>outline</b> the structure of drinking water supply systems, including water transport, treatment and distribution.	K1
C303.2	To <b>summarize</b> the various unit operations and processes in water treatment	K5
C303.3	To <b>summarize</b> the design for various functional units in water treatment	K5
C303.4	To <b>classify</b> the water quality criteria and standards, and their relation to public health	K5
C303.5	To <b>develop</b> design and evaluate water supply project alternatives on basis of chosen criteria.	K6

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C303.1	2	-	2	2	2	2	-	2	-	-	-	2	3	2
C303.2	2	-	2	2	2	-	-	2	-	-	-	2	3	2
C303.3	2	-	2	2	2	-	-	2	-	-	-	2	3	2
C303.4	2	-	2	2	2	-	-	2	-	-	-	2	3	2
C303.5	2	2	2	2	2	-	2	2	-	-	-	2	3	2
C303	2	2	2	2	2	2	2	2	-	-	-	2	3	2

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Course Code & Name : C304 & CE8591- Foundation Engineering		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C304.1	To summarize the site investigation methods and sampling.	K5
C304.2	To develop knowledge on bearing capacity and testing methods on soil	K6
C304.3	By analyzing the loads bearing capacity of the soil design the shallow footings.	K4
C304.4	To analyse the load carrying capacity and settlement of pile foundation.	K4
C304.5	To examine the earth pressure on retaining walls to analyse soil stability.	K5

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

  
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Course Code & Name : C305 & GI8014- Geographic Information System		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C305.1	Understand the fundamentals and components of Geographic Information.	K5
C305.2	Construct spatial data models.	K4
C305.3	Apply and learn Data Input And Topology.	K4
C305.4	Understand the data quality and standards.	K3
C305.5	Derive and understand Data Management And Output.	K5

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
C305.1	3	-	-	-	1	3	-	-	-	-	3	3	3	-
C305.2	3	-	2	2	3	-	-	-	2	-	-	2	1	-
C305.3	3	3	-	-	3	-	2	3	-	3	-	-	-	2
C305.4	3	-	3	-	-	-	-	2	-	-	-	1	2	1
C305.5	3	-	3	-	3	-	-	-	-	2	1	2	3	2
C305	3	3	2.7	-	2.5	3	2	2.5	2	2.5	2	2	2.25	1.7



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Course Code & Name : C306 & OAI551 - Environment And Agriculture		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C306.1	Get a basic knowledge Globalization and its impacts	K5
C306.2	Understand and solve the problems Erosion and problems of deposition in irrigation systems	K2
C306.3	Gain knowledge about Water scarcity and water shortages.	K6
C306.4	Learn types of Ecological diversity, wild life and agriculture.	K2
C306.5	Understand and solve Agricultural environment policies and its impacts	K2

	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C306.1	2	-	-	-	-	-	2	-	-	-	-	3	-	2
C306.2	2	2	-	3	-	-	3	-	-	-	-	-	-	2
C306.3	2	-	-	2	-	-	-	-	-	-	-	3	-	1
C306.4	2	2	-	-	-	-	3	-	-	-	-	-	-	-
C306.5	3	2	-	-	-	-	-	-	-	-	-	3	-	-
C306	2.2	2	-	2.5	-	-	2.6	-	-	-	-	3	-	1.7

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Course Code & Name : C307 & CE8511- Soil Mechanics Laboratory		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C307.1</b>	To analyse the index properties of soil.	<b>K4</b>
<b>C307.2</b>	To examine the density of soil in the field using sand replacement and core cutter method.	<b>K4</b>
<b>C307.3</b>	To inspect the moisture content in the soil using the proctor compaction test.	<b>K2</b>
<b>C307.4</b>	To examine the permeability of soil using different methods	<b>K4</b>
<b>C307.5</b>	To test the soil to know its various engineering properties.	<b>K4</b>

S	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
<b>C307.1</b>	3	2	-	2	-	2	2	-	-	-	-	2	3	3
<b>C307.2</b>	3	2	-	2	-	2	2	-	-	-	-	2	3	3
<b>C307.3</b>	3	2	-	2	-	2	2	-	-	-	-	2	3	3
<b>C307.4</b>	3	2	-	2	-	2	2	-	-	-	-	2	3	3
<b>C307.5</b>	3	2	-	2	-	2	2	-	-	-	-	2	3	3
<b>C307.1</b>	3	2	-	2	-	2	2	-	-	-	-	2	3	3

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Course Code & Name : C308 & CE8512 - Water And Waste Water Analysis Laboratory		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C308.1</b>	<b>To outline</b> the influence lines for statically determinate structures and calculate critical stress resultants.	<b>K1</b>
<b>C308.2</b>	<b>To summarize</b> the Muller Breslau principle and draw the influence line for statically indeterminate beams.	<b>K5</b>
<b>C308.3</b>	<b>Analyse</b> of three hinged, two hinged and fixed arches.	<b>K4</b>
<b>C308.4</b>	<b>Analyse</b> the suspension bridges with stiffening girders	<b>K4</b>
<b>C308.5</b>	<b>To summarize</b> the concept of Plastic analysis and the method of analyzing beams and rigid frames.	<b>K5</b>

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
<b>C308.1</b>	-	-	2	2	2	-	-	-	-	-	-	3	3	2
<b>C308.2</b>	-	-	2	2	2	-	-	-	-	-	-	3	3	2
<b>C308.3</b>	-	-	2	2	2	-	-	-	-	-	-	3	3	2
<b>C308.4</b>	-	-	2	2	2	-	-	-	-	-	-	3	3	2
<b>C308.5</b>	-	-	2	2	2	-	-	-	-	-	-	3	3	2
<b>C308</b>	-	-	2	2	2	-	-	-	-	-	-	3	3	2

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Course Code & Name : C309 & CE8513 - Survey Camp		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C309.1</b>	To <b>conduct</b> the traverse survey using modern survey equipment.	<b>K5</b>
<b>C309.2</b>	To <b>divide</b> the land into blocks and carry out survey to plot contour map	<b>K5</b>
<b>C309.3</b>	To <b>find</b> the sun's azimuth angle.	<b>K5</b>
<b>C309.4</b>	<b>Make</b> use of GPS to know the latitude and longitude of the camp location.	<b>K6</b>
<b>C309.5</b>	To <b>set out</b> the curve by deflection angle.	<b>K2</b>

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
<b>C309.1</b>	3	2	3	2	3	2	-	-	-	-	-	2	3	2
<b>C309.2</b>	3	2	3	2	3	2	-	-	-	-	-	2	3	2
<b>C309.3</b>	3	2	3	2	3	2	-	-	-	-	-	2	3	2
<b>C309.4</b>	3	2	3	2	3	2	-	-	-	-	-	2	3	2
<b>C309.5</b>	3	2	3	2	3	2	-	-	-	-	-	2	3	2
<b>C309</b>	3	2	3	2	3	2	-	-	-	-	-	2	3	2

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## SEMESTER VI

Course Code & Name : C310 & CE8601- Design of Steel Structural Elements

	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C310.1</b>	<b>To Summarize</b> the concepts of various design philosophies	<b>K5</b>
<b>C310.2</b>	<b>To develop</b> the common bolted and welded connections for steel structures.	<b>K6</b>
<b>C310.3</b>	<b>Analyse</b> the tension members and understand the effect of shear lag.	<b>K4</b>
<b>C310.4</b>	<b>To Summarize</b> the design concept of axially loaded columns and column base connections.	<b>K5</b>
<b>C310.5</b>	<b>Analyse</b> the specific problems related to the design of laterally restrained and unrestrained steel beams.	<b>K2</b>

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
<b>C310.1</b>	3	3	3	3	2	2	-	2	-	-	-	3	3	2
<b>C310.2</b>	3	3	3	3	2	2	-	2	-	-	-	3	3	2
<b>C310.3</b>	3	3	3	3	2	2	-	2	-	-	-	3	3	2
<b>C310.4</b>	3	3	3	3	2	2	-	2	-	-	-	3	3	2
<b>C310.5</b>	3	3	3	3	2	2	-	2	-	-	-	3	3	2
<b>C310</b>	3	3	3	3	2	2	-	2	-	-	-	3	3	2

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Course Code & Name : C311 & CE8602- Structural Analysis -II		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C311.1	To <b>outline</b> the influence lines for statically determinate structures and calculate critical stress resultants.	K1
C311.2	To <b>summarize</b> the Muller Breslau principle and draw the influence line for statically indeterminate beams.	K5
C311.3	<b>Analyse</b> of three hinged, two hinged and fixed arches.	K4
C311.4	<b>Analyse</b> the suspension bridges with stiffening girders	K4
C311.5	To <b>summarize</b> the concept of Plastic analysis and the method of analyzing beams and rigid frames.	K5

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C311.1	3	3	2	2	2	2	-	-	-	-	-	3	3	3
C311.2	3	3	2	2	2	2	-	-	-	-	-	3	3	3
C311.3	3	3	2	2	2	2	-	-	-	-	-	3	3	3
C311.4	3	3	2	2	2	2	-	-	-	-	-	3	3	3
C311.5	3	3	2	2	2	2	-	-	-	-	-	3	3	3
C311	3	3	2	2	2	2	-	-	-	-	-	3	3	3



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Course Code & Name : C312 & CE8603- Irrigation Engineering		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C312.1</b>	<b>To outline</b> the knowledge and skills on crop water requirements.	<b>K1</b>
<b>C312.2</b>	<b>To classify</b> the methods and management of irrigation.	<b>K5</b>
<b>C312.3</b>	<b>To summarize</b> the types of Impounding structures	<b>K5</b>
<b>C312.4</b>	<b>To summarize</b> the methods of irrigation including canal irrigation.	<b>K5</b>
<b>C312.5</b>	<b>How to optimize</b> the water usage in the irrigation system.	<b>K2</b>

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
<b>C312.1</b>	2	2	-	-	-	2	2	-	-	-	-	3	3	2
<b>C312.2</b>	2	2	-	-	-	2	2	-	-	-	-	3	3	2
<b>C312.3</b>	2	2	-	-	-	2	2	-	-	-	-	3	3	2
<b>C312.4</b>	2	2	-	-	-	2	2	-	-	-	-	3	3	2
<b>C312.5</b>	2	2	-	-	-	2	2	-	-	-	-	3	3	2
<b>C312</b>	2	2	-	-	-	2	2	-	-	-	-	3	3	2

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Course Code & Name : C313 & CE8604 - Highway Engineering		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C313.1	To summarize planning and aligning of highway.	K5
C313.2	To Analyse the Geometric design of highways.	K4
C313.3	Apply the acquired knowledge on the design flexible and rigid pavements.	K3
C313.4	Recall the Highway construction materials, properties, testing methods.	K1
C313.5	To illustrate the concept of pavement management system, evaluation of distress and maintenance of pavements.	K2

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C313.1	3	3	2	-	2	2	-	2	-	-	-	2	3	2
C313.2	3	3	2	-	2	2	-	2	-	-	-	2	3	2
C313.3	3	3	2	-	2	2	-	2	-	-	-	2	3	2
C313.4	3	3	2	-	2	2	-	2	-	-	-	2	3	2
C313.5	3	3	2	-	2	2	-	2	-	-	-	2	3	2
C313	3	3	2	-	2	2	-	2	-	-	-	2	3	2



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Course Code & Name : C314 & EN8592- Wastewater Engineering		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C314.1	<b>To Summarize</b> the sewage characteristics and design sewer system including sewage pumping stations.	K5
C314.2	<b>To summarize</b> the onsite sanitation and design of primary treatment of sewage.	K5
C314.3	<b>Analyse</b> the basic performance and design of the unit operations and processes that are used in secondary sewage treatment plant.	K4
C314.4	<b>To summarize</b> the standard methods for disposal of sewage.	K5
C314.5	<b>To develop knowledge</b> on sludge treatment and methods of sludge disposal units.	K5

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C314.1	3	2	3	2	2	-	2	3	-	-	-	3	3	2
C314.2	3	2	3	2	2	-	2	2	-	-	-	3	3	2
C314.3	3	2	3	2	2	-	2	3	-	-	-	3	3	2
C314.4	3	2	3	2	2	-	2	2	-	-	-	3	3	2
C314.5	3	2	3	2	2	-	2	2	-	-	-	3	3	2
C314	3	2	3	2	2	-	2	2.4	-	-	-	3	3	2

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Course Code & Name : C315 & CE8005- Air Pollution And Control Engineering		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C315.1</b>	An <b>understanding</b> of the nature and characteristics of the air pollutants.	<b>K2</b>
<b>C315.2</b>	Knowledge on basic concepts of air quality management and ability to <b>identify</b> the various types of plume dispersion	<b>K4</b>
<b>C315.3</b>	<b>Ability</b> to select appropriate equipments and models to control the pollutants	<b>K2</b>
<b>C315.4</b>	Capability to <b>monitor</b> the air quality standards for gaseous contaminants.	<b>K3</b>
<b>C315.5</b>	The Competence to <b>identify</b> , control and prevent noise pollution.	<b>K4</b>

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
<b>C315.1</b>	3	3	-	2	-	-	-	2	-	2	2	3	3	2
<b>C315.2</b>	3	3	-	2	-	-	-	2	-	2	2	3	3	2
<b>C315.3</b>	3	3	-	2	-	-	-	2	-	3	2	3	3	2
<b>C315.4</b>	3	3	-	2	-	-	-	2	-	2	2	3	3	2
<b>C315.5</b>	3	3	-	2	-	-	-	2	-	2	2	3	3	2
<b>C315</b>	3	3	-	2	-	-	-	2	-	2.2	2	3	3	2

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Course Code & Name : C316 & CE8611- Highway Engineering Laboratory		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C316.1	Select suitable aggregate material by testing the physical properties	K4
C316.2	Determine properties of bitumen and its grade	K5
C316.3	Determine CBR value of material for subgrade and subsequent layers of pavement	K5
C316.4	Design job mix formula for bituminous surface using Marshal Stability test.	K6
C316.5	Student should be able to test of existing highway and examine the quality of that highway by Benkelman Beam Test.	K5

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C316.1	3	2	2	-	2	2	-	2	-	-	-	2	3	2
C316.2	3	2	2	-	2	2	-	2	-	-	-	2	3	2
C316.3	3	2	2	-	2	2	-	2	-	-	-	2	3	2
C316.4	3	2	2	-	2	2	-	2	-	-	-	2	3	2
C316.5	3	2	2	-	2	2	-	2	-	-	-	2	3	2
C316.1	3	2	2	-	2	2	-	2	-	-	-	2	3	2

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Course Code & Name : C317 & CE8612- Irrigation & Environmental Engineering Drawing		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C317.1	To develop the fundamental design on the tank structure.	K5
C317.2	To Analyse and design the different types of dam.	K4
C317.3	To plan and construct the structure of cross drainage system considering all the elements in it.	K6
C317.4	To plan and design the elements of water treatment plant along with pumping stations and house service connection.	K6
C317.5	To plan and design the primary, secondary treating elements of sewage water treatment plant.	K6

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C317.1	3	2	3	2	-	-	-	-	2	2	2	2	3	2
C317.2	3	2	3	2	-	-	-	-	2	2	2	2	3	2
C317.3	3	2	3	2	-	-	-	-	2	2	2	2	3	2
C317.4	3	2	3	2	-	-	-	-	2	2	2	2	3	2
C317.5	3	2	3	2	-	-	-	-	2	2	2	2	3	2
C317	3	2	3	2	-	-	-	-	2	2	2	2	3	2

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Course Code & Name : C318 & HS8581- Professional Communication		
	CO Statements	Knowledge level
The students should be able to		
C318.1	Take international examination such as IELTS and TOFEL	K2
C318.2	Participate in presentation	K2
C318.3	Play a part in group discussions	K4

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C318.1	-	-	-	-	-	-	-	-	3	3	3	3	-	-
C318.2	-	-	-	-	-	-	-	-	3	3	3	3	-	-
C318.3	-	-	-	-	-	2	-	-	3	3	3	3	-	-
C318	-	-	-	-	-	2	-	-	3	3	3	3	-	-

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## SEMESTER VII

Course Code & Name : C401 & CE8701 - Estimation, Costing and Valuation Engineering

	CO Statements	Knowledge level
<b>The students should be able to</b>		
C401.1	Explain the basic concept of quantity estimation for building, roads, canals and hydraulic structures by manual and software packages.	K5
C401.2	Acquire the knowledge to calculate rate analysis and man-hours required for the common civil works by manual and software packages.	K2
C401.3	Develop the specification for the materials used in construction, online and offline tender procedures and tender document preparation and report preparation.	K5
C401.4	Acquire the knowledge of construction contracts and contract document preparation.	K2
C401.5	Identify the valuation for building, land and plant and machineries, calculation of rent, mortgage and lease.	K4

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C401.1	3	1	2	1	-	-	-	1	-	-	-	-	3	1
C401.2	3	2	3	2	-	-	1	1	-	-	-	-	3	1
C401.3	3	2	3	3	-	-	1	1	-	-	-	-	3	1
C401.4	3	2	3	2	-	-	1	1	-	-	-	-	1	1
C401.5	2	1	1	1	-	-	1	1	-	-	-	-	3	1
C401	3	2	3	3	-	-	1	1	-	-	-	-	3	1



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Course Code & Name : C402 & CE8702- Railways, Airports, Docks and Harbour Engineering		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C402.1	Understand the methods of route alignment and design elements in Railway Planning and Constructions.	K2
C402.2	Understand the Construction techniques and Maintenance of Track laying and Railway stations.	K2
C402.3	Gain an insight on the planning and site selection of Airport Planning and design.	K6
C402.4	Analyze and design the elements for orientation of runways and passenger facility systems.	K4
C402.5	Understand the various feature in Harbours and Ports, their construction, coastal protection works and coastal Regulations to be adopted.	K2

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C402.1	3	2	2	-	2	2	-	2	-	-	-	2	3	2
C402.2	3	2	2	-	2	2	-	2	-	-	-	2	3	2
C402.3	3	2	2	-	2	2	-	2	-	-	-	2	3	2
C402.4	3	2	2	-	2	2	-	2	-	-	-	2	3	2
C402.5	3	2	2	-	2	2	-	2	-	-	-	2	3	2
C402	3	2	2	-	2	2	-	2	-	-	-	2	3	2

*[Signature]*  
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Course Code & Name : C403 & CE68703 - Structural Design and Drawing		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C403.1	<b>Design</b> and draw reinforced concrete Cantilever and Counter fort Retaining Walls	<b>K6</b>
C403.2	<b>Design</b> and draw flat slab as per code provisions	<b>K6</b>
C403.3	<b>Design</b> and draw reinforced concrete and steel bridges	<b>K6</b>
C403.4	<b>Design</b> and draw reinforced concrete and steel water tanks	<b>K6</b>
C403.5	<b>Design</b> and detail the various steel trusses and gantry girders	<b>K6</b>

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C403.1	3	3	3	3	2	2	-	-	-	-	2	3	3	3
C403.2	3	3	3	3	2	2	-	-	-	-	2	3	3	3
C403.3	3	3	3	3	2	2	-	-	-	-	2	3	3	3
C403.4	3	3	3	3	2	2	-	-	-	-	2	3	3	3
C403.5	3	3	3	3	2	2	-	-	-	-	2	3	3	3
C403	3	3	3	3	2	2	-	-	-	-	2	3	3	3

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Course Code & Name : C404 & CE8012 - Construction, Planning and Scheduling		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C404.1	Get a basic knowledge Choice of Technology and Construction method	K1
C404.2	Understand Use of Advanced Scheduling Techniques	K2
C404.3	Gain knowledge Control of project cash flows.	K4
C404.4	Analyze the Quality Control And Safety During Construction.	K4
C404.5	Understand and solve Centralized database Management systems	K2

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C404 .1	3	3	-	-	3	-	2	-	-	-	-	3	-	2
C404 .2	3	-	-	-	-	-	2	-	-	-	3	-	-	2
C404 .3	3	-	-	2	-	-	-	-	-	-	-	3	1	-
C404 .4	3	3	-	2	-	-	3	-	-	-	-	-	-	2
C404 .5	3	2	2	-	-	-	-	-	-	-	-	3	-	2
C404	3	2.6 7	2	2	3	-	2.3	-	-	-	3	3	1	2



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Course Code & Name : C405 & OME754 - Industrial Safety		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C405.1	Analyze the effect of release of toxic substances	K4
C405.2	Understand the industrial laws, regulations and source models	K5
C405.3	Apply the methods of prevention of fire and explosions	K3
C405.4	Understand the relief and its sizing methods	K5
C405.5	Understand the methods of hazard identification and preventive measures	K5

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 0	PO 1	PO 1	PSO 1	PSO 2
C405.1	-	-	2	2	2	-	-	-	-	-	-	2	2	2
C405.2	-	-	2	2	2	-	-	-	-	-	-	2	2	2
C405.3	-	-	2	2	2	-	-	-	-	-	-	2	2	2
C405.4	-	-	2	2	2	-	-	-	-	-	-	2	2	2
C405.5	-	-	2	2	2	-	2	-	-	-	-	2	2	2
C405	-	-	2	2	2	-	2	-	-	-	-	2	2	2



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Course Code & Name : C406 & CE8711- Creative and Innovative Project		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C406.1	Able to <b>design</b> any of the Civil Engineering structure	K6
C406.2	Able to interpret data, and synthesis the information to provide valid conclusions	K5
C406.3	<b>Apply</b> appropriate techniques, modern Engineering tools to engineering activities	K3
C406.4	Able to communicate effectively, manage the team or partner	K5
C406.5	<b>Apply</b> ethical principles and commit to professional ethics and responsibilities	K3

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C406.1	3	3	2	2	3	-	-	-	-	-	-	3	3	2
C406.2	3	3	2	2	3	-	-	-	-	-	-	3	3	2
C406.3	3	3	2	2	3	-	-	-	-	-	-	3	3	2
C406.4	3	3	2	2	3	-	-	-	-	-	-	3	3	2
C406.5	3	3	2	2	3	-	-	-	-	-	-	3	3	2
C406	3	3	2	2	3	-	-	-	-	-	-	3	3	2



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Course Code & Name : C407 & CE8712- Industrial Training		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>C407.1</b>	<b>To intricacies</b> of implementation textbook knowledge into practice in the chosen fields of engineering.	<b>K3</b>
<b>C407.2</b>	<b>To understand</b> the concepts of developments and implementation of new techniques by conducting research.	<b>K2</b>
<b>C407.3</b>	<b>To understand</b> the importance of sustainability and cost-effectiveness in design and developments of engineering solution.	<b>K2</b>
<b>C407.4</b>	<b>To be a multi-skilled engineer</b> with good technical knowledge, management, leadership and entrepreneurship skills through continuous professional development and life-long learning.	<b>K6</b>
<b>C407.5</b>	<b>To create</b> an awareness of the social, cultural, global and environmental responsibility as an engineer.	<b>K6</b>

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
<b>C407.1</b>	3	3	2	2	3	-	-	-	-	-	-	3	3	2
<b>C407.2</b>	3	3	2	2	3	-	-	-	-	-	-	3	3	2
<b>C407.3</b>	3	3	2	2	3	-	-	-	-	-	-	3	3	2
<b>C407.4</b>	3	3	2	2	3	-	-	-	-	-	-	3	3	2
<b>C407.5</b>	3	3	2	2	3	-	-	-	-	-	-	3	3	2
<b>C407</b>	3	3	2	2	3	-	-	-	-	-	-	3	3	2



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## SEMESTER VIII

Course Code & Name : C408 & CE8020 - Maintenance, Repair & Rehabilitation of Structures		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
C408.1	To understand the importance of maintenance and assessment method of distressed structures.	K2
C408.2	To gain knowledge on the strength and durability properties, their effects due to climate and temperature.	K2
C408.3	To get exposures on recent development in concrete and special concrete properties and its application. .	K2
C408.4	To understand the different techniques available for repair and protection methods	K2
C408.5	To acquire information on repair, rehabilitation, retrofitting of structures and different demolition methods	K2

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C408.1	-	-	-	3	-	3	-	2	-	-	-	3	2	-
C408.2	-	-	-	3	-	3	-	2	-	-	-	3	2	-
C408.3	-	-	-	2	-	3	-	2	-	-	-	3	1	-
C408.4	-	-	-	3	-	3	-	2	-	-	-	3	2	-
C408.5	-	-	-	3	-	3	-	2	-	-	-	2	1	-
C408	-	-	-	2.8	-	3	-	2	-	-	-	2.8	1.6	-



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Course Code & Name : C409 & CE8013 – COASTAL ENGINEERING		
	CO Statements	Knowledge level
The students should be able to		
C409.1	Understand coastal engineering aspects of harbors methods to improve navigation	K2
C409.2	Understand the wave properties and analysis of wave.	K2
C409.3	Understand the concepts of sediment transport.	K2
C409.4	Design of shore defense structures.	K6
C409.5	Gain knowledge in modeling in coastal engineering	K4

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
C409.1	2	2	-	-	2	2	2	-	-	-	-	2	3	2
C409.2	2	2	-	-	2	2	2	-	-	-	-	2	3	2
C409.3	2	2	-	-	2	2	2	-	-	-	-	2	3	2
C409.4	2	2	-	-	2	2	2	-	-	-	-	2	3	2
C409.5	2	2	-	-	2	2	2	-	-	-	-	2	3	2
C409	2	2	-	-	2	2	2	-	-	-	-	2	3	2

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Course Code & Name : C410 & CE8811 - Project Work		
	CO Statements	Knowledge level
<b>The students should be able to</b>		
<b>CO410.1</b>	<b>To understand</b> professional and ethical responsibilities.	<b>K2</b>
<b>CO410.2</b>	<b>An ability</b> to use of various techniques, engineering knowledge and skill, and modern engineering tools necessary for planning, analysis and designing of engineering projects like building, roads, geotechnical works/problems	<b>K2</b>
<b>CO410.3</b>	<b>Recognition</b> of the need for new raw materials and ability to use them in the construction materials.	<b>K4</b>
<b>CO410.4</b>	<b>Knowledge</b> of contemporary issues in the environment.	<b>K3</b>
<b>CO410.5</b>	<b>Ability</b> to handle the challenging issues and formulate the solutions for it.	<b>K2</b>

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PS O 1	PS O 2
<b>CO410 .1</b>	3	3	2	2	3	-	-	-	-	-	-	3	3	2
<b>CO410 .2</b>	3	3	2	2	3	-	-	-	-	-	-	3	3	2
<b>CO410 .3</b>	3	3	2	2	3	-	-	-	-	-	-	3	3	2
<b>CO410 .4</b>	3	3	2	2	3	-	-	-	-	-	-	3	3	2
<b>CO410 .5</b>	3	3	2	2	3	-	-	-	-	-	-	3	3	2
<b>C0410</b>	3	3	2	2	3	-	-	-	-	-	-	3	3	2

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## DEPARTMENT OF CIVIL ENGINEERING

PROGRAM OUTCOME CONSOLIDATE SHEET- 2017 & 2021 Regulation (2019- 2023) BATCH																	
Se me ster	Cour se Code	AU Cours e Code	Course Name	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2
1	C101	HS315 1	Professional English - I	-	-	-	-	2	-	-	2	3	3	3	3	2	-
	C102	MA31 51	Matrices and Calculus	3	3	1	-	2	-	-	2	1	-	-	3	1	1
	C103	PH315 1	Engineering Physics	3	3	2	3	3	1	2	2	1	2	-	3	1	1
	C104	CY315 1	Engineering Chemistry	3	2	2	1	1	1	3	2	-	1	-	2	1	1
	C105	GE315 1	Problem Solving And Python Programming	2	3	3	3	2	-	-	-	-	-	2	2	3	3
	C106	GE317 1	Problem Solving And Python Programming Laboratory	3	3	3	3	2	-	-	-	-	-	2	2	3	3
	C107	BS317 1	Physics And Chemistry Laboratory	3	3	2	3	3	1	2	2	1	2	-	3	1	1
2	C108	HS325 1	Professional English - II	-	-	-	-	2	-	-	2	3	3	3	3	2	-
	C109	MA32 51	Statistics and Numerical Methods	3	3	1	-	2	-	-	2	1	-	-	3	1	1
	C110	PH320 1	Physics for Civil Engineering	3	3	2	3	3	1	2	2	1	2	-	3	1	1
	C111	BE325 2	Basic Electrical, Electronics and Instrumentation Engineering	3	3	2	-	-	1	1	2	-	2	3	3	2	2
	C112	GE325 1	Engineering Graphics	3	3	2	1	3	2	-	2	-	2	-	3	2	2
	C113	GE327 1	Engineering Practices Laboratory	3	3	3	1	3	3	-	3	-	2	2	3	2	2
	C114	BE327 2	Basic Electrical, Electronics and Instrumentation Engineering Laboratory	3	3	2	-	-	1	1	2	-	2	3	3	2	2
3	C201	MA33 51	Transforms And Partial Differential Equations	2. 6	2. 6	2. 3	1. 6	2. 6	1. 6	-	-	-	-	-	2	2	2
	C202	Me335 1	Engineering Mechanics	3	3	2	2	2	-	-	-	-	-	-	2	2	2
	C203	CE330 1	Fluid Mechanics	3	2. 6	2. 2	2	1	2	2	2	-	-	2	-	2. 8	2. 66
	C204	CE330 2	Construction Materials and Technology	2. 5	2	-	-	3	2	-	2	-	-	-	2	3	2
	C205	CE330 3	Water Supply and Waste Water Engineering	-	3	3	2	3	-	-	2	-	-	-	3	3	2
	C206	CE335	Surveying and Levelling	-	2	2	-	2	-	-	-	-	-	-	2	2	-



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		1																
	C207	C3361	Surveying and Levelling Laboratory	2	-	2	2	2	2	2	2	-	-	-	2	2	-	
	C208	CE331 1	Water And Waste Water Analysis Laboratory	2	2	2	2	3	2	-	-	2	1	-	2	2	2	
	C209	GE336 1	Professional Development	-	-	-	-	-	-	-	-	2	3	-	2	3	3	
4	C210	CE340 1	Applied Hydraulics Engineering	3	2	-	2	2	3	-	-	-	2	-	1	2	2	
	C211	CE340 2	Strength of Materials	-	2	-	-	2	2	-	2	-	-	2	2	2	2	
	C212	CE340 3	Concrete Technology	3	3	2	2	2	-	-	-	-	-	-	2	2	2	
	C213	CE340 4	Soil Mechanics	2. 6	2. 4	-	2	-	-	-	2	-	-	-	2	-	-	
	C214	CE340 5	Highway and Railway Engineering	3	2	-	2	-	-	2	2	-	-	-	3	3	2	
	C215	GE345 1	Environmental Sciences and Sustainability	3	3	3	2	2	2	-	2	2	2	-	3	3	3	
	C216	CE341 1	Hydraulic Engineering Laboratory	3	3	3	3	-	-	-	3	3	3	-	2	3	3	
	C217	CE341 2	Materials testing laboratory	3	3	-	-	-	2	-	3	3	3	-	2	3	3	
	C218	CE341 3	Soil Mechanics laboratory	-	-	-	-	-	-	-	3	2	2	3	3	-	-	
	5	C301	CE850 1	Design of Reinforced Cement Concrete Elements	3	3	3	2	2	-	-	2	-	-	-	3	3	3
C302		CE850 2	Structural Analysis - I	3	3	2	2	2	2	-	-	-	-	-	3	3	3	
C303		EN849 1	Water Supply Engineering	2	2	2	2	2	2	2	2	-	-	-	2	3	2	
C304		CE859 1	Foundation Engineering	2	3	-	2	-	2	-	-	-	-	-	3	3	2	
C305		GI801 4	Geographic Information System	3	3	2 7	-	2 5	3	2	2	2	2	2	2	2	2	1. 7
C306		OAI55 1	Environment And Agriculture	2. 2	2	-	2. 5	-	-	2. 6	-	-	-	-	3	-	1. 7	
C307		CE851 1	Soil Mechanics Laboratory	3	2	-	2	-	2	2	-	-	-	-	2	3	3	
C308		CE851 2	Water And Waste Water Analysis Laboratory	-	-	2	2	2	-	-	-	-	-	-	3	3	2	
C309		CE851 3	Survey Camp	3	2	3	2	3	2	-	-	-	-	-	2	3	2	
C310		CE860 1	Design of Steel Structural Elements	3	3	3	3	2	2	-	2	-	-	-	3	3	2	



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6	C311	CE860 2	Structural Analysis - II	3	3	2	2	2	2	-	-	-	-	-	3	3	3	
	C312	CE860 3	Irrigation Engineering	2	2	-	-	-	2	2	-	-	-	-	3	3	2	
	C313	CE860 4	Highway Engineering	3	3	2	-	2	2	-	2	-	-	-	2	3	2	
	C314	EN859 2	Wastewater Engineering	3	2	3	2	2	-	2	2	-	-	-	3	3	2	
	C315	CE800 5	Air Pollution And Control Engineering	3	3	-	2	-	-	-	2	-	2	2	3	3	2	
	C316	CE861 1	Highway Engineering Laboratory	3	2	2	-	2	2	-	2	-	-	-	2	3	2	
	C317	CE861 2	Irrigation & Environmental Engineering Drawing	3	2	3	2	-	-	-	-	2	2	2	2	3	2	
	C318	HS858 1	Professional Communication	-	-	-	-	-	2	-	-	3	3	3	3	-	-	
7	C401	CE870 1	Estimation, Costing and Valuation Engineering	3	2	3	3	-	-	1	1	-	-	-	3	1		
	C402	CE870 2	Railways, Airports, Docks and Harbour Engineering	3	2	2	-	2	2	-	2	-	-	-	2	3	2	
	C403	CE870 3	Structural Design and Drawing	3	3	3	3	2	2	-	-	-	-	2	3	3	3	
	C404	CE801 2	Construction, Planning and Scheduling	3	2	2	2	3	-	2	3	-	-	-	3	3	1	2
	C405	OME7 54	Industrial Safety	-	-	2	2	2	-	2	-	-	-	-	2	2	2	
	C406	CE871 1	Creative and Innovative Project	3	3	2	2	3	-	-	-	-	-	-	3	3	2	
	C407	CE871 2	Industrial Training	3	3	2	2	3	-	-	-	-	-	-	3	3	2	
8	C408	CE802 0	Maintenance, Repair & Rehabilitation of Structures	-	-	-	2	8	-	3	-	2	-	-	2	1	-	
	C409	CE801 3	Coastal Engineering	2	2	-	-	2	2	2	-	-	-	-	2	3	2	
	C410	CE881 1	Project Work	3	3	2	2	3	-	-	-	-	-	-	3	3	2	
<b>AVERAGE</b>				<b>2.</b>	<b>2.</b>	<b>2.</b>	<b>1.</b>	<b>2.</b>	<b>1.</b>	<b>1.</b>	<b>1.</b>	<b>2.</b>	<b>1.</b>	<b>1.</b>	<b>2.</b>	<b>2.</b>	<b>2.</b>	
				<b>7</b>	<b>3</b>	<b>1</b>	<b>9</b>	<b>0</b>	<b>9</b>	<b>5</b>	<b>9</b>	<b>0</b>	<b>98</b>	<b>74</b>	<b>43</b>	<b>51</b>	<b>15</b>	
				<b>0</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>8</b>	<b>1</b>	<b>6</b>	<b>9</b>	<b>0</b>						

### ATTAINMENT OF COURSE OUTCOMES

Describe the assessment processes used together the data upon which the evaluation of Course Outcome is based.

Cos Assessment Process:

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- For all the courses and for all the internal examinations (Continuous Assessment Test for Theory courses, model examination for practical courses), the course handling faculty prepares the question papers in such a way that it covers all the course outcomes. The course handling faculty evaluates the answer scripts of all the Continuous Assessment Test (CAT).
- For all the courses, the affiliating university takes control of the end semester examinations in terms of both the preparation of question papers and the evaluation of answer scripts.
- For theory courses, the internal assessment is based on the students' performance in 3 Internal Assessment Test (IAT) namely IAT 1, IAT 2, IAT 3 and the external assessment is rely on the end semester university examinations.
- For laboratory courses, the internal assessment is based on the marks scored by the students in observation notebook, record note book and their performance in model examination and the external assessment is rely on the end semester university examinations.
- For Project work course, the internal assessment is based on the students' performance in 3 reviews namely Review 1, Review 2, Review 3 and the external assessment is rely on the end semester university examinations.
- The marks obtained by the students in the internal assessment and the external assessment are combined and stratified into various bands by the department assessment committee in consultation with all the faculty members.
- Goal is set for computing COs attainment in terms of mark range, and the percentage of students getting marks reaches that range.
- Three different scores are attributed to different level of overall performance as 1 or 2or3.
- The percentage of students obtaining the mark, set as the goal, is considered for computing the COs attainment. 20% weightage is given for internal assessment and80% weightage is given for the external assessment conducted by Anna University. Based on this, Cos attainment is computed.
- The COs target for each of the courses is set as equal to the maximum attainment level, i.e.3.



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- If the set COs target is not achieved, root cause is analyzed and necessary actions are taken to achieve the same in the subsequent academic year.

## Method of data collection for computing Cos attainment:

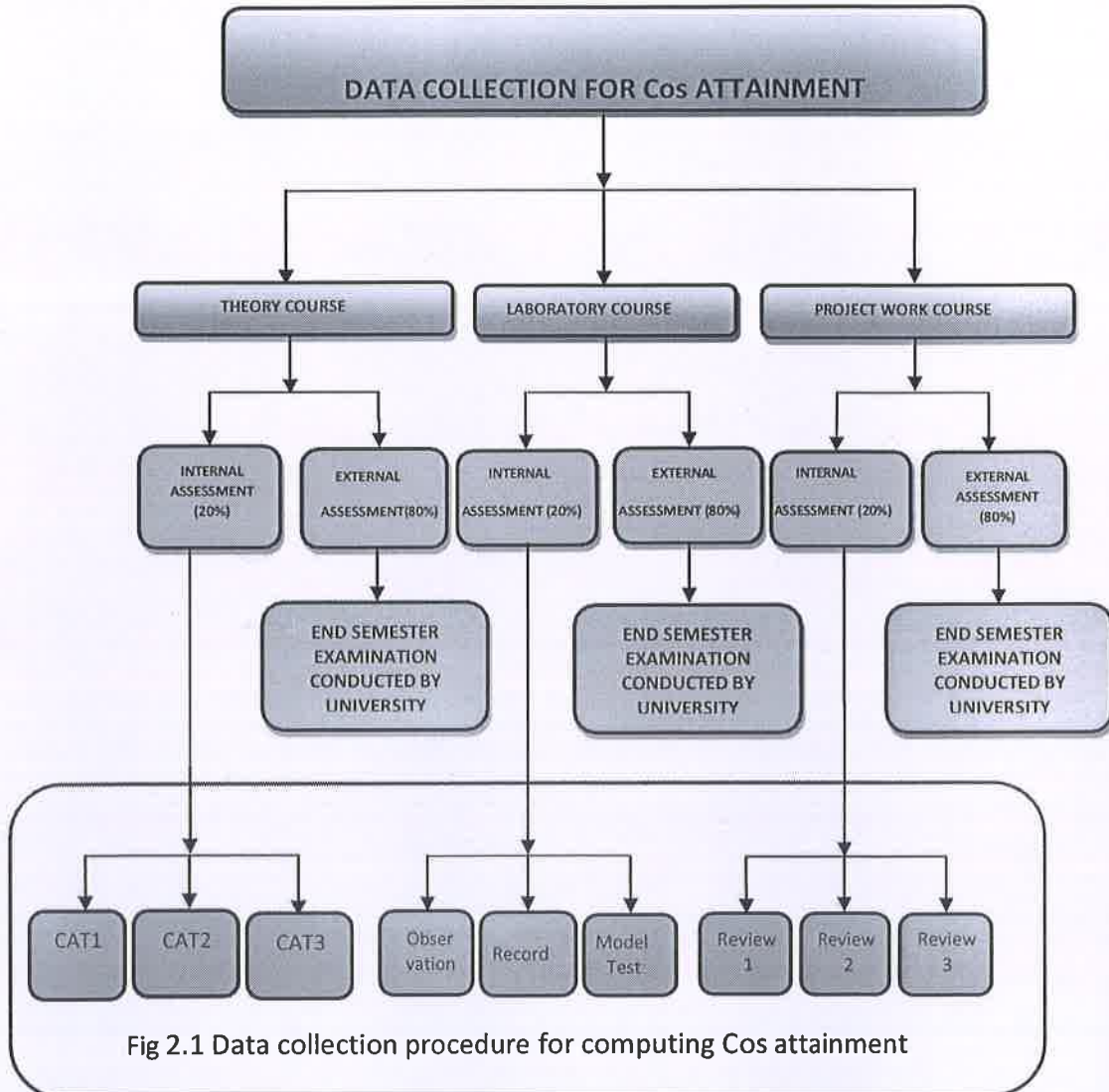


Fig 2.1 Data collection procedure for computing Cos attainment

Fig 2.1 DATA COLLECTION PROCEDURE FOR COMPUTING COS ATTAINMENT

The data collection process involved for computing Cos attainment is shown in Figure 2.1.



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The overall COs attainment for any course is equal to the sum of 80% of attainment based on external assessment and 20% of attainment in various modes of internal assessment.

$$\text{Attainment Level} = (0.8 \times \text{Attainment level based on University Examination marks}) + (0.2 \times \text{Attainment level based on Continuous Assessment Test marks})$$

A sample of Cos and POs/PSOs attainment calculation is shown.

Record the attainment of Course Outcomes of all courses with respect to set Attainment levels.

## EVALUATION CRITERIA FOR COMPUTING ATTAINMENT LEVEL FOR 2018-2022

### Internal Assessment:

The attainment levels are as follows:

- Attainment Level
- Attainment Level
- Attainment Level

### External Assessment:

The attainment levels are as follows:

- Attainment Level
- Attainment Level
- Attainment Level

The overall Cos attainment for any course is equal to the sum of attainment based on students' performance in the end semester examinations conducted by the university and attainment in Continuous Assessment Tests (Internal examinations).

$$\text{Attainment Level} = (0.8 \times \text{Attainment level based on University Examination marks}) + (0.2 \times \text{Attainment level based on Continuous Assessment Test marks})$$



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## COURSE OUTCOME ATTAINMENT FOR ALL COURSES INCLUDING FIRST YEAR COURSES FOR 2019-23 BATCH

Sem	Course Code	AU Course Code	Course Name	Attainment by external assessment	Attainment by external assessment (80%)	Attainment by internal assessment	Attainment by internal assessment 20%	Total attainment
1	C101	HS3151	Professional English - I	3	2.4	3	0.6	3
	C102	MA3151	Matrices and Calculus	2	1.6	2	0.4	2
	C103	P PH3151	Engineering Physics	2	1.6	2	0.4	2
	C104	CY3151	Engineering Chemistry	3	2.4	2	0.4	2.8
	C105	GE3151	Problem Solving And Python Programming	3	2.4	2	0.6	3
	C106	GE3171	Problem Solving And Python Programming Laboratory	2	1.6	3	0.6	2.2
	C107	BS3171	Physics And Chemistry Laboratory	3	2.4	3	0.6	3
2	C108	HS3251	Professional English - II	3	2.4	3	0.6	3
	C109	MA3251	Statistics and Numerical Methods	2	1.6	2	0.4	2
	C110	PH320 1	Physics for Civil Engineering	3	2.4	3	0.6	3
	C111	BE325 2	Basic Electrical, Electronics and Instrumentation Engineering	3	2.4	3	0.6	3
	C112	GE3251	Engineering Graphics	2	1.6	2	0.4	2
	C113	GE3271	Engineering Practices Laboratory	3	2.4	3	0.6	3
	C114	BE327 2	Basic Electrical, Electronics and Instrumentation Engineering Laboratory	3	2.4	3	0.6	3
3	C201	MA3351	Transforms And Partial Differential Equations	1	0.8	2	0.4	1.2
	C202	Me3351	Engineering Mechanics	3	2.4	3	0.6	3

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	C203	CE3301	Fluid Mechanics	2	1.6	2	0.4	2
	C204	CE3302	Construction Materials and Technology	2	1.6	2	0.4	2
	C205	CE3303	Water Supply and Waste Water Engineering	3	2.4	3	0.6	3
	C206	CE3351	Surveying and Levelling	3	2.4	3	0.6	3
	C207	C3361	Surveying and Levelling Laboratory	3	2.4	3	0.6	3
	C208	CE3311	Water And Waste Water Analysis Laboratory	3	2.4	3	0.6	3
	C209	GE3361	Professional Development	2	1.6	2	0.4	2
	4	C210	CE3401	Applied Hydraulics Engineering	2	1.6	2	0.4
C211		CE8401	Construction Techniques And Practices	3	2.4	2	0.4	2.8
C212		CE8402	Strength of Materials - II	3	2.4	3	0.6	3
C213		CE8403	Applied Hydraulic Engineering	3	2.4	3	0.6	3
C214		CE8404	Concrete Technology	3	2.4	2	0.4	2.8
C215		CE8491	Soil Mechanics	3	2.4	3	0.6	3
C216		CE8481	Strength of Materials Laboratory	3	2.4	3	0.6	3
C217		CE8461	Hydraulic Engineering Laboratory	3	2.4	3	0.6	3
C218		HS8461	Advanced Reading And Writing	2	1.6	2	0.4	2
5		C301	CE8501	Design of Reinforced Cement Concrete Elements	3	2.4	3	0.6
	C302	CE8502	Structural Analysis - I	3	2.4	3	0.6	3
	C303	EN8491	Water Supply Engineering	3	1.6	3	0.4	2
	C304	CE8591	Foundation Engineering	3	2.4	3	0.6	3
	C305	GI8013	Advanced Surveying	3	2.4	3	0.6	3
	C306	OAI551	Environment And Agriculture	3	2.4	3	0.6	3
	C307	CE8511	Soil Mechanics Laboratory	3	2.4	3	0.6	3





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	C308	CE8512	Water And Waste Water Analysis Laboratory	3	2.4	3	0.6	3
	C309	CE8513	Survey Camp	3	2.4	3	0.6	3
6	C310	CE8601	Design of Steel Structural Elements	3	2.4	3	0.6	3
	C311	CE8602	Structural Analysis - II	3	2.4	3	0.6	3
	C312	CE8603	Irrigation Engineering	3	2.4	3	0.4	2.8
	C313	CE8604	Highway Engineering	3	2.4	3	0.6	3
	C314	EN8592	Wastewater Engineering	3	2.4	3	0.6	3
	C315	CE8005	Air Pollution And Control Engineering	3	2.4	3	0.6	3
	C316	CE8611	Highway Engineering Laboratory	3	2.4	3	0.6	3
	C317	CE8612	Irrigation & Environmental Engineering Drawing	3	2.4	2	0.4	2.8
	C318	HS8581	Professional Communication	3	2.4	3	0.6	3
	7	C401	CE8701	Estimation, Costing and Valuation Engineering	3	2.4	3	0.6
C402		CE8702	Railways, Airports, Docks and Harbour Engineering	3	2.4	3	0.4	2.8
C403		CE8703	Structural Design and Drawing	3	2.4	3	0.6	3
C404		CE8012	Construction, Planning and Scheduling	3	2.4	3	0.4	2.8
C405		OME754	Industrial Safety	3	2.4	3	0.6	3
C406		CE8711	Creative and Innovative Project	3	2.4	3	0.6	3
C407		CE8712	Industrial Training	3	2.4	3	0.6	3
8	C408	CE8020	Maintenance, Repair & Rehabilitation of Structures	3	2.4	3	0.6	3
	C409	GE8076	Professional Ethics In Engineering	3	2.4	3	0.6	3
	C410	CE8811	Project Work	3	2.4	3	0.6	3
<b>AVERAGE</b>								<b>2.76</b>

## ATTAINMENT OF PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES

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**Describe assessment tools and processes used for measuring the attainment of each of the Program Outcomes and Program Specific Outcomes**

- POs/PSOs overall attainment are assessed for every out going batch.
- The POs/PSOs attainment are assessed in 2 parts and then combined together to get the final score. First part being the direct assessment part while the second part is being the indirect assessment part.
- POs/PSOs attainment = Direct assessment part (80% weightage) + Indirect assessment part (20%weightage)

### **POs/PSOs attainment assessment (Direct part):**

- It is computed by averaging the Cos attainment of all courses corresponding to each of the POs/PSOs.

A sample of COs and POs/PSOs attainment (direct part) calculation is shown.

### **POs/PSOs attainment assessment (Indirect part):**

- It is done by collecting and analyzing the feedback which is received through Exit survey.
- Exit Survey is carried out every year with all the outgoing students who are completing their study in the concerned Program. Survey questionnaire are mapped to relevant POs/PSOs.
- All the surveys are made in a 3 point scale. The average value of the score obtained through the survey is taken for computing POs/PSOs attainment.



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**A sample of these surveys is provided.**

- At the end of every year, the overall POs/PSOs attainments of the passing out batch are arrived by aggregating COs attainment of all the courses mapped to specific POs/PSOs. 80% of Direct Attainment (through COs attainment) and 20% of Indirect Attainment (through Exit Survey) are summed up and the overall POs/PSOs attainment is calculated.

### **Process involved in setting the target for POs/PSOs:**

- Course to POs/PSOs index is calculated as an average mapping value of all the 5COs defined for a course to respective POs/PSOs. COs having no correlation are ignored in computing the course to POs/PSOs index computation.
- Target for each of the POs/PSOs are set as equal to the average value of course to POs/PSOs mapping index computed overall the courses, the students have undergone.



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The process of POs/PSOs attainment computation is shown in the fig 2.2

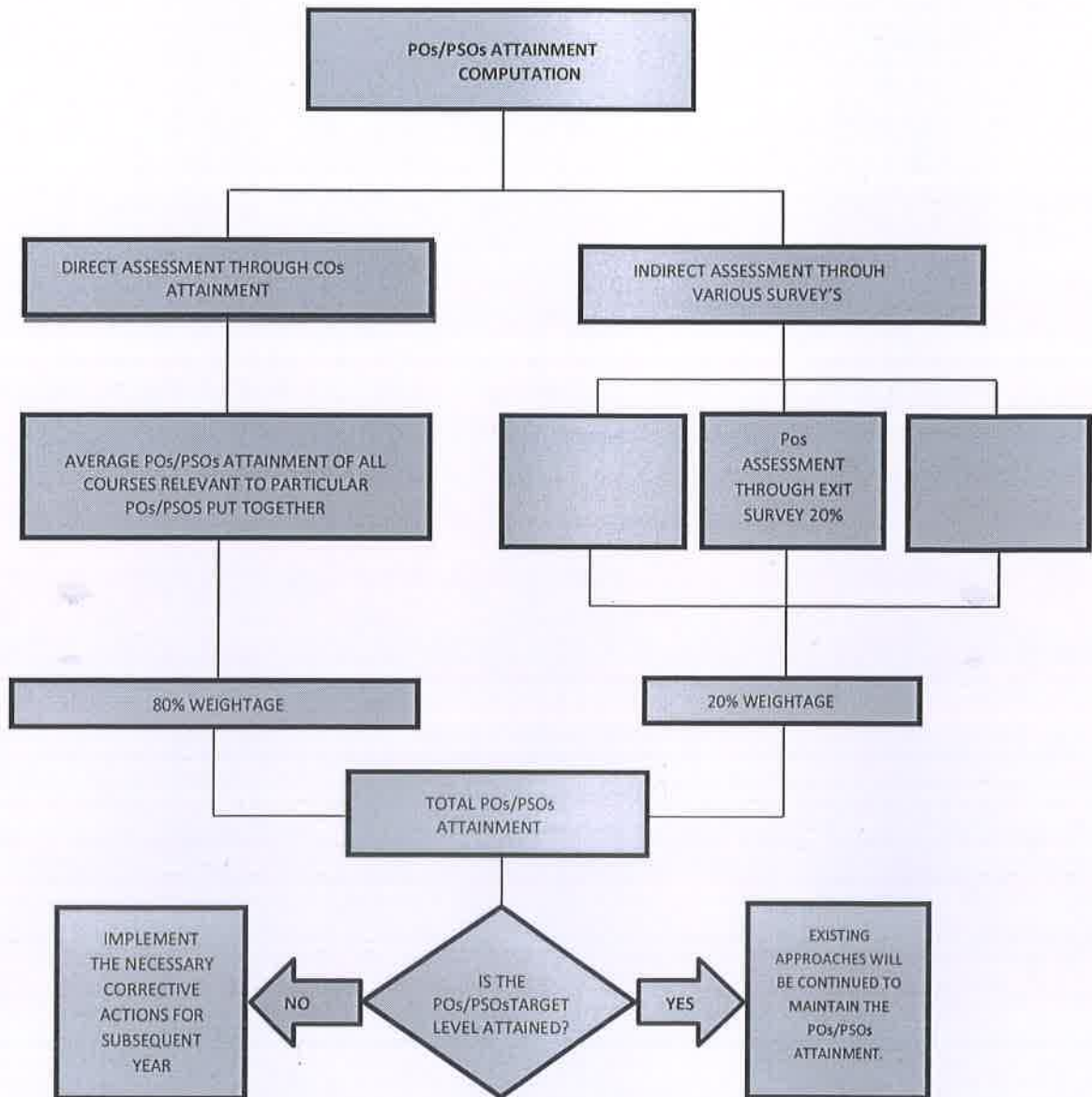



Fig-2.2. Process of POs/PSOs attainment computation

  
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## PROVIDE RESULTS OF EVALUATION OF EACH POs & PSOs

Program shall set Program Outcome attainment levels for all Pos & PSOs.

(The attainment levels by direct (student performance) and indirect (surveys) are to be presented through Program level Course –Pos & PSOs matrix as indicated).

Semester	Course Code	AU Course Code	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	PO 10	PO 11	PO 12	PS O1	PS O2
1	C101	HS3151	-	-	-	-	2	-	-	2	3	3	3	3	2	-
	C102	MA3151	3	3	1	-	2	-	-	2	1	-	-	3	1	1
	C103	PH3151	3	3	2	3	3	1	2	2	1	2	-	3	1	1
	C104	CY3151	3	2	2	1	1	1	3	2	-	1	-	2	1	1
	C105	GE3151	2	3	3	3	2	-	-	-	-	-	2	2	3	3
	C106	GE3171	3	3	3	3	2	-	-	-	-	-	2	2	3	3
	C107	BS3171	3	3	2	3	3	1	2	2	1	2	-	3	1	1
2	C108	HS3251	-	-	-	-	2	-	-	2	3	3	3	3	2	-
	C109	MA3251	3	3	1	-	2	-	-	2	1	-	-	3	1	1
	C110	PH3201	3	3	2	3	3	1	2	2	1	2	-	3	1	1
	C111	BE3252	3	3	2	-	-	1	1	2	-	2	3	3	2	2
	C112	GE3251	3	3	2	1	3	2	-	2	-	2	-	3	2	2
	C113	GE3271	3	3	3	1	3	3	-	3	-	2	2	3	2	2
	C114	BE3272	3	3	2	-	-	1	1	2	-	2	3	3	2	2
3	C201	MA3351	2.6	2.6	2.3	1.6	2.6	1.6	-	-	-	-	-	2	2	2
	C202	Me3351	3	3	2	2	2	-	-	-	-	-	-	2	2	2
	C203	CE3301	3	2.6	2.2	2	1	2	2	2	-	-	2	-	2.8	2.6
	C204	CE3302	2.5	2	-	-	3	2	-	2	-	-	-	2	3	2
	C205	CE3303	-	3	3	2	3	-	-	2	-	-	-	3	3	2
	C206	CE3351	-	2	2	-	2	-	-	2	-	-	-	2	2	-



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	C207	C3361	2	-	2	2	2	2	2	2	-	-	-	2	2	-
	C208	CE3311	2	2	2	2	3	2	-	-	2	1	-	2.2	2	2
	C209	GE3361	-	-	-	-	-	-	-	-	2	3	-	2	3	3
4	C210	CE3401	3	2	-	2	2	3	-	-	-	2	-	1	2	2
	C211	CE8401	-	2	-	-	2	2	-	2	-	-	2	2	2	2
	C212	CE8402	3	3	2	2	2	-	-	-	-	-	-	2	2	2
	C213	CE8403	2. 6	2. 4	-	2	-	-	-	2	-	-	-	2	-	-
	C214	CE8404	3	2	-	2	-	-	2	2	-	-	-	3	3	2
	C215	CE8491	3	3	3	2	2	2	-	2	2	2	-	3	3	3
	C216	CE8481	3	3	3	3	-	-	-	3	3	3	-	2	3	3
	C217	CE8461	3	3		3		2		3	3	3		2	3	3
	C218	HS8461	-	-	-	-	-	-	-	3	2	2	3	3	-	-
5	C301	CE8501	3	3	3	2	2	-	-	2	-	-	-	3	3	3
	C302	CE8502	3	3	2	2	2	2	-	-	-	-	-	3	3	3
	C303	EN8491	2	2	2	2	2	2	2	-	-	-	-	2	3	2
	C304	CE8591	2	3	-	2	-	2	-	-	-	-	-	3	3	2
	C305	GI8014	3	3	2. 7	-	2. 5	3	2	2. 5	2	2.5	2	2	2.2 5	1.7
	C306	OAI551	2. 2	2	-	2. 5	-	-	2. 6	-	-	-	-	3	-	1.7
	C307	CE8511	3	2	-	2	-	2	2	-	-	-	-	2	3	3
	C308	CE8512	-	-	2	2	2	-	-	-	-	-	-	3	3	2
	C309	CE8513	3	2	3	2	3	2	-	-	-	-	-	2	3	2
6	C310	CE8601	3	3	3	3	2	2	-	2	-	-	-	3	3	2
	C311	CE8602	3	3	2	2	2	2	-	-	-	-	-	3	3	3
	C312	CE8603	2	2	-	-	-	2	2	-	-	-	-	3	3	2
	C313	CE8604	3	3	2	-	2	2	-	2	-	-	-	2	3	2
	C314	EN8592	3	2	3	2	2	-	2	2. 4	-	-	-	3	3	2

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	C315	CE8005	3	3	-	2	-	-	-	2	-	2.2	2	3	3	2
	C316	CE8611	3	2	2	-	2	2	-	2	-	-	-	2	3	2
	C317	CE8612	3	2	3	2	-	-	-	-	2	2	2	2	3	2
	C318	HS8581	-	-	-	-	-	2	-	-	3	3	3	3	-	-
7	C401	CE8701	3	2	3	3	-	-	1	1	-	-	-	-	3	1
	C402	CE8702	3	2	2	-	2	2	-	2	-	-	-	2	3	2
	C403	CE8703	3	3	3	3	2	2	-	-	-	-	2	3	3	3
	C404	CE8012	3	2.67	2	2	3	-	2.3	-	-	-	3	3	1	2
	C405	OME754	-	-	2	2	2	-	2	-	-	-	-	2	2	2
	C406	CE8711	3	3	2	2	3	-	-	-	-	-	-	3	3	2
	C407	CE8712	3	3	2	2	3	-	-	-	-	-	-	3	3	2
8	C408	CE8020	-	-	-	2.8	-	3	-	2	-	-	-	2.8	1.6	-
	C409	GE8076	2	2	-	-	2	2	2	-	-	-	-	2	3	2
	C410	CE8811	3	3	2	2	3	-	-	-	-	-	-	3	3	2
AVERAGE			2.7	2.39	2.19	1.99	2.08	1.91	1.56	1.99	2	1.98	1.74	2.43	2.51	2.15
DIRECT			2.5	2.2	2	1.8	1.9	1.8	1.4	1.8	1.8	1.8	1.6	2.2	2.3	2
INDIRECT			2.91	2.74	2.83	2.74	2.91	2.74	2.83	2.74	2.91	2.7	2.8	2.7	2.7	3
DIRECT-80%			1.99	1.76	1.61	1.46	1.53	1.4	1.14	1.46	1.47	1.4	1.2	1.7	1.8	1.5
INDIRECT-20%			0.58	0.55	0.57	0.55	0.58	0.55	0.57	0.55	0.58	0.5	0.5	0.5	0.5	0.6
PO ATTAINMENT			2.57	2.31	2.18	2.01	2.11	1.95	1.71	2.01	2.05	2.0	1.8	2.3	2.3	2.1
TARGET			2.7	2.39	2.19	1.99	2.08	1.91	1.56	1.99	2	1.98	1.74	2.43	2.51	2.15

*[Signature]*  
PRINCIPAL



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Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.

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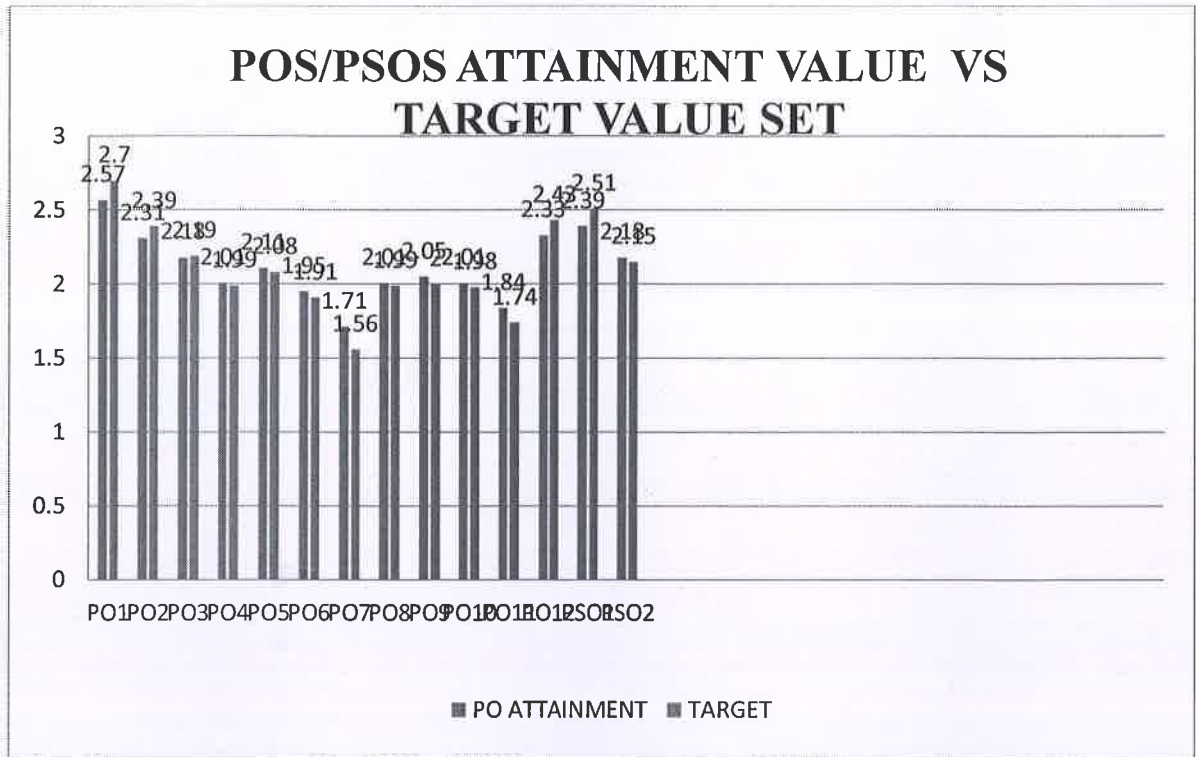
T.N. Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506.



## DEPARTMENT OF CIVIL ENGINEERING

### POs/PSOs ATTAINMENT CHART

BATCH: 2019-2023



### POs/PSOs ATTAINMENT Vs TARGET CHART

*[Handwritten Signature]*

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J.K.K. MUNIRAJAH COLLEGE  
OF TECHNOLOGY  
T.N. PALAYAM (Po)-638 506.  
GOBI (TK), ERODE (DT).