

CURRICULUM & SYLLABUS



CHOICE BASED CREDIT SYSTEM (CBCS)

FOR

BACHELOR OF TECHNOLOGY (B.Tech.)

(4 Year Undergraduate Degree Programme)

IN

CIVIL ENGINEERING

(In Alignment with National Education Policy, 2020)

[w. e. f. 2023-24]

**FACULTY OF ENGINEERING AND TECHNOLOGY
SRM UNIVERSITY DELHI-NCR, SONEPAT
Plot No.39, Rajiv Gandhi Education City, P.S. Rai, Sonapat
Haryana-131029**

SRM UNIVERISTY DELHI-NCR, SONEPAT FACULTY OF ENGINEERING AND TECHNOLOGY

ENGINEERING GRADUATES EMPLOYABILITY ATTRIBUTES (EGEAs):

Sound Knowledge and Skills of Basic Sciences & Engineering Sciences:

An Engineer should be able to apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

Problem Formulation, Analysis & Solving:

An Engineer should be able to identify, formulate, review research literature, and analyze complex Engineering problems reaching substantiated conclusions using principles of mathematics, natural sciences, and engineering sciences.

Design and Development of a Solution:

An Engineer must be able to 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.

Investigation:

An Engineer should 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.

Modern Tools Usage:

An Engineer should be able to 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.

The Engineer and the Society:

An Engineer should be able to 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.

Effective Communication Skills:

An Engineer should be able to 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.

Individual and Teamwork:

An Engineer should be able to function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Lifelong Learning:

An Engineer must 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.

Environment and Sustainability:

An Engineer must understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Professional Ethics:

An Engineer should be able to apply ethical principles and commit to professional ethics and responsibilities and norms of the Engineering practice.

Project Management and Finance:

An Engineer must demonstrate knowledge and understanding of the engineering and management principles and apply these to Engineering work environment, as a member and leader in a team, to manage projects and in multidisciplinary environments.

SRM UNIVERISTY DELHI-NCR, SONEPAT

FACULTY OF ENGINEERING AND TECHNOLOGY

ENGINEERING PROGRAM EDUCATIONAL OBJECTIVES (EPEOs):

1. Advancement to a professional position by virtue of their knowledge, skills and attitude.
2. Recognition for solving engineering problems and developing design solutions that consider safety and sustainability.
3. Work as successful professionals in diverse engineering disciplines and enterprises.
4. Increasing responsibilities of technical and managerial leadership in their work organizations.
5. Professional development through a commitment to career-long learning.

ENGINEERING PROGRAM LEARNING OUTCOMES (EPLOs):

1. An ability to identify, formulate, and solve real time engineering & socio-economic problems by applying principles of engineering, science, mathematics, humanities and social sciences.
2. An ability to use the advanced skill enhancement techniques and modern engineering tools as per industry 4.0 necessary for engineering practice.
3. An ability to apply engineering design to produce solutions that meet specified needs with realistic considerations of environmental, ethical, health & safety and sustainability.
4. An ability to adapt and work with multidisciplinary teams and communicate effectively.
5. An ability to function effectively on a team whose members together provide leadership, to create a collaborative environment, to establish goals and to execute plan tasks.
6. An understanding of professional and ethical responsibility.
7. An ability to acquire and apply new knowledge using appropriate learning strategies with inner quest to learn, unlearn and relearn.

MAPPING MATRIX OF ENGINEERING PROGRAM EDUCATIONAL OBJECTIVES AND ENGINEERING PROGRAM LEARNING OUTCOMES

ENGINEERING PROGRAM EDUCATIONAL OBJECTIVES	ENGINEERING PROGRAM LEARNING OUTCOMES
Advancement to a professional position by virtue of their knowledge, skills and attitude.	<ol style="list-style-type: none"> 1. An ability to identify, formulate, and solve real time engineering and socio-economic problems by applying principles of engineering, science, mathematics, humanities and social sciences. 2. An ability to use the advanced skill enhancement techniques and modern engineering tools as per industry 4.0 necessary for engineering practice.
Recognition for solving engineering problems and developing design solutions that consider safety and sustainability	<ol style="list-style-type: none"> 2. An ability to use the advanced skill enhancement techniques and modern engineering tools as per industry 4.0 necessary for engineering practice. 3. An ability to apply engineering design to produce solutions that meet specified needs with realistic considerations of environmental, ethical, health & safety and sustainability.
Work as successful professionals in diverse engineering disciplines	<ol style="list-style-type: none"> 3. An ability to apply engineering design to produce solutions that meet specified needs with realistic considerations of

	<p>environmental, ethical, health & safety and sustainability.</p> <p>4. An ability to adapt and work with multidisciplinary teams and communicate effectively.</p>
Increasing responsibilities of technical and managerial leadership in their work organizations;	<p>4. An ability to adapt and work with multidisciplinary teams and communicate effectively.</p> <p>5. An ability to function effectively on a team whose members together provide leadership, to create a collaborative environment, to establish goals and to execute plan tasks.</p> <p>6. An understanding of professional and ethical responsibility.</p>
Professional development through a commitment to career-long learning.	<p>6. An understanding of professional and ethical responsibility.</p> <p>7. An ability to acquire and apply new knowledge using appropriate learning strategies with inner quest to learn, unlearn and relearn.</p>

**TABLE 1: MAPPING MATRIX OF ENGINEERING PROGRAM EDUCATIONAL OBJECTIVES AND
ENGINEERING PROGRAM LEARNING OUTCOMES (TABULAR FORMAT)**

MAPPING MATRIX	EPLO1	EPLO2	EPLO3	EPLO4	EPLO5	EPLO6	EPLO7
EPEO1	X	X					
EPEO2		X	X				
EPEO3			X	X			
EPEO4				X	X	X	
EPEO5						X	X

**SRM UNIVERSITY, DELHI-NCR, SONEPAT
CIVIL ENGINEERING DEPARTMENT**

CIVIL ENGINEERING GRADUATE EMPLOYABILITY ATTRIBUTES (CEGEAS):

The B. Tech program aims at providing a strong foundation in theoretical, practical and design aspects of Civil Engineering (CE). The UG program is embraced by rigor and span to prepare a practicing engineer for a lifetime of creative work and ongoing technical learning. The curriculum covers all aspects of Civil engineering. The syllabus comprises of theory and laboratory courses. The theory course can be either a professional core (major) or professional elective course (minor). There are various specialized identified domains on emerging areas on which minor specializations are offered by the department. Each theory course has a laboratory component, which provides a balanced mix of quality teaching of theoretical concepts and experimental verification of the learnt concepts. Employability Attributes of a Civil Engineering Graduates will help them to attain competencies or abilities required to gain success in labor market at all the employment level. The following Engineering Program Employability Attributes are required in a Civil Engineer:

Sound Knowledge and Skill	A Civil Engineer should be able to apply the sound knowledge and skills of basic science and engineering science and engineering specialization to the solution of complex civil engineering problems.
Problem Analysis	A Civil Engineer should be able to identify, formulate, analyze and solve complex civil engineering problems using principles of mathematics, natural sciences, and engineering sciences.
Design and Development of Solution	A Civil Engineer must be able to propose solutions for complex civil engineering problems and design components to meet the specified needs for the public health and safety, and the cultural, societal, and environmental considerations.
Investigation	A Civil Engineer should use research-based knowledge and methods including design of experiments, analysis and interpretation of data, and synthesis of the information validate conclusions.

Modern Tools Usage	A Civil Engineer should be able to use modern engineering and IT tools for modeling, designing and analyzing civil structures.
The Engineer and the Society	A Civil Engineer should be able to assess various issues while abiding professional civil engineering codes.
Environment and Sustainability	A Civil Engineer must apply knowledge to provide engineering solutions for sustainable development of construction materials and structures within the societal and environmental context.
Ethics	A Civil Engineer should be able to apply principles and professional ethics and follow civil engineering practice norms laid by the various governing bodies.
Effective Communication	A Civil Engineer should be able to communicate effectively, comprehend and write effective reports for the engineering community and society.
Project Management and Finance	A Civil Engineer must understand the engineering and management principles and apply them to manage projects and in multidisciplinary environments.
Lifelong Learning	A Civil Engineer should be able to engage in independent and life-long learning.

Department of Civil Engineering

PROGRAM EDUCATIONAL OBJECTIVES(PEOs)

The Program Educational Objectives (PEOs) for the Department of Civil Engineering are to prepare our students to:

PEO1. Actively engage in problem solving using engineering principles to address the evolving needs of the society.

PEO2. Be able to investigate, analyze, design and develop Civil Engineering materials solutions and structures.

PEO3. Demonstrate a commitment to service to the profession and society.

PEO4. Be able to succeed in positions in Civil Engineering practice or research or entrepreneurship.

PEO5. Acquire competence of adapting to the ever changing technologies and new developments.

PEO6. Professional development through a commitment to career-long learning.

PROGRAM LEARNING OUTCOMES (PLOs)

The curriculum and syllabus for B. Tech. (Civil Engineering) programs conform to outcome based on C-D-I-O Initiative. The framework provides students with an education stressing engineering fundamentals set in the context of Conceiving — Designing — Implementing — Operating (CDIO) real-world systems and products.

In general, the curriculum and syllabus have been structured in such a way that each of the courses meets one or more of these under-mentioned outcomes. Student outcomes describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge, and behaviors that students acquire as they progress through the program. Further each course in the program spells out clear educational objectives which are mapped to the student outcomes.

Civil Engineering Graduates will be able to:

PLO1 Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to

the solution of complex engineering problems.

PLO2 Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PLO3 Design/ Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PLO4 Conduct Investigations of Complex Civil Engineering Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions for complex problems.

PLO5 Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PLO6 The Engineer and the Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PLO7 Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PLO8 Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PLO9 Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PLO10 Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and

receive clear instructions.

PLO11 Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PLO12 Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change

**TABLE 2: MAPPING MATRIX OF PROGRAM
EDUCATIONAL OBJECTIVES (PEOs) AND PROGRAM
LEARNING OUTCOMES(PLOs)**

	Program Learning Outcomes (PLOs)											
Program	PLO	PLO	PLO	PLO	PLO	PLO	PLO	PLO	PLO	PLO	PLO	PL O
Educational Objectives (PEOs)	1	2	3	4	5	6	7	8	9	10	11	12
PEO1	x	x	x	x	x	x			x	x		
PEO2	x	x	x	x	x	x				x	x	x
PEO3	x	x	x	x	x	x	x	x				
PEO4	x			x	x				x	x	x	
PEO5	x	x	x	x	x	x	x	x				
PEO6		x	x	x	x		x	x	x	x		

B. TECH (CIVIL ENGINEERING) PROGRAMME STRUCTURE

The curriculum for Bachelor of Technology in Civil Engineering is tailor-made so that the graduate must have a strong foundation in the discipline and in-depth knowledge of the tools used to tackle both, conventional and new challenging problems. In order to earn a B.Tech. degree in Civil Engineering, a student should must earn a minimum of 180 credits in the course of their study. The credit requirements for their program of study is comprised of the following Programme Structure:

- **Basic Applied Sciences (BAS) and Engineering Science (ES):**

The purpose of Basic Applied Sciences in Engineering study is to lay a strong foundation of basic principles of various disciplines such as Mathematics, Physics, Chemistry in the mind of the learners, so that they proceed to rest of their years of study with up to date knowledge and training of basic engineering skills. The Engineering Sciences requirements support multiple objectives: first, the courses provide a strong foundation in the basic tools and methodologies common to all engineering disciplines; second, all students are exposed to basics of each discipline allowing for cross-disciplinary competencies; last, there is a multi-disciplinary project component where students from different engineering disciplines come together on a design project, allowing for practice in collaborative team work.

- **Professional Core Courses (PC):** The Professional core courses are aimed at providing the student with a solid foundation in their chosen field of study as per Industry 4.0 skills and knowledge.

- **Practical (P):**

The labs are fully furnished and well equipped with latest software's to conduct practical as per the requirement of the University Curriculum.

- **Professional Electives (PE) – Programme specific Specialization Electives:**

The Professional electives, on the other hand, provide the student with an option to gain exposure to different specializations within the discipline, or an opportunity to study one of the subfields in some depth.

- **Ability Enhancement Courses (AEC)**

Students are required to achieve competency in a Modern Indian Language (MIL) along with English language with special emphasis on language and communication skills. The courses aim at enabling the students to acquire and demonstrate the core linguistic skills, including

critical reading and academic writing skills. The focus is on imparting students with necessary skills to articulate their arguments and present their thoughts clearly and coherently and recognize the importance of language as a mediator of knowledge and identity.

- **Skill Enhancement Courses (SEC) – Technical & Soft Skills:**

- **Technical Skills:** Under Technical Skills Broad categories of training to be imparted in Engineering Graduates of various disciplines with common nomenclature. The training is categorized into three categories: Elementary, Intermediate & Advanced keeping in view interdisciplinary approach. (One Credit Each from 3rd semester to 7th semester)
- **Soft Skills:** Under Soft skills training six soft skill courses with defined Nomenclature and course content common to all Engineering disciplines introduced to inculcate Group Dynamics, Team work & Leadership Traits by engaging students for interactive sessions through Role Play, Group Discussions and for improving presentation & Communication skills of engineering graduates. (One Credit Course from 2nd Semester to 7th semester).

- **Value Added Courses (VAC):**

Course components relating to skills, attitudes, and values required to take appropriate actions for mitigating the effects of environmental degradation, climate change, and pollution, effective waste management, conservation of biological diversity, management of biological resources, forest and wildlife conservation, and sustainable development and living health and wellness seek to promote an optimal state of physical, emotional, intellectual, social, spiritual, and environmental well-being of a person, the constitutional obligations with special emphasis on constitutional values and fundamental rights and duties

- **Live Projects (LP) & Industrial Visits (IV) and Summer Internship (SI):**

- **Live Projects& Industrial Visits:**

- ❖ Live Projects is being introduced for all Engineering disciplines from 3rd semester onwards till 6th Semester to develop an ability in engineering graduates to apply skills and knowledge attained to solve real life complex problems (One Credit each semester).
- ❖ Apart from this, it will be mandatory to conduct at least 2 Industrial Visits each semester to provide students a proper industrial exposure.

- **Summer Internship (SI):**

- ❖ Student will be monitored on periodic basis, both by the Faculty Mentor from the Industry and the Faculty In-charge from the department. The Faculty Mentor from the Industry will submit the Mid-Term and End-Term Evaluation report. However, the faculty In-charge from the department will take periodic presentation to keep a check on the progress of Student.
- ❖ Students are provided with the internship related document which helps them to prepare, report. In addition to this, it provides a detail to students about internship/project evaluation parameters.

- **Multidisciplinary (Humanities and Social Sciences Courses) Courses (MDC)**

The open elective subject courses provide the student with wide latitude to pursue their interests, be it in humanities, management, arts or their own chosen field of study in order to have multidisciplinary approach.

**TABLE 3: PROGRAM STRUCTURE FOR BACHELOR OF
TECHNOLOGY (CIVIL ENGINEERING) DEGREE COURSE**

SL. No.	Course Category	Course Code	Number of Courses
1	Basic Applied Sciences	BAS	7
2	Engineering Sciences	ES	10
3	Professional Core	PC	14
4	Professional Electives -Program Specific Specialized Elective Courses	PE	11
5	Ability Enhancement Courses	AEC	2
6	Skill Enhancement courses (Technical and Soft skills)	SEC	10
7	Value Added Courses	VAC	3
8	Practical / Workshop	P/W	10
9	Live Project & Industrial Visit and Summer Internship	LP/SI	6
10	Multidisciplinary (Humanities and Social Sciences Courses) Courses	MDC	3
TOTAL NUMBER OF COURSES			76

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TABLE 4: PROGRAM CREDIT STRUCTURE SEMESTER WISE FOR BACHELOR OF TECHNOLOGY (CIVIL ENGINEERING) DEGREE COURSE

SL. No	Course Category	Course Code	Credits Per Semester								Total Credits	% AGE
			I	II	III	IV	V	VI	VII	VIII		
1	Basic Applied Sciences	BAS	9	9	-	4	-	-	-	-	22	12
2	Engineering Sciences	ES	9	9	-	-	-	-	-	-	18	10
3	Professional Core	PC	-	-	12	9	12	7	6	-	46	26
4	Professional Electives -Program Specific Specialized Elective Courses	PE	-	-	3	3	6	12	9	-	33	18
5	Ability Enhancement Courses	AEC	3	3	-	-	-	-	-	-	6	3
6	Skill Enhancement courses (Technical and Soft skills)	SEC	-	-	2	2	2	2	2	-	10	6
7	Value Added Courses	VAC	2	2	2	-	-	-	-	-	6	3
8	Practical / Workshop	P/W	-	-	4	3	2	1	-	-	10	6
9	Live Project & Industrial Visit and Summer Internship	LP/SI	-	-	-	1	1	1	5	12	20	11
10	Multidisciplinary (Humanities and Social Sciences Courses) Courses	MDC	-	-	-	3	3	3	-	-	9	5
TOTAL			23	23	23	25	26	26	22	12	180	100

BACHELOR OF TECHNOLOGY (CIVIL ENGINEERING)
DEGREE COURSE
TABLE 5: PROGRAM COURSE'S CREDIT STRUCTURE
SEMESTER WISE

Semester-I

SL.No	Code	Category	Course Name	Hours per week				Credits
				L	T	P	Total Hours	
Theory								
1	23AS101	(BAS)	Engineering Mathematics-I	3	1	0	4	4
2	23AS102/23AS103	(BAS)	Engineering Physics/Engineering Chemistry	3	1	0	4	4
3	23EE101/23EC101	(ES)	Basic Electrical Engineering /Basic Electronics Engineering	3	0	0	3	3
4	23ME101/23CS101	(ES)	Engineering Mechanics / Fundamentals of Computer & C Programming	3	0	0	3	3
5	23AEC101/23AEC102	(AEC)	Professional English	2	0	0	2	2
			Hindi	3	0	0	3	3
6	23VAC101/23VAC102	(VAC)	Environment Protection, Sustainable Development & Living/ Indian Constitution and Polity	2	0	0	2	2
Total Credits (Theory)				16/17	2	0	18/19	18/19
Practical								
7	23AS152/23AS153	(BAS)	Engineering Physics Lab/Engineering Chemistry Lab	0	0	2	2	1
8	23EE151/23EC151	(ES)	Basic Electrical Engineering Lab /Basic Electronics Engineering Lab	0	0	2	2	1
9	23ME151/23CS151	(ES)	Basic Mechanical Engineering Lab/ C Programming Lab	0	0	2	2	1
10	23ME152/23ME153	(ES)	Mechanical Workshop Lab/Engineering Graphics & Design Lab	0	0	2	2	1
11	23AEC151*	(AEC)	Communication English Lab	0	0	2*	2*	1*
Total Credits (Practical)				0	0	10/8	10/8	5/4
	Total Credits (Theory + Practical)			16/17	2	10/8	28/27	23

[L= Lecture, T = Tutorials, P = Practical's & C = Credits]

***3 Week long Induction Programme right at the start of the 1st Semester. Normal class start only after the induction programme is over.**

Semester-II

SL.No	Code	Category	Course Name	Hours per week				Credits
				L	T	P	Total Hour s	
Theory								
1	23AS0201	(BAS)	Engineering Mathematics-II	3	1	0	4	4
2	23AS0202/2 3AS0203	(BAS)	Engineering Physics/Engineering Chemistry	3	1	0	4	4
3	23EE0201/2 3EC0201	(ES)	Basic Electrical Engineering /Basic Electronics Engineering	3	0	0	3	3
4	23ME0201/2 3CS0201	(ES)	Engineering mechanics / Fundamentals of Computer & C Programming	3	0	0	3	3
5	23AEC0201	(AEC)	Professional English	2	0	0	2	2
	23AEC 202		Hindi	3	0	0	3	3
6	23VAC201/2 3VAC 202	(VAC)	Environment Protection, Sustainable Development & Living / Indian Constitution and Polity	2	0	0	2	2
Total Credits (Theory)				16/17	2	0	18/19	18/19
Practical								
7	23AS0252/23 AS0253	(BAS)	Engineering Physics Lab/Engineering Chemistry Lab	0	0	2	2	1
8	23EE0251/2 3EC0251	(ES)	Basic Electrical Engineering Lab /Basic Electronics Engineering Lab	0	0	2	2	1
9	23ME251/23 CS251	(ES)	Basic Mechanical Engineering Lab/ C Programming Language Lab	0	0	2	2	1
10	23ME0251/2 1ME0252	(ES)	Mechanical Workshop Lab/Engineering Graphics & Design Lab	0	0	2	2	1
11	23AEC151*	(AEC)	Communication English Lab	0	0	2*	2*	1*
Total Credits (Practical)				0	0	10/8	10/8	5/4
Total Credits (Theory + Practical)				16/ 17	2	10/8	28/27	23

[L= Lecture, T = Tutorials, P = Practical's & C = Credits]

Semester-III

SL.No	Code	Category	Course	Hours per week				Credits
				L	T	P	Total Hours	
Theory								
1	23CE301	(PC)	Structural Analysis – I	3	0	0	3	3
2	23CE302	(PC)	Surveying - I	3	0	0	3	3
3	23CE303	(PC)	Fluid Mechanics	3	0	0	3	3
4	23CE304	(PC)	Environmental Engineering	3	0	0	3	3
5	*23CEPE XX	(PE)	Professional Elective-I	3	0	0	3	3
Total Credits (Theory)				15	0	0	15	15
Practical								
6	23CE351	(P)	Structural Analysis Lab	0	0	2	2	1
7	23CE352	(P)	Surveying – I Lab	0	0	2	2	1
8	23CE353	(P)	Fluid Mechanics Lab	0	0	2	2	1
9	23CE354	(P)	Environmental Engineering Lab	0	0	2	2	1
10	23VAC301	(VAC)	Sports, Yoga and Fitness	1	0	2	3	2
Total Credits (Practical)				1	0	10	11	6
Skill Enhancement								
11	23CS0201	(SEC)	Essentials of Blockchain and Internet of Things	0	0	2	2	1
12	23SS351	(SEC)	Effective Communication Skills	0	0	2	2	1
Total Credits (Skill Enhancement)				0	0	4	4	2
Total Credits (Theory + Practical + Skill Enhancement)				16	0	14	30	23

[L= Lecture, T = Tutorials, P = Practical's & C = Credits]

Semester-IV

SL.No	Code	Category	Course	Hours per week				Credits
				L	T	P	Total Hours	
Theory								
1	23MDC401	(MDC)	Multidisciplinary Elective-I	3	0	0	3	3
2	23AS401	(BAS)	Numerical Methods	3	1	0	4	4
3	23CE401	(PC)	Advanced Surveying	3	0	0	3	3
4	23CE402	(PC)	Soil Mechanics	3	0	0	3	3
5	23CE403	(PC)	Design of Steel Structure	3	0	0	3	3
6	*23CEPEXX	(PE)	Professional Elective - II	3	0	0	3	3
Total Credits (Theory)				18	1	0	19	19
Practical								
7	23CE451	(P)	Surveying – II Lab	0	0	2	2	1
8	23CE452	(P)	Soil Mechanics Lab	0	0	2	2	1
9	23CE453	(P)	Computer Aided Drawing – I	0	0	2	2	1
10	23CE454	(LP/SI)	Live Project – I (Steel Structures)## & Industrial Visits	0	0	1	1	1
Total Credits (Practical)				0	0	7	7	4
Skill Enhancement								
11	23SS452	(SEC)	Teamwork & Interpersonal Skills	0	0	2	2	1
12	23CS0202	(SEC)	Artificial Intelligence and Machine Learning	0	0	2	2	1
	Total Credits (Skill Enhancement)			0	0	4	4	2
Total Credits (Theory + Practical + Skill Enhancement)				18	1	11	30	25

[L= Lecture, T = Tutorials, P = Practical's & C = Credits]

##To be carried out after 3rd Semester during semester break. Evaluation to be carried out in 4th Semester

Semester – V

SL.No	Code	Category	Course Name	Hours per week				Credits
				L	T	P	Total Hours	
Theory								
1	23MDC501	(MDC)	Multidisciplinary Elective-II	3	0	0	3	3
2	23CE501	(PC)	Foundation Engineering	3	1	0	4	4
3	23CE502	(PC)	Design Of Reinforced Concrete Structure	3	1	0	4	4
4	23CE503	(PC)	Transportation Engineering	3	1	0	4	4
5	*23CEPEX X	(PE)	Professional Elective - III	3	0	0	3	3
6	*23CEPEX X	(PE)	Professional Elective - IV	3	0	0	3	3
Total Credits (Theory)				18	3	0	21	21
Practical								
7	23CE551	(P)	Foundation Engineering Lab	0	0	2	2	1
8	23CE552	(P)	Transportation Engineering –Lab	0	0	2	2	1
9	23CE553	(LP/SI)	Live Project– II (Survey Camp)## & Industrial Visits	0	0	1	1	1
Total Credits (Practical)				0	0	5	5	3
Skill Enhancement								
10	23SS553	(SEC)	Presentation & Speaking Skills	0	0	2	2	1
11	23CS0301	(SEC)	Design Thinking and Augmented VirtualReality/	0	0	2	2	1
Total Credits (Skill Enhancement)				0	0	4	4	2
Total Credits (Theory + Practical + Skill Enhancement)				18	3	9	30	26

[L= Lecture, T = Tutorials, P = Practical's & C = Credits]

***The XX part of the course code will depend upon the elective chosen by the student.**
##To be carried out after 4th semester during semester break. Evaluation to be carried out in 5th Semester.

Semester – VI

SL.No	Code	Category	Course	Hours per week				Credits
				L	T	P	Total Hours	
Theory								
1	23MDC601	(MDC)	Multidisciplinary Elective-III	3	0	0	3	3
2	23CE601	(PC)	Construction Management	3	0	0	3	3
3	23CE602	(PC)	Structure Analysis – II	3	1	0	4	4
4	*23CEPEXX	(PE)	Professional Elective-V	3	0	0	3	3
5	*23CEPEXX	(PE)	Professional Elective-VI	3	0	0	3	3
6	*23CEPEXX	(PE)	Professional Elective-VII	3	0	0	3	3
7	*23CEPEXX	(PE)	Professional Elective-VIII	3	0	0	3	3
Total Credits (Theory)				21	1	0	22	22
Practical								
8	21CE651	(P)	Material Testing Lab	0	0	2	2	1
9	23CE652	(LP/SI)	Live Project– III (RCC Structures) ^{##} & Industrial Visits	0	0	1	1	1
Total Credits (Practical)				0	0	3	3	2
Skill Enhancement								
10	23SS655	(SEC)	Professional Writing Skills	0	0	2	2	1
11	23CS0302	(SEC)	Big Data Analytics, Tools and Techniques	0	0	2	2	1
Total Credits (Skill Enhancement)				0	0	4	4	2
Total Credits (Theory + Practical + Skill Enhancement)				21	1	7	29	26

[L= Lecture, T = Tutorials, P = Practical's & C = Credits]

***The XX part of the course code will depend upon the elective chosen by the student**
##To be carried out after 5th semester during semester break. Evaluation to be carried out in 6th Semester.

Semester – VII

SL.No	Code	Category	Course	Hours per week				Credits
				L	T	P	Total Hours	
Theory								
1	*23CEPEXX	(PE)	Professional Elective -IX	3	0	0	3	3
2	*23CEPEXX	(PE)	Professional Elective -X	3	0	0	3	3
3	*23CEPEXX	(PE)	Professional Elective -XI	3	0	0	3	3
4	23CE701	(PC)	Estimation and Costing	3	0	0	3	3
5	23CE702	(PC)	Irrigation Engineering	3	0	0	3	3
Total Credits (Theory)				15	0	0	15	15
Practical								
6	21CE751	(LP/SI)	**Minor Project	0	0	8(4) **	4	4
7	21CE752	(LP/SI)	Live Project– IV (Highways)## & Industrial Visits	0	0	1	1	1
Total Credits (Practical)				0	0	5	5	5
Skill Enhancement								
8	23SS756	(SEC)	Interpersonal Skills: Strategies	0	0	2	2	1
9	23CS0401	(SEC)	Data Structure and Algorithms using C++	0	0	2	2	1
Total Credits (Skill Enhancement)				0	0	4	4	2
Total Credits (Theory + Practical + Skill Enhancement)				15	0	9	24	22

[L= Lecture, T = Tutorials, P = Practical's & C = Credits]

***The XX parts of the course code will depend upon the elective chosen by the student.**

****To be monitored at the Institute Level. Teaching Load for ERP**

#To be carried out after 6th semester during semester break. Evaluation to be carried out in 7th Semester.

Semester – VIII

SL.No	Code	Category	Course	Hours per week				Credits
				L	T	P	Total Hours	
Practical								
1	23CE851	(LP/SI)	*Major Project (Industrial Internship)	0	0	24	24(6) **	12
Total Credits (Practical)				0	0	24	24(6) **	12

* To Be Monitored at The Institute Level

** Teaching Load

Department Elective Courses in Degree of Civil Engineering

Code	Category	Course	L	T	P	C
23CEPE01	(PE)	Structural Dynamics	3	0	0	3
23CEPE02	(PE)	Introduction to Finite Element Method	3	0	0	3
23CEPE03	(PE)	Air and Noise Pollution and Control	3	0	0	3
23CEPE04	(PE)	Hydrology	3	0	0	3
23CEPE05	(PE)	Advanced Concrete Technology	3	0	0	3
23CEPE06	(PE)	Open Channel Hydraulics	3	0	0	3
23CEPE07	(PE)	Railway and Airport Engineering	3	0	0	3
23CEPE08	(PE)	Design of Wastewater Treatment Processes	3	0	0	3
23CEPE09	(PE)	Building Construction Materials	3	0	0	3
23CEPE10	(PE)	Disaster Management	3	0	0	3
23CEPE11	(PE)	Earthquake Analysis and Design	3	0	0	3
23CEPE12	(PE)	Bridge Engineering	3	0	0	3
23CEPE13	(PE)	Design of Concrete Structures – II	3	0	0	3
23CEPE14	(PE)	Prestressed Concrete Structures	3	0	0	3
23CEPE15	(PE)	Solid Waste Management and Landfills	3	0	0	3
23CEPE16	(PE)	Ground Improvement Techniques	3	0	0	3
23CEPE17	(PE)	Geotechnical Engineering	3	0	0	3
23CEPE18	(PE)	Rock Mechanics	3	0	0	3
23CEPE19	(PE)	Geosynthetics and Its Application	3	0	0	3

Department Elective Courses of Specialization in Degree of Civil Engineering

1. Specialization in Structural Engineering

Code	Category	Course	L	T	P	C
23CEPE01	(PE)	Structural Dynamics	3	0	0	3
23CEPE02	(PE)	Introduction To Finite Element Method	3	0	0	3
23CEPE05	(PE)	Advanced Concrete Technology	3	0	0	3
23CEPE09	(PE)	Building Construction Materials	3	0	0	3
23CEPE10	(PE)	Disaster Management	3	0	0	3
23CEPE11	(PE)	Earthquake Analysis and Design	3	0	0	3
23CEPE12	(PE)	Bridge Engineering	3	0	0	3
23CEPE13	(PE)	Design of Concrete Structures – II	3	0	0	3
23CEPE14	(PE)	Prestressed Concrete Structures	3	0	0	3
23CEPE16	(PE)	Ground Improvement Techniques	3	0	0	3
23CEPE19	(PE)	Geosynthetics and Its Application	3	0	0	3
23CEPE20	(PE)	Structural Analysis – III	3	0	0	3
23CEPE21	(PE)	Temporary Structures	3	0	0	3
23CEPE22	(PE)	Maintenance and Repair of Structures	3	0	0	3
23CEPE23	(PE)	Health Monitoring of Structures	3	0	0	3
23CEPE24	(PE)	Design and Detailing of Structures	3	0	0	3
23CEPE25	(PE)	Design of Masonry Structures	3	0	0	3

2. Specialization in Environmental Engineering

Code	Category	Course	L	T	P	C
23CEPE03	(PE)	Air and Noise Pollution and Control	3	0	0	3
23CEPE08	(PE)	Design of Wastewater Treatment Processes	3	0	0	3
23CEPE15	(PE)	Solid Waste Management and Landfills	3	0	0	3
23CEPE26	(PE)	Sustainable engineering & technology	3	0	0	3
23CEPE27	(PE)	Environmental impact assessment and life cycle analyses	3	0	0	3
23CEPE28	(PE)	River engineering	3	0	0	3
23CEPE29	(PE)	Urban water hydrology and hydraulics	3	0	0	3
23CEPE30	(PE)	Environmental Ethics and Legislation	3	0	0	3
23CEPE31	(PE)	Advance Wastewater Treatment	3	0	0	3
23CEPE32	(PE)	Environmental Planning and Management	3	0	0	3
23CEPE33	(PE)	Hazardous Waste Management	3	0	0	3

23CEPE34	(PE)	Industrial Waste Management	3	0	0	3
23CEPE35	(PE)	Ground Water Engineering	3	0	0	3

Ability Enhancement Courses

Code	Category	Course	L	T	P	C
23AEC101	(AEC)	Professional English	2	0	2	3
23AEC301	(AEC)	Hindi	3	0	0	3

List of Skill Enhancement Courses

SubjectCode	Course	Category	L	T	P	Credits
Technical Training						
23CS0201	Essentials of Blockchain and IoT	SEC	0	0	2	1
23CS0202	Artificial Intelligence and Machine Learning	SEC	0	0	2	1
23CS0301	Design Thinking and Augmented Virtual Reality - Level	SEC	0	0	2	1
23CS0302	Big Data Analytics, Tools and Techniques	SEC	0	0	2	1
23CS0401	Data Structure and Algorithms using C++	SEC	0	0	2	1
Soft Skill						
23SS251	Effective Communication Skills	SEC	0	0	2	1
23SS351	Teamwork & Interpersonal Skills	SEC	0	0	2	1
23SS451	Presentation & Speaking Skills	SEC	0	0	2	1
23SS551A	Professional Writing Skills	SEC	0	0	2	1
23SS651A	Interpersonal Skills : Strategies	SEC	0	0	2	1

Value Added Courses

Code	Category	Course	L	T	P	C
23VACXX	(VAC)	Indian Constitution and Polity	3	0	0	3
23VACXX	(VAC)	Environment Protection, Sustainable Development & Living	3	0	0	3
23VACXX	(VAC)	Sports, Yoga and Fitness	2	0	2	3

Humanities & Social Sciences including Management Courses (Multi-Disciplinary Courses)

Code	Category	Course	L	T	P	C
23MDCXX / 23MDCXX / 23MDCXX	(MDC-I)	Principles of Management & Organization Behavior Fundamentals of Finance & Accounting Financial Institution and Banking System in India	3	0	0	3
23MDCXX	(MDC-II)	Library Information Science and Media Literacy	3	0	0	3
23MDCXX	(MDC-III)	Intellectual Property Rights in Business	3	0	0	3
		Indian Economy	3	0	0	3
		Psychology and Life	3	0	0	3
		Foundations of Political Science	3	0	0	3
		Basics of Sociology and Human Behavior	3	0	0	3