

**SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE**  
**(Autonomous)**  
**Gobichettipalayam, Erode-638455**



**Regulation 2023 (Autonomous)**  
**Curriculum and Syllabus**  
**Choice Based Credit System (CBCS)**  
**BE – CIVIL ENGINEERING**



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**Regulation 2023 (UG)**  
**Curriculum and Syllabus**  
**BE-Civil Engineering**

## I. Program Educational Objective (PEO)

- PEO1: Successful Careers :** Gain knowledge and skills in Civil engineering which will enable them to have a career and professional accomplishment in the public or private sector organizations
- PEO2: Complex Problem Solving:** Become consultants on complex real life Civil Engineering problems related to Infrastructure development especially housing, construction, water supply, sewerage, transport, spatial planning.
- PEO3: Technical Solutions:** Become entrepreneurs and develop processes and technologies to meet desired infrastructure needs of society and formulate solutions that are technically sound, Economically feasible, and socially acceptable.
- PEO4: Research Investigation:** Perform investigation for solving Civil Engineering problems by conducting research using modern equipment and software tools.
- PEO5: Multi-disciplinary Function:** Function in multi-disciplinary teams and advocate policies, systems, processes and equipment to support civil engineering

## II. Program Outcomes (POs)

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **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.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **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.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **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.
11. **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.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### III. Program Specific Outcomes (PSOs)

**PSO1: Knowledge of Civil Engineering discipline**

Demonstrate in-depth knowledge of Civil Engineering discipline, with an ability to evaluate, analyze and synthesize existing and new knowledge.

**PSO2: Critical analysis of Civil Engineering problems and innovation**

Critically analyze complex Civil Engineering problems, apply independent judgment for synthesizing information and make innovative advances in a theoretical, practical and policy context.

**PSO3: Conceptualization and evaluation of engineering solutions to Civil Engineering**

Issues Conceptualize and solve Civil Engineering problems, evaluate potential solutions and arrive at technically feasible, economically viable and environmentally sound solutions with due consideration of health, safety, and socio cultural factors.

**Mapping of Course Outcome and Programme Outcome**

Year	Sem	Course name	PO												PSO			
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
I	I	Professional English - I	-	-	-	2	-	1	-	-	2	3	-	3	-	-	-	
		Matrices and Calculus	3	3	1	1	-	-	-	-	2	-	2	3	-	-	-	
		Engineering Physics	3	3	2	1	2	-	-	-	-	-	-	1	-	-	-	
		Engineering Chemistry	3	2	2	1	1	2	3	-	-	-	-	1	-	-	-	
		Problem Solving and Python Programming	2	3	3	3	2	-	-	-	-	-	2	2	3	3	3	
		தமிழர் மரபு /Heritage of Tamils	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Problem Solving and Python Programming Laboratory	2	3	3	3	2	-	-	-	-	-	2	2	3	3	3	
		Physics and Chemistry Laboratory	3	3	1	1	-	-	-	-	-	-	-	-	-	-	-	-
		English Laboratory	3	2	1	-	1	3	2	1	-	-	-	1	-	-	-	
	II	Professional English - II	-	1	1	-	-	-	1	1	2	3	-	2	-	-	-	
		Numerical Methods and Statistics	3	3	1	1	1	-	-	-	2	-	2	3	-	-	-	
		Materials Science	3	2	2	1	2	2	2	-	-	-	-	1	-	-	-	
		Basic Electrical and Electronics Engineering	3	3	2	2	-	-	-	-	-	1	-	-	-	-	-	
		Engineering Graphics	3	1	2	-	2	-	-	-	-	3	-	-	3	3	2	
		தமிழரும் தொழில்நுட்பமும் /Tamils and Technology	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		Engineering Practices Laboratory	3	2	-	-	1	1	1	-	-	-	-	2	-	-	-	
		Basic Electrical and Electronics Engineering Laboratory	1.6	1.4	0.8	1.6	-	-	-	1.2	1.6	-	-	-	-	-	-	
		Communication Laboratory	-	-	2	-	-	-	-	1	3	3	-	3	-	-	-	

1 - low, 2 - medium, 3 - high, '-' - no correlation

**SUMMARY OF CREDITS**

S. No	Course Category	Credits per Semester								Total Credits	Credits in %	Credits as per AU Curriculum	Credits as per AICTE Model Curriculum
		I	II	III	IV	V	VI	VII	VIII				
1	HSS	4	3	-	-	-	-	5	-	12	7.06	12	12
2	BS	12	7	4	2	-	-	-	-	25	14.71	25	26
3	ES	5	11	3	-	-	-	-	-	19	11.18	19	29
4	PC	-	-	16	21	11	11	6	-	65	38.24	65	47
5	PE	-	-	-	-	9	9	-	-	18	10.59	18	23
6	OE	-	-	-	-	-	3	9	-	12	7.06	12	11
7	EEC	1	2	1	-	1	-	4	10	19	11.18	15	12
8	MC		√		√	√	√						
<b>Total Credits / Semester</b>		<b>22</b>	<b>23</b>	<b>24</b>	<b>23</b>	<b>21</b>	<b>23</b>	<b>24</b>	<b>10</b>	<b>170</b>	<b>100</b>	<b>166</b>	<b>160</b>

**CATEGORIZATION OF COURSES**

- i. Humanities and Social Sciences including Management Courses (HSS)
- ii. Basic Science Courses (BS)
- iii. Engineering Science Courses (ES)
- iv. Professional Core Courses (PC)
- v. Professional Elective Courses (PE)
- vi. Open Elective Courses (OE)
- vii. Mandatory Courses (MC)
- viii. Employability Enhancement Courses (EEC)
- ix. Other Courses (OC)

**ENROLLMENT FOR B.E. / B. TECH. (HONOURS) / MINOR DEGREE (OPTIONAL)**

A student can also optionally register for additional courses (18 credits) and become eligible for the award of B.E. / B. Tech. (Honours) or Minor Degree.

For B.E. / B. Tech. (Honours), a student shall register for the additional courses (18 credits) from semester V onwards. These courses shall be from the same vertical or a combination of different verticals of the same programme of study only.

For minor degree, a student shall register for the additional courses (18 credits) from semester V onwards. All these courses have to be in a particular vertical from any one of the other programmes.



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Curriculum and Syllabus

BE-Civil Engineering

SEMESTER I

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
<b>Induction Program</b>											
1.	23IPA11	Induction Programme	-	-	-	-	-	0	-	-	-
<b>Theory</b>											
2.	23ENT11	Professional English - I	HSS	3	0	0	3	3	40	60	100
3.	23MAT11	Matrices and Calculus	BS	3	1	0	4	4	40	60	100
4.	23PHT11	Engineering Physics	BS	3	0	0	3	3	40	60	100
5.	23CYT11	Engineering Chemistry	BS	3	0	0	3	3	40	60	100
6.	23CST11	Problem Solving and Python Programming	ES	3	0	0	3	3	40	60	100
7.	23TAT11	தமிழர் மரபு /Heritage of Tamils	HSS	1	0	0	1	1	40	60	100
<b>Practicals</b>											
8.	23CSL11	Problem Solving and Python Programming Laboratory	ES	0	0	4	4	2	60	40	100
9.	23PCL11	Physics and Chemistry Laboratory	BS	0	0	4	4	2	60	40	100
10.	23ENL11	English Laboratory	EEC	0	0	2	2	1	60	40	100
<b>Total</b>				<b>16</b>	<b>1</b>	<b>10</b>	<b>27</b>	<b>22</b>			



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SEMESTER II

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
<b>Theory</b>											
1.	23ENT21	Professional English - II	HSS	2	0	0	2	2	40	60	100
2.	23MAT21	Numerical Methods and Statistics	BS	3	1	0	4	4	40	60	100
3.	23PHT22	Materials Science	BS	3	0	0	3	3	40	60	100
4.	23EET22	Basic Electrical and Electronics Engineering	ES	3	0	0	3	3	40	60	100
5.	23MET21	Engineering Graphics	ES	2	0	4	6	4	40	60	100
6.	23TAT21	தமிழரும் தொழில்நுட்பமும் /Tamil and Technology	HSS	1	0	0	1	1	40	60	100
<b>Practicals</b>											
7.	23MEL21	Engineering Practices Laboratory	ES	0	0	4	4	2	60	40	100
8.	23EEL22	Basic Electrical and Electronics Engineering Laboratory	ES	0	0	4	4	2	60	40	100
9.	23ENL21	Communication Laboratory	EEC	0	0	4	4	2	60	40	100
<b>Mandatory Courses</b>											
10.	23MCL21	Mandatory Course – I <sup>&amp;</sup>	MC	0	0	1	1	0	100	-	100
<b>Total</b>				<b>14</b>	<b>1</b>	<b>17</b>	<b>32</b>	<b>23</b>			

## & Mandatory Course-I

Yoga for Human Excellence	Non – Credit Course
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SEMESTER III

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
<b>Theory</b>											
1.	23MAT32	Transforms and Partial Differential Equations	BS	3	1	0	4	4	40	60	100
2.	23MET31	Engineering Mechanics	ES	3	0	0	3	3	40	60	100
3.	23CET31	Fluids Mechanics	PC	3	0	0	3	3	40	60	100
4.	23CET32	Construction Materials and Technology	PC	3	0	0	3	3	40	60	100
5.	23CET33	Water Supply and Wastewater Engineering	PC	4	0	0	4	4	40	60	100
6.	23CET34	Surveying and Levelling	PC	3	0	0	3	3	40	60	100
<b>Practicals</b>											
7.	23CEL31	Surveying and Levelling Laboratory	PC	0	0	3	3	1.5	60	40	100
8.	23CEL32	Water and Wastewater Analysis Laboratory	PC	0	0	3	3	1.5	60	40	100
9.	23PDL31	Professional Development	EEC	0	0	2	2	1	100	-	100
<b>Total</b>				<b>19</b>	<b>1</b>	<b>8</b>	<b>28</b>	<b>24</b>			





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### SEMESTER IV

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
<b>Theory</b>											
1.	23CET41	Applied Hydraulics Engineering	PC	3	1	0	4	4	40	60	100
2.	23CET42	Strength of Materials	PC	3	0	0	3	3	40	60	100
3.	23CET43	Concrete Technology	PC	3	0	0	3	3	40	60	100
4.	23CET44	Soil Mechanics	PC	3	0	0	3	3	40	60	100
5.	23CET45	Highway and Railway Engineering	PC	3	0	0	3	3	40	60	100
6.	23CYT41	Environmental Sciences and Sustainability	BS	2	0	0	2	2	40	60	100
<b>Practicals</b>											
7.	23CEL41	Hydraulic Engineering Laboratory	PC	0	0	3	3	1.5	60	40	100
8.	23CEL42	Materials Testing Laboratory	PC	0	0	4	4	2	60	40	100
9.	23CEL43	Soil Mechanics Laboratory	PC	0	0	3	3	1.5	60	40	100
<b>Mandatory Courses</b>											
10.	23SAT41	Soft and Analytical Skills – I&	MC	1	0	0	1	0	-	-	-
<b>Total</b>				<b>18</b>	<b>1</b>	<b>11</b>	<b>29</b>	<b>23</b>			

& Soft and Analytical Skills – I is a Non-credit Course



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SEMESTER V

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
<b>Theory</b>											
1.	23CET51	Basic Structural Design - I (Concrete)	PC	3	0	0	3	3	40	60	100
2.	23CET52	Structural Analysis I	PC	3	0	0	3	3	40	60	100
3.	23CET53	Foundation Engineering	PC	3	0	0	3	3	40	60	100
4.		Professional Elective I *	PE	-	-	-	-	3	-	-	100
5.		Professional Elective II *	PE	-	-	-	-	3	-	-	100
6.		Professional Elective III *	PE	-	-	-	-	3	-	-	100
<b>Practicals</b>											
7.	23CEL51	Highway Engineering Laboratory	PC	0	0	4	4	2	60	40	100
8.	23CEL52	Survey Camp	EEC	0	0	0	0	1	60	40	100
<b>Mandatory Courses</b>											
9.		Mandatory Course - II&	MC	3	0	0	3	0	100	-	100
10.	23SAT51	Soft and Analytical Skills - II&&	MC	1	0	0	1	0	-	-	-
<b>Total</b>				-	-	-	-	<b>21</b>			

\* Professional Elective - I to III shall be chosen from the list of Professional electives (Verticals) offered by same Programme

& Mandatory Course-II is a Non-credit Course (Student shall select one course from the list given under Mandatory Course-II)

&& Soft and Analytical Skills - II is a Non-credit Course



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SEMESTER VI

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
<b>Theory</b>											
1.	23CET61	Basic Structural Design – II (Steel)	PC	3	0	0	3	3	40	60	100
2.	23CET62	Structural Analysis II	PC	3	0	0	3	3	40	60	100
3.	23CET63	Engineering Geology	PC	3	0	0	3	3	40	60	100
4.		Professional Elective IV *	PE	-	-	-	-	3	-	-	100
5.		Professional Elective V *	PE	-	-	-	-	3	-	-	100
6.		Professional Elective VI *	PE	-	-	-	-	3	-	-	100
7.		Open Elective – I**	OE	-	-	-	-	3	-	-	100
<b>Practicals</b>											
8.	23CEL61	Building Drawing and Detailing Laboratory	PC	0	0	4	4	2	60	40	100
<b>Mandatory Courses</b>											
9.		Mandatory Course – III&	MC	3	0	0	3	0	100	-	100
<b>Total</b>				-	-	-	-	<b>23</b>			

\* Professional Elective – IV to VI shall be chosen from the list of Professional electives (Verticals) offered by same Programme

\*\* Open Elective – I shall be chosen from the list of open electives offered by other Programmes

& Mandatory Course-III is a Non-credit Course (Student shall select one course from the list given under Mandatory Course-III)

@ The students individually undergo training in reputed firms/ Research institutes / laboratories for the specified duration (04 Weeks) during VI semester summer vacation. After completion of training, a detailed report should be submitted within ten days from the commencement of VII semester.



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## Regulation 2023 (UG) Curriculum and Syllabus BE-Civil Engineering

### SEMESTER VII

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
<b>Theory</b>											
1.	23CET71	Estimation, Costing and Valuation Engineering	PC	3	0	0	3	3	40	60	100
2.	23CET72	Hydrology and Water Resources Engineering	PC	3	0	0	3	3	40	60	100
3.	23UHV71	Human Values and Ethics	HSS	2	0	0	2	2	40	60	100
4.		Elective – Management#	HSS	3	0	0	3	3	40	60	100
5.		Open Elective – II**	OE	-	-	-	-	3	40	60	100
6.		Open Elective – III**	OE	-	-	-	-	3	40	60	100
7.		Open Elective – IV**	OE	-	-	-	-	3	40	60	100
<b>Practicals</b>											
8.	23CEL71	Design Project	EEC	0	0	4	4	2	40	60	100
9.	23CEL72	Summer Internship@	EEC	0	0	0	0	2	100	-	100
<b>Total</b>				-	-	-	-	<b>24</b>			

# Elective - Management shall be chosen from the list of Elective Management courses

\*\* Open Elective – II to IV shall be chosen from the list of open electives offered by other Programmes

@ The students undergone summer internship during VI semester summer vacation and same will be evaluated in VII semester.



# SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

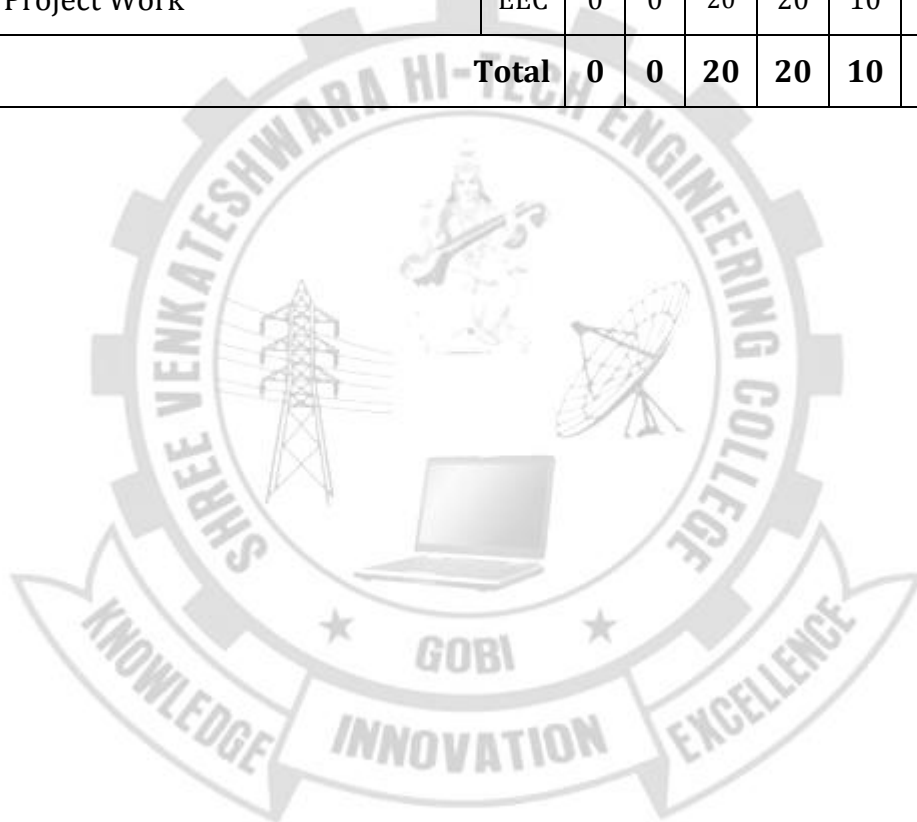
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BE-Civil Engineering

## SEMESTER VIII

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
<b>Practicals</b>											
1.	23CEL81	Project Work	EEC	0	0	20	20	10	40	60	100
<b>Total</b>				<b>0</b>	<b>0</b>	<b>20</b>	<b>20</b>	<b>10</b>			



**MANDATORY COURSES II**

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MCT51	Introduction to Women and Gender Studies	MC	3	0	0	3	0	100	-	100
2.	23MCT52	Elements of Literature	MC	3	0	0	3	0	100	-	100
3.	23MCT53	Film Appreciation	MC	3	0	0	3	0	100	-	100
4.	23MCT54	Disaster Risk Reduction and Management	MC	3	0	0	3	0	100	-	100

**MANDATORY COURSES III**

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MCT61	Well Being with Traditional Practices - Yoga, Ayurveda and Siddha	MC	3	0	0	3	0	100	-	100
2.	23MCT62	History of Science and Technology in India	MC	3	0	0	3	0	100	-	100
3.	23MCT63	Political and Economic Thought for a Humane Society	MC	3	0	0	3	0	100	-	100
4.	23MCT64	State, Nation Building and Politics in India	MC	3	0	0	3	0	100	-	100
5.	23MCT65	Industrial Safety	MC	3	0	0	3	0	100	-	100

**ELECTIVE - MANAGEMENT COURSES**

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MSE71	Principles of Management	HSS	3	0	0	3	3	40	60	100
2.	23MSE72	Total Quality Management	HSS	3	0	0	3	3	40	60	100
3.	23MSE73	Engineering Economics and Financial Accounting	HSS	3	0	0	3	3	40	60	100
4.	23MSE74	Human Resource Management	HSS	3	0	0	3	3	40	60	100
5.	23MSE75	Knowledge Management	HSS	3	0	0	3	3	40	60	100
6.	23MSE76	Industrial Management	HSS	3	0	0	3	3	40	60	100

**PROFESSIONAL ELECTIVE COURSES: VERTICALS**

<b>VERTICAL I (Structures)</b>	<b>VERTICAL II (Construction techniques and Practices)</b>	<b>VERTICAL III (Geotechnical)</b>	<b>VERTICAL IV (Geo-Informatics)</b>	<b>VERTICAL V (Transportation infrastructure)</b>	<b>VERTICAL VI (Environment)</b>	<b>VERTICAL VII (Water Resources)</b>	<b>VERTICAL VIII (Ocean Engineering)</b>	<b>VERTICAL IX (Diversified Course)</b>
Concrete Structures	Formwork Engineering	Geo- Environmental Engineering	Total Station and GPS Surveying	Airports and Harbours	Climate Change Adaptation and Mitigation	Participatory Water Resources Management	Ocean Wave Dynamics	Steel Concrete Composite Structures
Steel Structures	Construction Equipment and Machinery	Ground Improvemet Techniques	Remote Sensing Concepts	Traffic Engineering and Management	Air and Noise Pollution Control Engineering	Ground water Engineering	Marine Geotechnical Engineering	Finance For Engineers
Prefabricated Structures	Sustainable Construction and Lean Construction	Soil Dynamicsand Machine Foundations	Satellite Image Processing	Urban Planning and Development	Environmental Impact Assessment	Water Resources Systems Engineering	Coastal Engineering	Earth and Rockfill Dams
Prestressed Concrete Structures	Digitalized Construction Lab	Rock Mechanics	Cartography and GIS	Smart cities	Industrial Wastewater Management	Watershed Conservation and Management	Off shore Structures	Computational Fluid Dynamics
Rehabilitation/ Heritage Restoration	Construction Management and Safety	Earth and Earth Retaining Structures	Photogrammetry	Intelligent Transport Systems	Solid and Hazardous Waste Management	Integrated Water Resources Management	Port and Harbour Engineering	Rainwater Harvesting
Dynamics and Earthquake Resistant Structures	Advanced Construction Techniques	Pile Foundation	Airborne and Terrestrial laser mapping	Pavement Engineering	Environmental Policy and Legislations	Urban Water Infrastructure	Coastal Hazards and Mitigation	Transport and Environment
Introduction to Finite Element Method	Energy Efficient Buildings	Tunneling Engineering	Hydrographic Surveying	Transportation planning Process	Environment, Health and Safety	Water Quality and Management	Coastal Zone Managementand Remote Sensing	Environmental quality Monitoring

**Registration of Professional Elective Courses from Verticals:**

Professional Elective Courses will be registered in Semesters V and VI. These courses are listed in groups called verticals that represent a particular area of specialization / diversified group. Students are permitted to choose all the Professional Electives from a particular vertical or from different verticals. Further, only one Professional Elective course shall be chosen in a semester horizontally (row-wise). However, two courses are permitted from the same row, provided one course is enrolled in Semester V and another in semester VI.

The registration of courses for B.E./B.Tech (Honours) or Minor degree shall be done from Semester V to VIII. The procedure for registration of courses explained above shall be followed for the courses of B.E/B.Tech (Honours) or Minor degree also. For more details on B.E./B.Tech (Honours) or Minor degree refer to the Regulations 2023 [Clause 12].

**PROFESSIONAL ELECTIVE COURSES : VERTICALS****VERTICAL I: STRUCTURES**

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE11	Concrete Structures	PE	3	0	0	3	3	40	60	100
2.	23CEE12	Steel Structures	PE	3	0	0	3	3	40	60	100
3.	23CEE13	Prefabricated Structures	PE	3	0	0	3	3	40	60	100
4.	23CEE14	Prestressed Concrete Structures	PE	3	0	0	3	3	40	60	100
5.	23CEE15	Rehabilitation/Heritage Restoration	PE	3	0	0	3	3	40	60	100
6.	23CEE16	Dynamics and Earthquake Resistant Structures	PE	3	0	0	3	3	40	60	100
7.	23CEE17	Introduction to Finite Element Method	PE	3	0	0	3	3	40	60	100

**VERTICAL II: CONSTRUCTION TECHNIQUES AND PRACTICES**

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE21	Formwork Engineering	PE	3	0	0	3	3	40	60	100
2.	23CEE22	Construction Equipment and Machinery	PE	3	0	0	3	3	40	60	100
3.	23CEE23	Sustainable Construction and Lean Construction	PE	3	0	0	3	3	40	60	100
4.	23CEE24	Digitalized Construction Lab	PE	0	0	6	6	3	60	40	100
5.	23CEE25	Construction Management and Safety	PE	2	0	2	4	3	50	50	100
6.	23CEE26	Advanced Construction Techniques	PE	3	0	0	3	3	40	60	100
7.	23CEE27	Energy Efficient Buildings	PE	3	0	0	3	3	40	60	100



**VERTICAL III: GEOTECHNICAL**

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE31	Geo-Environmental Engineering	PE	3	0	0	3	3	40	60	100
2.	23CEE32	Ground Improvement Techniques	PE	3	0	0	3	3	40	60	100
3.	23CEE33	Soil Dynamics and Machine Foundations	PE	3	0	0	3	3	40	60	100
4.	23CEE34	Rock Mechanics	PE	3	0	0	3	3	40	60	100
5.	23CEE35	Earth and Earth Retaining Structures	PE	3	0	0	3	3	40	60	100
6.	23CEE36	Pile Foundation	PE	3	0	0	3	3	40	60	100
7.	23CEE37	Tunneling Engineering	PE	3	0	0	3	3	40	60	100

**VERTICAL IV: GEO-INFORMATICS**

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE41	Total Station and GPS Surveying	PE	3	0	0	3	3	40	60	100
2.	23CEE42	Remote Sensing Concepts	PE	3	0	0	3	3	40	60	100
3.	23CEE43	Satellite Image Processing	PE	3	0	0	3	3	40	60	100
4.	23CEE44	Cartography and GIS	PE	3	0	0	3	3	40	60	100
5.	23CEE45	Photogrammetry	PE	3	0	0	3	3	40	60	100
6.	23CEE46	Airborne and Terrestrial Laser Mapping	PE	3	0	0	3	3	40	60	100
7.	23CEE47	Hydrographic Surveying	PE	3	0	0	3	3	40	60	100

**VERTICAL V: TRANSPORTATION INFRASTRUCTURE**

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE51	Airports and Harbours	PE	3	0	0	3	3	40	60	100
2.	23CEE52	Traffic Engineering and Management	PE	3	0	0	3	3	40	60	100
3.	23CEE53	Urban Planning and Development	PE	3	0	0	3	3	40	60	100
4.	23CEE54	Smart Cities	PE	3	0	0	3	3	40	60	100
5.	23CEE55	Intelligent Transport Systems	PE	3	0	0	3	3	40	60	100
6.	23CEE56	Pavement Engineering	PE	3	0	0	3	3	40	60	100
7.	23CEE57	Transportation Planning Process	PE	3	0	0	3	3	40	60	100

**VERTICAL VI - ENVIRONMENT**

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE61	Climate Change Adaptation and Mitigation	PE	3	0	0	3	3	40	60	100
2.	23CEE62	Air and Noise Pollution Control Engineering	PE	3	0	0	3	3	40	60	100
3.	23CEE63	Environmental Impact Assessment	PE	3	0	0	3	3	40	60	100
4.	23CEE64	Industrial Wastewater Management	PE	2	0	2	4	3	50	50	100
5.	23CEE65	Solid and Hazardous Waste Management	PE	3	0	0	3	3	40	60	100
6.	23CEE66	Environmental Policy and Legislations	PE	3	0	0	3	3	40	60	100
7.	23CEE67	Environmental Health and Safety	PE	3	0	0	3	3	40	60	100

**VERTICAL VII: WATER RESOURCES**

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE51	Participatory Water Resources Management	PE	3	0	0	3	3	40	60	100
2.	23CEE52	Ground Water Engineering	PE	3	0	0	3	3	40	60	100
3.	23CEE53	Water Resources Systems Engineering	PE	3	0	0	3	3	40	60	100
4.	23CEE54	Watershed Conservation and Management	PE	3	0	0	3	3	40	60	100
5.	23CEE55	Integrated Water Resources Management	PE	3	0	0	3	3	40	60	100
6.	23CEE56	Urban Water Infrastructure	PE	3	0	0	3	3	40	60	100
7.	23CEE57	Water Quality and Management	PE	3	0	0	3	3	40	60	100

**VERTICAL VIII - OCEAN ENGINEERING**

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE61	Ocean Wave Dynamics	PE	3	0	0	3	3	40	60	100
2.	23CEE62	Marine Geotechnical Engineering	PE	3	0	0	3	3	40	60	100
3.	23CEE63	Coastal Engineering	PE	3	0	0	3	3	40	60	100
4.	23CEE64	Offshore Structures	PE	3	0	0	3	3	40	60	100
5.	23CEE65	Port and Harbour Engineering	PE	3	0	0	3	3	40	60	100
6.	23CEE66	Coastal Hazards and Mitigation	PE	3	0	0	3	3	40	60	100
7.	23CEE67	Coastal Zone Management and Remote Sensing	PE	3	0	0	3	3	40	60	100

**VERTICAL IX: DIVERSIFIED CORSES**

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE51	Steel Concrete Composite Structures	PE	3	0	0	3	3	40	60	100
2.	23CEE52	Finance for Engineers	PE	3	0	0	3	3	40	60	100
3.	23CEE53	Earth and Rock fill Dams	PE	3	0	0	3	3	40	60	100
4.	23CEE54	Computational Fluid Dynamics	PE	3	0	0	3	3	40	60	100
5.	23CEE55	Rainwater Harvesting	PE	3	0	0	3	3	40	60	100
6.	23CEE56	Transport and Environment	PE	3	0	0	3	3	40	60	100
7.	23CEE57	Environmental Quality Monitoring	PE	3	0	0	3	3	40	60	100

**OPEN ELECTIVES**

Sl. No	Course Code	Course Title	Category	Periods /Week			Credits	Max. Marks		
				L	T	P		CA	ES	TM
<b>OFFERED BY DEPARTMENT OF CIVIL ENGINEERING</b>										
1	23CE011	Civil and Infrastructure Engineering	OE	3	0	0	3	40	60	100
2	23CE012	Environmental Pollution and waste management	OE	3	0	0	3	40	60	100
3	23CE013	Environmental Impact Assessment	OE	3	0	0	3	40	60	100
4	23CE014	Building Services	OE	3	0	0	3	40	60	100
5	23CE015	Water, Sanitation and Health	OE	3	0	0	3	40	60	100
<b>OFFERED BY DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING</b>										
1	23CS011	Foundation of AR/VR	OE	2	0	2	3	50	50	100
2	23CS012	Web Designing	OE	2	0	2	3	50	50	100
3	23CS013	Block Chain fundamentals	OE	2	0	2	3	50	50	100
4	23CS014	Knowledge Management	OE	2	0	2	3	50	50	100
5	23CS015	Cloud Computing Essentials	OE	2	0	2	3	50	50	100

Sl. No	Course Code	Course Title	Category	Periods /Week			Credits	Max. Marks		
				L	T	P		CA	ES	TM
<b>OFFERED BY DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING</b>										
1	23EC011	Basics of electronics in automation	OE	3	0	0	3	40	60	100
2	23EC012	Optical engineering	OE	3	0	0	3	40	60	100
3	23EC013	E-waste management	OE	3	0	0	3	40	60	100
4	23EC014	Consumer electronics	OE	3	0	0	3	40	60	100
5	23EC015	Principles of communication engineering	OE	3	0	0	3	40	60	100
<b>OFFERED BY DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING</b>										
1	23EE011	Renewable Energy Sources	OE	3	0	0	3	40	60	100
2	23EE012	Electrical Vehicle	OE	3	0	0	3	40	60	100
3	23EE013	Energy Auditing and Conservation	OE	3	0	0	3	40	60	100
4	23EE014	Domestic and Industrial Electrical Installations	OE	3	0	0	3	40	60	100
5	23EE015	Microcontroller Based System Design	OE	3	0	0	3	40	60	100
<b>OFFERED BY DEPARTMENT OF MECHANICAL ENGINEERING</b>										
1	23ME011	Industrial Instrumentation	OE	3	0	0	3	40	60	100
2	23ME012	Energy Technology	OE	3	0	0	3	40	60	100
3	23ME013	Reverse Engineering	OE	3	0	0	3	40	60	100
4	23ME014	Fire Safety Engineering	OE	3	0	0	3	40	60	100
5	23ME015	Nano Technology	OE	3	0	0	3	40	60	100
<b>OFFERED BY DEPARTMENT ARTIFICIAL INTELLIGENCE AND DATA SCIENCE</b>										
1	23AD011	Introduction to Big Data	OE	2	0	2	3	50	50	100
2	23AD012	Principles of Data Science	OE	2	0	2	3	50	50	100
3	23AD013	Data Visualization and its Applications	OE	2	0	2	3	50	50	100
4	23AD014	Data Warehousing and Mining	OE	2	0	2	3	50	50	100
5	23AD015	Principles of Cyber Security	OE	2	0	2	3	50	50	100

Sl. No	Course Code	Course Title	Category	Periods /Week			Credits	Max. Marks		
				L	T	P		CA	ES	TM
<b>OFFERED BY DEPARTMENT INFORMATION TECHNOLOGY</b>										
1	23IT011	Basics of Java Programming	OE	2	0	2	3	50	50	100
2	23IT012	Ethical Hacking	OE	2	0	2	3	50	50	100
3	23IT013	E-Commerce and Applications	OE	2	0	2	3	50	50	100
4	23IT014	Basics of Android Application Development	OE	2	0	2	3	50	50	100
5	23IT015	Introduction to Web Design	OE	2	0	2	3	50	50	100
<b>OFFERED BY DEPARTMENT OF PHARMACEUTICAL TECHNOLOGY</b>										
1	23PT011	Nutraceuticals	OE	3	0	0	3	40	60	100
2	23PT012	IPR for Pharma Industry	OE	3	0	0	3	40	60	100
3	23PT013	Pharmaceutical Nanotechnology	OE	3	0	0	3	40	60	100
4	23PT014	Basics of Human Anatomy and physiology	OE	3	0	0	3	40	60	100
<b>OFFERED BY DEPARTMENT BIOMEDICAL ENGINEERING</b>										
1	23BM011	Biomedical Instrumentation	OE	3	0	0	3	40	60	100
2	23BM012	Medical Optics	OE	3	0	0	3	40	60	100
3	23BM013	Biometric systems and their applications	OE	3	0	0	3	40	60	100
4	23BM014	Healthcare Management systems	OE	3	0	0	3	40	60	100
5	23BM015	IOT in Medicine	OE	3	0	0	3	40	60	100