



**SRI MANAKULA VINAYAGAR**  
**ENGINEERING COLLEGE**  
(An Autonomous Institution)

Puducherry

**B.TECH.**  
**CIVIL ENGINEERING**

**ACADEMIC REGULATIONS 2023**  
**(R - 2023)**

**CURRICULUM**



**Dr.S. SUNDARARAMAN**, M.Tech., Ph.D.,  
Professor & Head  
Department of Civil Engg  
Sri Manakula Vinayagar Engg. College  
Madagadipet, Puducherry, India

## COLLEGE VISION AND MISSION

### Vision

To be globally recognized for excellence in quality education, innovation and research for the transformation of lives to serve the society.

### Mission

#### M1: Quality Education

To provide comprehensive academic system that amalgamates the cutting edge technologies with best practices.

#### M2: Research and Innovation

To foster value-based research and innovation in collaboration with industries and institutions globally for creating intellectuals with new avenues.

#### M3: Employability and Entrepreneurship

To inculcate the employability and entrepreneurial skills through value and skill based training.

#### M4: Ethical Values

To instill deep sense of human values by blending societal righteousness with academic professionalism for the growth of society.



Dr.S. SUNDARARAMAN, M.Tech., Ph.D.,  
Professor & Head  
Department of Civil Engg  
Sri Manakula Vinayagar Engg. College  
Madagadipet, Puducherry, India

## **DEPARTMENT VISION AND MISSION**

### **Vision**

We envision a world where the civil engineering department will be a home to an intellectual community with good quality education embedded with practical knowledge by inculcating research, strong social commitment and ethical values from its students, staffs and alumni.

### **Mission**

#### **M1: Quality Education**

To fulfill the requirements of construction industry, Civil Engineering profession and rural community through dissemination of technical services.

#### **M2: Practical Knowledge**

To impart quality and real-time education to the students with the knowledge & skills needed for Civil Engineering practice

#### **M3: Work Efficiency**

To encourage research, development and consultancy through sustained interaction with industry & research organization.

#### **M4: Societal issues**

To develop graduates to compete at the global level to deal with modern issues.

#### **M5: Moral & Ethical**

To insist ethical values and professionalism among the students.

## PROGRAMME OUTCOMES (POs)

**PO1: Engineering knowledge:**

Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**PO2: Problem analysis:**

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**PO3: Design/development of solutions:**

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

**PO4: Conduct investigations of complex problems:**

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

**PO5: Modern tool usage:**

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**PO6: The engineer and society:**

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

**PO7: Environment and sustainability:**

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

**PO8: Ethics:**

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

**PO9: Individual and team work:**

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO10: Communication:**

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

**PO11: Project management and finance:**

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

**PO12: Life-long learning:**

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

## PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

### PEO1: Fundamental Knowledge

To gain a thorough fundamental knowledge, problem solving skills, engineering experimental abilities, and design capabilities for a civil engineering career.

### PEO2: Knowledge and Skills

To establish the knowledge and skills necessary for identifying and assessing design alternatives and the related social, economic, environmental, and public safety impacts.

### PEO 3: Societal Implications

To develop the ability to deal effectively with ethical and professional issues, taking into account the broader societal implications of civil engineering

### PEO 4: Competent Professionals

To create competent professionals who are trained in the design and development of Civil Engineering systems to engulf research and development activities

## PROGRAM SPECIFIC OUTCOMES (PSOs)

### PSO 1: Practical Knowledge

Inculcating practical knowledge in planning, analysis, design and construction management without much exploiting natural resources.

### PSO 2: Critical Thinking

Imparting effective communicational skills, leadership attributes towards the team work and developing critical thinking abilities to find solutions for civil engineering problems of multi-disciplinary nature.

### PSO 3: Challenging Employment

Ability to take up any challenging employment, entrepreneurship, research and development for sustainable civil society as a civil engineering graduate.

  
Dr. S. SUNDARARAMAN, M.Tech., Ph.D.,  
Professor & Head  
Department of Civil Engg  
Sri Manakula Vinayagar Engg. College  
Madagadipet, Puducherry, India

## STRUCTURE FOR UNDERGRADUATE ENGINEERING PROGRAM

Sl. No	Course Category	Breakdown of Credits
1	Humanities and Social Sciences including Management courses (HS)	15
2	Basic Science Courses (BS)	20
3	Engineering Science including workshop, drawing, basics of electrical / mechanical / computer etc. (ES)	28
4	Professional Core Courses (PC)	66
5	Professional Electives Courses (PE)	18
6	Open Electives Courses (OE)	9
7	Project Work and Internship (PA)	13
8	Ability Enhancement Courses (AEC*)	0
9	Mandatory Courses (MC*)	0
<b>Total</b>		<b>169</b>

### SCHEME OF CREDIT DISTRIBUTION – SUMMARY

Sl.No	AICTE Suggested Course Category	Credits per Semester								Total Credits
		I	II	III	IV	V	VI	VII	VIII	
1	Humanities and Social Science (HS)	3	5	1	1	2	-	-	3	15
2	Basic Sciences(BS)	7	4	5	4	-	-	-	-	20
3	Engineering Sciences (ES)	11	5	4	4	4	-	-	-	28
4	Professional Core (PC)	1	7	13	10	8	15	12	-	66
5	Professional Electives (PE)	-	-	-	3	3	3	3	6	18
6	Open Electives (OE)	-	-	-	-	3	3	3	-	9
7	Project Work (PA)	-	-	-	-	1	1	2	8	12
8	Internship (PA)	-	-	-	-	-	-	1	-	1
9	Ability Enhancement Courses (AEC*)	-	-	-	-	-	-	-	-	0
10	Mandatory courses (MC*)	-	-	-	-	-	-	-	-	0
<b>Total</b>		22	21	23	22	21	22	21	17	169

**\* AEC and MC are not included for CGPA calculation**

SEMESTER – I										
Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
<b>Theory</b>										
1	U23MATC01	Engineering Mathematics - I	BS	3	1	0	4	25	75	100
2	U23BSTC01	Physical Science for Engineers	BS	3	0	0	3	25	75	100
3	U23ESTC01	Basics of Civil and Mechanical Engineering	ES	3	0	0	3	25	75	100
4	U23ESTC02	Engineering Mechanics	ES	2	1	0	3	25	75	100
5	U23ESTC03	Basics of Electrical and Electronics Engineering	ES	3	0	0	3	25	75	100
<b>Theory cum Practical</b>										
6	U23ENBC01	Communicative English I	HS	2	0	2	3	50	50	100
<b>Practical</b>										
7	U23ESPC01	Basics of Electrical and Electronics Engineering Laboratory	ES	0	0	2	1	50	50	100
8	U23ESPC02	Design Thinking and IDEA Lab	ES	0	0	2	1	50	50	100
9	U23CEP101	Civil Engineering Practice Laboratory	PC	0	0	2	1	50	50	100
<b>Ability Enhancement Course</b>										
10	U23CEC1XX	Certification Course – I**	AEC	0	0	4	-	100	-	100
<b>Mandatory Course</b>										
11	U23CEM101	Induction Programme	MC	2 Weeks			-	-	-	-
							22	425	575	1000

\*\* Certification courses are to be selected from the list given in Annexure III

SEMESTER – II										
Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
<b>Theory</b>										
1	U23MATC02	Engineering Mathematics - II	BS	3	1	0	4	25	75	100
2	U23CSTC01	Programming in C	ES	3	0	0	3	25	75	100
3	U23CET201	Mechanics of Solids I	PC	2	1	0	3	25	75	100
4	U23CET202	Building Materials and Construction	PC	2	1	0	3	25	75	100
5	U23HSTC01	UHV 2 (Universal Human Value)	HS	2	0	0	2	25	75	100

Theory cum Practical										
6	U23ENBC02	Communicative English II	HS	2	0	2	3	50	50	100
Practical										
7	U23CSPC01	Programming in C Laboratory	ES	0	0	2	1	50	50	100
8	U23ESPC03	Engineering Graphics using AutoCAD	ES	0	0	2	1	50	50	100
9	U23CEP202	Strength of Materials Laboratory	PC	0	0	2	1	50	50	100
Ability Enhancement Course										
10	U23CEC2XX	Certification Course – II**	AEC	0	0	4	0	100	-	100
Mandatory Course										
11	U23CEM202	Sports Yoga and NSS	MC	0	0	2	0	100	-	100
							21	525	575	1100

SEMESTER – III										
Sl. No.	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
Theory										
1	U23MATC03	Probability and Statistics	BS	3	1	0	4	25	75	100
2	U23ADTC01	Programming in Python	ES	3	0	0	3	25	75	100
3	U23CET303	Fluid Mechanics and Machinery	PC	3	0	0	3	25	75	100
4	U23CET304	Construction Technique, Equipment and Practices	PC	3	0	0	3	25	75	100
5	U23CET305	Mechanics of Solids II	PC	2	1	0	3	25	75	100
Theory cum Practical										
6	U23CEB301	Surveying and Geomatics	PC	2	0	2	3	50	50	100
Practical										
7	U23ENPC01	General Proficiency I	HS	0	0	2	1	50	50	100
8	U23MAPC01	Engineering Mathematics Laboratory	BS	0	0	2	1	50	50	100
9	U23ADPC01	Programming in Python Laboratory	ES	0	0	2	1	50	50	100
10	U23CEP303	Fluid Mechanics and Machines Laboratory	PC	0	0	2	1	50	50	100
Ability Enhancement Course										
11	U23CEC3XX	Certification Course – III**	AEC	0	0	4	0	100	-	100
12	U23CES301	Skill Enhancement Course - I*	SEC	0	0	2	0	100	-	100



Mandatory Course										
13	U23CEM303	Climate Change	MC	2	0	0	0	100	-	100
							23	675	625	1300

\* Skill Development Courses are to be selected from the list given in Annexure IV

SEMESTER – IV											
Sl. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks			
				L	T	P		CAM	ESM	Total	
<b>Theory</b>											
1	U23MATC04	Numerical Methods and Optimization	BS	3	1	0	4	25	75	100	
2	U23CSTC03	Data Structures	ES	3	0	0	3	25	75	100	
3	U23CET406	Geotechnical Engineering- I	PC	2	1	0	3	25	75	100	
4	U23CET407	Design of RC Elements	PC	2	1	0	3	25	75	100	
5	U23CEE4XX	Professional Elective - I <sup>#</sup>	PE	3	0	0	3	25	75	100	
<b>Theory cum Practical</b>											
6	U23CEB402	Concrete Technology	PC	2	0	2	3	50	50	100	
<b>Practical</b>											
7	U23ENPC02	General Proficiency II	HS	0	0	2	1	50	50	100	
8	U23CSPC02	Data Structures Laboratory	ES	0	0	2	1	50	50	100	
9	U23CEP404	Geotechnical Engineering Laboratory	PC	0	0	2	1	50	50	100	
<b>Ability Enhancement Course</b>											
10	U23CEC4XX	Certification Course – IV**	AEC	0	0	4	0	100	-	100	
12	U23CES402	Skill Enhancement Course - II*	SEC	0	0	2	0	100	-	100	
<b>Mandatory Course</b>											
13	U23CEM404	Right to Information and Good Governance	MC	2	0	0	0	100	-	100	
							22	625	575	1200	

\* Professional Electives are to be selected from the list given in Annexure I

SEMESTER – V											
Sl. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks			
				L	T	P		CAM	ESM	Total	
<b>Theory</b>											
1	U23HSTC02	Research Methodology	HS	2	0	0	2	25	75	100	
2	U23ITTC03	Programming in Java	ES	3	0	0	3	25	75	100	
3	U23CET508	Geotechnical Engineering- II	PC	2	1	0	3	25	75	100	
4	U23CET509	Water supply and Wastewater Engineering	PC	3	0	0	3	25	75	100	
5	U23CEE5XX	Professional Elective - II <sup>#</sup>	PE	3	0	0	3	25	75	100	

6	U23XXO5XX	Open Elective – I <sup>s</sup>	OE	3	0	0	3	25	75	100
<b>Practical</b>										
7	U23ITPC03	Programming In Java Laboratory	ES	0	0	2	1	50	50	100
8	U23CEP505	Water and Wastewater Engineering Laboratory	PC	0	0	2	1	50	50	100
9	U23CEP506	REVIT Architecture Laboratory	PC	0	0	2	1	50	50	100
<b>Ability Enhancement Course</b>										
10	U23CEC5XX	Certification Course – V**	AEC	0	0	4	0	100	-	100
<b>Project Work</b>										
11	U23CEW501	Micro Project	PA	0	0	2	1	100	-	100
<b>Mandatory Course</b>										
12	U23CEM505	Essence of Indian Traditional Knowledge	MC	2	0	0	0	100	-	100
							21	600	600	1200

<sup>s</sup>Open electives are to be selected from the list given in Annexure II

SEMESTER – VI										
Sl. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
<b>Theory</b>										
1	U23CET610	Design of Steel Structures	PC	2	1	0	3	25	75	100
2	U23CET611	Structural Analysis	PC	2	1	0	3	25	75	100
3	U23CET612	Transportation Engineering	PC	3	0	0	3	25	75	100
4	U23CEE6XX	Professional Elective - III <sup>#</sup>	PE	3	0	0	3	25	75	100
5	U23XXO6XX	Open Elective – II <sup>s</sup>	OE	3	0	0	3	25	75	100
<b>Theory cum Practical</b>										
7	U23CEB603	Instrumentation and sensor Technologies for Civil Engineering Application	PC	2	0	2	3	50	50	100
<b>Practical</b>										
8	U23CEP607	STAAD PRO V8i Laboratory	PC	0	0	2	1	50	50	100
9	U23CEP608	Transportation Engineering Laboratory	PC	0	0	2	1	50	50	100
10	U23CEP609	Survey Camp	PC	0	0	0	1	50	50	100
<b>Project Work</b>										
11	U23CEW602	Mini Project	PA	0	0	2	1	100	-	100
<b>Ability Enhancement Course</b>										
12	U23CEC6XX	Certification Course – VI**	AEC	0	0	4	0	100	-	100
<b>Mandatory Course</b>										
13	U23CEM606	Gender Equality	MC	2	0	0	0	100	-	100
							22	625	575	1200

SEMESTER – VII										
Sl. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
<b>Theory</b>										
1	U23CET713	Construction Management	PC	3	0	0	3	25	75	100
2	U23CET714	Hydrology and Water Resource Engineering	PC	3	0	0	3	25	75	100
3	U23CET715	Prefabricated Structures	PC	3	0	0	3	25	75	100
4	U23CEE7XX	Professional Elective – IV <sup>#</sup>	PE	3	0	0	3	25	75	100
5	U23XXO7XX	Open Elective – III <sup>\$</sup>	OE	3	0	0	3	25	75	100
<b>Practical</b>										
6	U23CEP710	Simulation Software Laboratory	PC	0	0	2	1	50	50	100
7	U23CEP711	Estimation Costing and Valuation Engineering	PC	0	0	2	1	50	50	100
8	U23CEP712	Modelling and Analysis Laboratory	PC	0	0	2	1	50	50	100
<b>Project Work</b>										
9	U23CEW703	Project Phase – I	PA	0	0	4	2	50	50	100
10	U23CEW704	Internship / Inplant Training	PA	0	0	2	1	100	-	100
							21	425	575	1000

SEMESTER – VIII										
Sl. No	Course Code	Course Title	Category	Periods			Credits	Max. Marks		
				L	T	P		CAM	ESM	Total
<b>Theory</b>										
1	U23HSTC03	Entrepreneurship and Business Management	HS	3	0	0	3	25	75	100
2	U23CEE8XX	Professional Elective – V <sup>#</sup>	PE	3	0	0	3	25	75	100
3	U23CEE8XX	Professional Elective – VI <sup>#</sup>	PE	3	0	0	3	25	75	100
<b>Project Work</b>										
4	U23CEW805	Project Phase – II	PA	0	0	16	8	50	100	150
							17	125	325	450

  
**Dr. S. SUNDARARAMAN**, M.Tech., Ph.D.,  
 Professor & Head  
 Department of Civil Engg  
 Sri Manakula Vinayagar Engg. College  
 Madagadipet, Puducherry, India

**Annexure – I**

**PROFESSIONAL ELECTIVE COURSES**

<b>Professional Elective – I (Offered in Semester IV)</b>		
<b>Sl. No.</b>	<b>Course Code</b>	<b>Course Title</b>
1	U23CEE401	Composite Structures
2	U23CEE402	Renewable Energy Sources
3	U23CEE403	Building Services
4	U23CEE404	Remote Sensing and GIS
5	U23CEE405	Alternative Building Materials and Technologies
<b>Professional Elective – II (Offered in Semester V)</b>		
<b>Sl. No.</b>	<b>Course Code</b>	<b>Course Title</b>
1	U23CEE506	Advanced Design of RCC Structures
2	U23CEE507	Air and Noise Pollution
3	U23CEE508	Sustainable and Lean Construction
4	U23CEE509	Airport and Harbor Engineering
5	U23CEE510	Green Building Technology
<b>Professional Elective – III (Offered in Semester VI)</b>		
<b>Sl. No.</b>	<b>Course Code</b>	<b>Course Title</b>
1	U23CEE611	Advanced Structural Analysis
2	U23CEE612	Pollution Control and Monitoring
3	U23CEE613	Buildings Codes and Requirement
4	U23CEE614	Traffic engineering and Management
5	U23CEE615	Urban Planning and Development
<b>Professional Elective – IV (Offered in Semester VII)</b>		
<b>Sl. No.</b>	<b>Course Code</b>	<b>Course Title</b>
1	U23CEE716	Structural Health Monitoring
2	U23CEE717	Municipal Solid Waste Management
3	U23CEE718	Quality Control and assurance in Construction
4	U23CEE719	Tunneling Engineering
5	U23CEE720	Architecture and Town Planning
<b>Professional Elective – V (Offered in Semester VIII)</b>		
<b>Sl. No.</b>	<b>Course Code</b>	<b>Course Title</b>
1	U23CEE821	Precast Structures
2	U23CEE822	Industrial Waste Disposal and Treatment

3	U23CEE823	Construction Safety
4	U23CEE824	Intelligent Transport System
5	U23CEE825	Interior Design
<b>Professional Elective – VI (Offered in Semester VIII)</b>		
<b>Sl. No.</b>	<b>Course Code</b>	<b>Course Title</b>
1	U23CEE826	Pre- Stressed Concrete Structures
2	U23CEE827	Environmental Impact Assessment
3	U23CEE828	Natural Disaster and Mitigation
4	U23CEE829	Bridge Engineering
5	U23CEE830	Smart City

### Annexure – II

#### OPEN ELECTIVE COURSES OFFERED BY CIVIL ENGINEERING

S. No	Course Code	Course Title
<b>Open Elective – I</b>		
1	U23CEOC01	Energy and Environment
2	U23CEOC02	Building Science and Engineering
<b>Open Elective – II</b>		
1	U23CEOC03	Disaster Management
2	U23CEOC04	Air Pollution and Solid Waste Management
<b>Open Elective – III</b>		
1	U23CEOC05	Energy Efficient Buildings
2	U23CEOC06	Global Warming and Climate Change

  
**Dr.S. SUNDARARAMAN**, M.Tech., Ph.D.,  
 Professor & Head  
 Department of Civil Engg  
 Sri Manakula Vinayagar Engg. College  
 Madagadipet, Puducherry, India