

Shree Warana Vibhag Shikshan Mandal's

**WARANA UNIVERSITY,  
WARANANAGAR**

(A State Public University established under Section 3 (6) of MPUA, 2016)

॥ विद्या सर्वस्य भूषणम् ॥



Warana University

Established: 2025

**Structure & Syllabus**  
of  
**First Year Master of Technology (M. Tech.)**  
In  
**Structural Engineering**  
**Department of Civil Engineering**  
Under

**Faculty of Science & Technology**

Structure and Syllabus in Accordance With

National Education Policy - 2020

With Effective from Academic Year 2025-26





Shree Warana Vibhag Shikshan Mandal's  
**TATYASAHEB KORE INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
(AUTONOMOUS), WARANANAGAR, KOLHAPUR



Lead Institute of



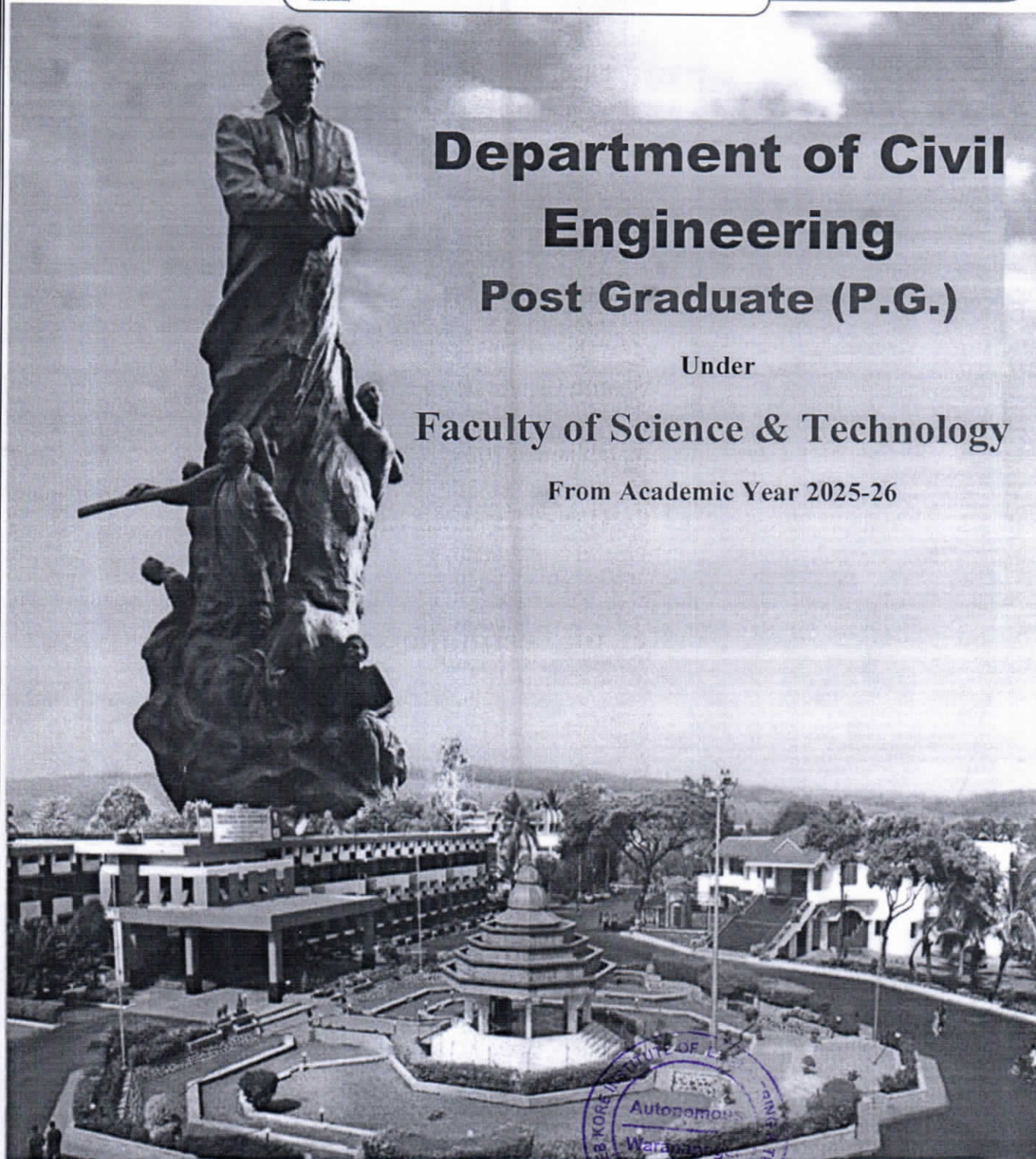
**WARANA UNIVERSITY, WARANANAGAR**  
(A State Public University)

# **Department of Civil Engineering Post Graduate (P.G.)**

Under

## **Faculty of Science & Technology**

From Academic Year 2025-26



### **M. Tech. in Structural Engineering**

Structure and Syllabus under Autonomy as per NEP Policy 2020



**Tatyasaheb Kore Institute of Engineering and Technology,  
Warananagar**

**M. Tech. Civil (Structural Engineering)**

AS per NEP 2020

(To be implemented from 2025-26)

### Abbreviations

Sr. No	Acronym	Definition
1	ISE	In-Semester Examination
2	ISE -I	In-Semester Examination I
3	ISE-II	In-Semester Examination II
4	ESE	End Semester Examination
5	TH	Theory Lecture
6	Tut	Tutorial
7	P	Practical
8	O	Oral
9	TW	Term Work
10	CH	Contact Hours
11	C	Credit

### Course/ Subjects Categories

Sr. No	Acronym	Definition
1	PCC	Professional Core Course
2	PE	Program Elective
3	OE	Open Elective Course
4	LC	Laboratory Course
5	MC	Mandatory Course
6	SW	Seminar work
7	II	Industrial Internship
8	PC	Dissertation
9	SLC/AC	Self-Learning Course/Audit course

#### CO, PO & PSO Mapping Correlation:

Low	Medium (Moderate)	High (Substantial)
1	2	3

#### Course/ Subject Code

P	1	0	1
Branch Code	Semester	Course Number	

#### Course Term work and POE Code

P	5	0	1
Branch Code	Semester	Course Number	



**Tatyasaheb Kore Institute of Engineering and Technology,  
Warananagar**

**M. Tech. Civil (Structural Engineering)**

AS per NEP 2020

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**Vision**

To become an academy of excellence in technical education and human resource development.

**Mission**

- To develop engineering graduates of high repute with professional ethics.
- To excel in academics and research through innovative techniques.
- To facilitate the employability, entrepreneurship along with social responsibility.
- To collaborate with industries and institutes of national recognition.
- To inculcate lifelong learning and respect for the environment.

**Quality Policy**

To promote excellence in academic and training activities by inspiring students for becoming competent professionals to cater industrial and social needs.



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AS per NEP 2020  
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**Department of Civil Engineering**

**Program Educational Objectives (PEO's)**

After completion of program, Post Graduates will be able to

1	<b>PEO1:</b> Demonstrate advanced knowledge in structural engineering concepts, design methodologies, and material behavior for reinforced and prestressed concrete, steel, and composite structures
2	<b>PEO2:</b> Apply analytical, computational, and experimental techniques to model, analyze, and design complex structural systems considering safety, durability, and serviceability.
3	<b>PEO3:</b> Develop innovative and sustainable solutions for structural engineering problems, including retrofitting, rehabilitation, and disaster-resistant design
4	<b>PEO4:</b> Engage in professional practice, research, and lifelong learning, effectively communicating ideas and leading multidisciplinary teams in academic, industrial, and construction environments.



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**Department of Civil Engineering**

**Program Outcomes (PO's)**

After completion of program, Post Graduates will be able to

PO1	<b>Demonstrate</b> knowledge in mathematics, basic sciences & civil engineering
PO2	<b>Identify</b> , formulate and solve civil engineering problems.
PO3	<b>Prepare</b> structural design such that fulfills design specification, durability, economy & safety.
PO4	<b>Design</b> and conduct experiment, analyze data & also interpret result to provide conclusion.
PO5	<b>Use</b> appropriate engineering techniques & software tools to analyze civil engineering problems.
PO6	<b>Apply</b> civil engineering knowledge for construction site in all respect like planning, execution and supervision.
PO7	<b>Sensitive</b> towards ethical, societal & environmental issue along with professional work.
PO8	<b>Exhibit</b> understanding of professional & ethical responsibility.
PO9	<b>Ability</b> to function as a leader of multidisciplinary team.
PO10	<b>Communicate</b> effectively in both verbal & written form.
PO11	<b>Develop</b> engineering research ability & project management skill.
PO12	<b>Possess</b> confidence for self-education & ability for lifelong learning.



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**Program Specific Outcomes (PSO's)**

**After completion of program, Post Graduates will be able to**

1	<b>PSO1:</b> Apply advanced concepts of structural analysis, design, and material science to develop safe, durable, and sustainable structures as per national and international codes
2	<b>PSO2:</b> Utilize modern computational tools, finite element methods, and experimental techniques to model, analyze, and design complex structural systems under static, dynamic, wind, and seismic loads.
3	<b>PSO3:</b> Demonstrate research aptitude and innovative thinking in solving real-life structural engineering problems, with emphasis on sustainability, retrofitting, and disaster resilience.





## First Year M. Tech. Civil (Structural Engineering)

### Curriculum Structure and Evaluation Scheme

#### Semester-I

Sr. No.	Category	Course Category	Course Code	Course Title	Teaching and Credit Scheme					Examination and Evaluation Scheme			
					L	T	P	C	CH	Component	Marks	Min. for Passing	
1	Programme Course	PCC	2501PCST PCC101	Mechanics of Structures	3	-	-	3	3	ESE	60	24	40
										ISE	40	16	
			2501PCST PCC101T	Mechanics of Structures (Tutorial)	-	1	-	1	1	ISA	25	10	10
			2501PCST PCC102	Structural Dynamics & Earthquake Engineering	3	-	-	3	3	ESE	60	24	40
										ISE	40	16	
			2501PCST PCC102T	Structural Dynamics & Earthquake Engineering (Tutorial)	-	1	-	1	1	ISA	25	10	10
2	Program Elective	PE	2501PCST PE103X	Program Elective-I	3	-	-	3	3	ESE	60	24	40
										ISE	40	16	
			2501PCST PE104X	Program Elective-II	3	-	-	3	3	ESE	60	24	40
										ISE	40	16	
			2501PCST PE105X	Program Elective-III	3	-	-	3	3	ESE	60	24	40
										ISE	40	16	
3	Laboratory Course	LC	2501PCST LC106P	Laboratory Practice	-	-	4	2	4	OE	25	10	20
										ISA	25	10	
4	Seminar Work	SW	2501PCST SW107T	Seminar-I	-	-	2	1	2	ISA	50	20	20
					15	2	6	20	23	--	650	260	260

**Note:** 'X' indicates the sequence number of Program Elective (PE) offered by Mechanical (Design Engineering) Program.





## First Year M. Tech. Mechanical Civil (Structural Engineering)

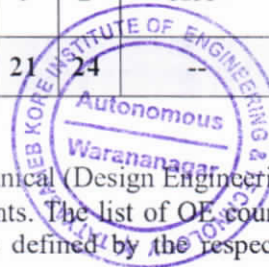
### Curriculum Structure and Evaluation Scheme

#### Semester-II

Sr. No.	Category	Course Category	Course Code	Course Title	Teaching and Credit Scheme					Examination and Evaluation Scheme			
					L	T	P	C	CH	Component	Marks	Min. for Passing	
1	Programme Course	PCC	2501PCST PCC201	Theory of Elasticity and Plasticity	3	--	--	3	3	ESE	60	24	40
										ISE	40	16	
		PCC	2501PCST PCC201T	Theory of Elasticity and Plasticity (Tutorial)	--	1	--	1	1	ISA	25	10	10
		PCC	2501PCST PCC202	Finite Element Methods	3	--	--	3	3	ESE	60	24	40
										ISE	40	16	
		PCC	2501PCST PCC202T	Finite Element Methods (Tutorial)	--	1	--	1	1	ISA	25	10	10
2	Program Elective	PE	2501PCST PE203X	Program Elective-IV	3	--	--	3	3	ESE	60	24	40
										ISE	40	16	
		PE	2501PCST PE204X	Program Elective-V	3	--	--	3	3	ESE	60	24	40
										ISE	40	16	
	Open Elective Course	OE	2501PCST OE205X	Open Elective Course	3	--	--	3	3	ESE	60	24	40
										ISE	40	16	
4	Laboratory Course	LC	2501PCST LC206P	Structural Design Lab	--	--	4	2	4	ISA	25	10	10
					--	1	--	1	1	OE	25	10	10
5	Seminar Work	SW	2501PCST SW207T	Seminar-II	--	--	2	1	2	ISA	50	10	10
					15	3	6	21	24	--	650	250	250

#### Note:

- 'X' indicates the sequence number of Program Elective (PE) offered by Mechanical (Design Engineering) Program.
- Students should opt for the Open Elective (OE) course from other departments. The list of OE courses offered by other departments is available in the structure. Although the OE course code is defined by the respective program in the structure, the actual opted OE course will appear on the mark card.





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## First Year M. Tech. Civil (Structural Engineering)

### List of Program Elective (PE)

#### Semester-I

	Course Code	Course Title
Program Elective-I	2501PCSTPE1031	Advance Design of Concrete Structures
	2501PCSTPE1032	Advances in Concrete Composite
	2501PCSTPE1033	Advanced Design of Prestressed Concrete Structures
Program Elective-II	2501PCSTPE1041	Design of RC Bridges
	2501PCSTPE1042	Structural Health Monitoring
	2501PCSTPE1043	Repairs and Rehabilitations of Structures
Program Elective-III	2501PCSTPE1051	Advanced Structural Analysis
	2501PCSTE1052	Stability of Structures
	2501PCSTPE1053	Dynamics of Structure

#### Semester-II

	Course Code	Course Title
Program Elective-IV	2501PCSTPE2031	Advanced Design of Structural Foundations
	2501PCSTPE2032	Theory of Plates and Shells
	2501PCSTPE2033	Advanced Design of Reinforced Concrete Structures
Program Elective-V	2501PCSTPE2041	Advanced Design of Steel Structures
	2501PCSTPE2042	Soil Structure Interaction
	2501PCSTPE2043	Design of High-Rise Buildings





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### List of Open Electives (OE) Courses

Sr. No.	OE Offered by Program	Course Code	Open Elective Course
1	Chemical Engineering	2501PCHEOE2051	Project Management
2		2501PCHEOE2052	Operations Research
3		2501PCHEOE2053	Energy Technology
4	Electronics & Telecommunication Engineering	2501PETCOE2051	Advanced Operating Systems
5		2501PETCOE2052	Cyber Security
6		2501PETCOE2053	Artificial Intelligence and Machine Learning
7	Construction Management (Civil Engineering)	2501PCCMOE2051	Water Power Engineering
8		2501PCCMOE2052	Waste to Energy
9		2501PCCMOE2053	Contracts & Tenders
10	Mechanical Design (Mechanical Engineering)	2501PMDEOE2051	Cryogenics
11		2501PMDEOE2052	Design for Manufacture & Assembly
12		2501PMDEOE2053	Enterprise Resource Planning
13	Structural Engineering (Civil Engineering)	2501PCSTOE2051	Cost Management of Engineering Projects
14		2501PCSTOE2052	Optimization Techniques in Civil Engineering
15		2501PCSTOE2053	Industrial Safety
16	Computer Science and Engineering	2501PCSEOE2051	Ethical AI & Explainability
17		2501PCSEOE2052	Computer Vision
18		2501PCSEOE2053	High Performance Computing for Multidisciplinary Research

