School of Engineering

MIT-ADT UNIVERSITY
PUNE, INDIA
A Leap Towards World Class Education

Programme Curriculum

MASTER OF TECHNOLOGY BY RESEARCH

PATTERN 2021

Civil Engineering
(Structural Engineering)

Faculty of Engineering

MIT ART DESIGN & TECHNOLOGY UNIVERSITY, PUNE

MIT SCHOOL OF ENGINEERING PUNE

STRUCTURE & SYLLABUS

FOR

Master of Technology - By Research - Civil Engineering - Structural Engineering

UNDER FACULTY OF ENGINEERING

3 Year Post Graduate Course sanctioned by AC & BoS

(w.e.f. 2021-2022)

(74 CREDITS)

Department of Civil Engineering

MIT SCHOOL OF ENGINEERING PUNE

syllabus for

Master of Technology – By Research - Civil Engineering - Structural Engineering

(M.Tech - Civil Engineering)

(With effect from Academic Year 2021-22)

DEAN **REGISTRAR**

VISION

Strive to build industry ready engineers having proficient and leadership qualities with capacity to undertake professional and research assignments in civil engineering with an interdisciplinary approach, for Sustainable Development.

MISSION

- To foster intellectual curiosity, build community empowered lives committed to purpose service, and leadership.
- The department is committed to mobilize the resources and equip itself with men and materials of excellence, thereby ensuring that the institution becomes a pivotal center of service to industry, academia, and society with the latest technology.
- To promote and undertake research as step towards sustainable development.
- To strengthen societal association with all stakeholders for holistic development of humanity
- To mentor students for innovative thinking with relevance to entrepreneurship.

M. Tech - Structural Engineering

Program Educational Objectives (PEOs)

1. Equip students with advanced structural engineering expertise to effectively analyze, design, and evaluate complex systems.
2. Foster a strong foundation in research methodologies and promote innovative thinking to advance the field of structural engineering through groundbreaking research and development.
3. Develop leadership skills and a strong sense of professional and ethical responsibility, preparing graduates to lead projects, make informed decisions, and contribute positively to society and the engineering community.

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 modelling 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.

Program Specific Outcomes (PSOs)

1. Exhibit solicitation of modern engineering tools and fundamental concepts of structural engineering for designing structures.
2. Autonomously evaluate socio-industrial problems and provide feasible solutions through critical thinking and research.
3. Have successful career in diverse sectors of Civil Engineering Industry and technical institutes through life-long learning

SCHOOL OF ENGINEERING
CIVIL ENGINEERING DEPARTMENT

MIT ART, DESIGN AND TECHNOLOGY UNIVERSITY, PUNE

MIT SCHOOL OF ENGINEERING, PUNE

STRUCTURE AND SYLLABUS

FOR

M. Tech. Structural Engineering

UNDER FACULTY OF ENGINEERING

SEMESTER I

Sr. No.	Course Code	Course Title	Teaching Scheme Periods per week			Credits	Evaluation Scheme		Total Marks	Category
			L	T	P/D		CA	FE		
1	21MTMT101R	Applied Mathematics for Engineers	4	0	0	4	50	50	100	BSC
2	21MTSE101R	Advanced Mechanics of Solids	4	0	0	4	50	50	100	DCC
3	21MTSE102R	Dynamics of Structure	3	0	0	3	50	50	100	DCC
4	21MTSE_____	Elective I	3	0	0	3	50	50	100	DEC
5	21MTSE_____	Elective II	3	0	0	3	50	50	100	DEC
6	21MTSE_____	Elective III	3	0	0	3	50	50	100	DEC
7	21MTSE111R	Structural Dynamics Laboratory	0	0	4	2	50	50	100	DCC
8	21MTSE121R	Innovation & Judgement Building	0	0	4	2	50	50	100	PRS
		Total	20	0	8	24	400	400	800	-

SEMESTER II

Sr. No.	Course Code	Course Title	Teaching Scheme Periods per week			Credits	Evaluation Scheme		Total Marks	Category
			L	T	P/D		CA	FE		
1	21MTSE201R	Design of Earthquake Resistant Structures	4	0	0	4	50	50	100	HSM
2	21MTSE202R	Finite Element Method	4	0	0	4	50	50	100	DCC
3	21MTSE203R	Theory of Plates and Shells	4	0	0	4	50	50	100	DCC
4	21MTSE_____	Elective IV	3	0	0	3	50	50	100	DEC
5	21MTSE_____	Elective V	3	0	0	3	50	50	100	DEC
6	21MTSE_____	Elective VI	3	0	0	3	50	50	100	DEC
7	21MTSE251R	Research Methodology	2	-	-	-	-	-	-	AEC
8	21MTSE211R	Structural Software Laboratory	0	0	4	2	50	50	100	DCC
9	21MTSE212R	Design Studio	0	0	4	2	50	50	100	DCC
		Total	23	0	8	24	400	400	800	-

SEMESTER III

Sr. No.	Course Code	Course Title	Teaching Scheme Periods per week			Credits	Evaluation Scheme		Total Marks	Category
			L	T	P/D		CA	FE		
1	21MTSE311R	Comprehensive Viva Voce	0	0	8	4	100	-	100	DCC
2	21MTSE321R	Dissertation Phase I	0	0	16	8	50	50	100	PRS
3	21MTSE322R	Technical Seminar	0	0	4	2	100	-	100	PRS
		Total	0	0	28	14	140	160	300	-

SEMESTER IV

Sr. No.	Course Code	Course Title	Teaching Scheme Periods per week			Credits	Evaluation Scheme		Total Marks	Category
			L	T	P/D		CA	FE		
1	21MTSE421R	Dissertation Phase II	0	0	28	14	100	200	300	PRS
		Total	0	0	28	14	100	200	300	-

LIST OF ELECTIVES

Course Code	Elective	Course Title
21MTSE131R	Elective I	Bridge Engineering
21MTSE132R		Structural Design of Formwork & Scaffolding
21MTSE133R		Design of Storage Structures
21MTSE134R		Construction Quality & Safety Management
21MTSE135R	Elective II	Advanced Concrete Technology
21MTSE136R		Stability of Structures
21MTSE137R		Theory of Elasticity
21MTSE138R		Advanced Design Steel Structures
21MTSE139R	Elective III	Analysis and Design of Machine Foundation
21MTSE140R		Introduction to Earthquake Engineering
21MTSE141R		Soil Structure Interaction
21MTSE142R		Blast Resistant Design of Structure
21MTSE231R	Elective IV	Advanced Reinforced Concrete Design
21MTSE232R		Economics & Finance for Engineers
21MTSE233R		Design of Tall Building
21MTSE234R		Design of Prestressed Concrete Structures
21MTSE235R	Elective V	Fire Engineering and Design
21MTSE236R		Performance Based Earthquake Engineering
21MTSE237R		Advanced Design of Foundations
21MTSE238R		Retrofitting of Structures
21MTSE239R	Elective VI	Plastic Analysis of Steel Structures
21MTSE240R		Design of Masonry Structures
21MTSE241R		Design of Industrial Steel Structures
21MTSE242R		Design of Hydraulic Structures