School of Engineering

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

Programme Curriculum

MASTER OF TECHNOLOGY

PATTERN 2021

Civil Engineering
(Environmental Engineering)

Faculty of Engineering

MIT ART DESIGN & TECHNOLOGY UNIVERSITY, PUNE

MIT SCHOOL OF ENGINEERING PUNE

STRUCTURE & SYLLABUS

FOR

Master of Technology
Civil Engineering - Environmental Engineering

UNDER FACULTY OF ENGINEERING

2 Year Post Graduate Course sanctioned by AC & BoS

(w.e.f. 2021-2022)

(74 CREDITS)

Department of Civil Engineering

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 – Environmental Engineering

Program Educational Objectives (PEOs)

1. In-depth understanding of advanced environmental engineering principles and practices, enabling them to design, analyze, and implement solutions for complex environmental challenges effectively.
2. Foster a strong foundation in research methodologies and promote innovative thinking to advance the field of environmental engineering through groundbreaking research and development.
3. Instill a strong ethical responsibility and commitment to sustainability in graduates, preparing them to create environmentally friendly and socially responsible engineering solutions.

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. Work in Environmental Engineering field which is involved with various aspects of planning, design, construction, and operation of Environmental Engineering systems.
2. Autonomously evaluate socio-industrial problems and provide feasible solutions through critical thinking and research.
3. Capable of conducting environmental impact assessments (EIAs) and incorporating sustainable development principles into engineering practices, addressing the environmental, social, and economic aspects of projects.

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STRUCTURE AND SYLLABUS

FOR

M. Tech. Environmental Engineering

UNDER FACULTY OF TECHNOLOGY

(w.e.f. 2021-2022)

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	21MTEE101	Advanced Water Treatment	3	1	0	4	40	60	100	DCC
2	21MTEE102	Environmental Chemistry	3	1	0	4	40	60	100	HMS
3	21MTEE103	Solid & Hazardous Waste Management	3	0	0	3	40	60	100	DCC
4	21MTEE____	Elective I	3	0	0	3	40	60	100	DEC
5	21MTEE____	Elective II	3	0	0	3	40	60	100	DEC
6	21MTEE____	Elective III	3	0	0	3	40	60	100	DEC
7	21MTEE111	Water & Solid Waste Analysis Laboratory	0	0	4	2	40	60	100	DCC
8	21MTEE121	Innovation &Judgement Building	0	0	4	2	40	60	100	PRS
		Total	18	2	8	24	380	420	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	21MTEE201	Advanced Wastewater Treatment	3	0	0	3	40	60	100	DCC
2	21MTEE202	Atmospheric Environmental Pollution & Control	3	1	0	4	40	60	100	DCC
3	21MTEE203	Environmental Health & Safety in Industries	3	1	0	4	40	60	100	HSM
4	21MTEE____	Elective IV	3	0	0	3	40	60	100	DEC
5	21MTEE____	Elective V	3	0	0	3	40	60	100	DEC
6	21MTEE____	Elective VI	3	0	0	3	40	60	100	DEC
7	21MTEE251	Research Methodology	3	0	0	NA				DAC
8	22MTEE211	Design Studio	0	0	4	2	100	00	100	DCC
9	21MTEE212	Wastewater and Air pollution Analysis Laboratory	0	0	4	2	40	60	100	DCC
		Total	18	2	8	24	320	480	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	21MTEE311	Comprehensive Viva Voce	0	0	8	4	-	100	100	DCC
2	21MTEE321	Dissertation Phase I	0	0	16	8	40	60	100	PRS
3	21MTEE322	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	21MTEE421	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
21MTEE131	Elective I	Environmental Management System
21MTEE 132		Air Quality Modelling
21MTEE 133		Energy & Environment
21MTEE 134		Green Building Design and Construction
21MTEE 135	Elective II	Global Warming and Climate Change
21MTEE 136		Instrumental Monitoring of Environment
21MTEE137		Fundamentals Of Sustainable Development
21MTEE138		Industrial Waste Water Management
21MTEE139	Elective III	Environmental Microbiology
21MTEE140		Ecological engineering
21MTEE141		Environmental Policies and Legislation
21MTEE142		Environmental Auditing
21MTEE231	Elective IV	Surface & Ground water Modelling
21MTEE232		Remote Sensing and GIS Applications in Environmental Engineering
21MTEE233		Cleaner Production and Environmental management
21MTEE234		Environmental Biotechnology
21MTEE235	Elective V	Environmental Risk Assessment
21MTEE236		Water resources systems management
21MTEE237		Environmental Geotechnology
21MTEE238		Agricultural Pollution and Control
21MTEE239	Elective VI	Membrane Technology in Environmental Engineering
21MTEE240		Climate change
21MTEE241		Nano technology for water and wastewater treatment
21MTEE242		Environmental Disaster Management