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
(Transportation 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 - Transportation 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

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 – By Research Transportation Engineering

Program Educational Objectives (PEOs)

1. Equip students with a thorough understanding of advanced transportation engineering principles and practices, enabling them to design, analyze, and manage complex transportation systems effectively.
2. Promote innovative thinking and rigorous research in transportation engineering to address emerging challenges and contribute to the advancement of the field.
3. Develop a strong sense of ethical responsibility and commitment to sustainability, preparing graduates to create transportation solutions that are safe, efficient, and environmentally friendly.

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. To produce graduates with good inter-personal skills and competency in communication and presentation to enable those to lead and work in multi-disciplinary team environments.
2. To prepare scholars for professional level employment in Government, public or private organizations; and to induce in them strong desire for higher education.
3. To proficient in utilizing geospatial tools and technologies for data analysis, mapping, and decision-making in transportation engineering, enabling them to assess spatial relationships and make informed choices in the planning and design of transportation infrastructure.

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M. Tech. by Research in Transportation Engineering

UNDER FACULTY OF TECHNOLOGY

(w. e. f. 2021-2022)

SEMESTER -I								
Course Code	**Course Name**	**Hours/week**				**Maximum Marks**		
		L	**T**	**P/D**	**Credits**	**CA**	**FE**	**Total**
21MTMT101	Applied Mathematics for Engineering	3	1	-	4	40	60	**100**
21MRTE102	Highway Design & Analysis	4	-	-	4	40	60	**100**
21MRTE111	Technical Seminar	-	-	16	8	100	--	**100**
Total		**07**	**01**	**16**	**16**	**180**	**120**	**300**
SEMESTER -II								
Course Code	**Course Name**	**Hours/week**				**Maximum Marks**		
		L	**T**	**P/D**	**Credits**	**CA**	**FE**	**Total**
21MRTE201	Research Methodology	3	1	-	4	40	60	**100**
21MRTE202	Advance Transportation System	3	1	-	4	40	60	**100**
21MRTE211	Research Proposal	-	-	12	6	40	60	**100**
Total		**06**	**02**	**12**	**14**	**120**	**180**	**300**
SEMESTER -III								
Course Code	**Course Name**	**Hours/week**				**Maximum Marks**		
		L	**T**	**P/D**	**Credits**	**CA**	**FE**	**Total**
21MRTE____	Elective I	3	0	0	3	40	60	**100**
21MRTE____	Elective II	3	0	0	3	40	60	**100**
21MRTE321	Research Progress Seminar-I (Literature Review)	-	-	16	8	100	100	**200**
Total		**06**	**00**	**16**	**14**	**180**	**220**	**400**
SEMESTER -IV								
Course Code	**Course Name**	**Hours/week**				**Maximum Marks**		
		L	**T**	**P/D**	**Credits**	**CA**	**FE**	**Total**
21MRTE421	Research Progress Seminar-II	-	-	16	8	100	100	**200**
Total		**00**	**00**	**16**	**08**	**100**	**100**	**200**

SEMESTER -V								
Course Code	**Course Name**	**Hours/week**				**Maximum Marks**		
		L	**T**	**P/D**	**Credits**	**CA**	**FE**	**Total**
21MRTE521	Research Progress Seminar-III	-	-	16	8	100	100	**200**
Total		**00**	**00**	**16**	**08**	**100**	**100**	**200**

SEMESTER-VI								
Course Code	**Course Name**	**Hours/week**				**Maximum Marks**		
		L	**T**	**P/D**	**Credits**	**CA**	**FE**	**Total**
21MRTE621	Research Progress Seminar- IV	-	-	16	8	100	100	**200**
21MRTE622	Dissertation	-	-	24	12	100	200	**300**
Total		**00**	**00**	**40**	**20**	**200**	**300**	**500**
Total Credits (I to VI)					**80**			

1. **The students have to select the Programme relevant to their research area from the regular M. Tech. Programme.**

2. **Research Proposal and Research Progress Seminar-I (Semester II & III):**

a. The students have to get the topic approval in consent with guide and get it approved in front of departmental Project Review Committee in the beginning of Second semester. (CA - 40 & 100 marks Resp.)

b. During the Research Progress Seminar (III Semester), paper should be published/communicated in Journal/Conference of SCIE/Scopus

c. A Research Scholar shall submit within two weeks before the end of second semester period, a written report of work done by him/ her in the prescribed proforma to the Guide who shall forward it to the Project Review Committee with his/her remarks for consideration by the Project Review Committee. The report should clearly indicate the progress achieved and cover the following points: (FE - 60 & 100 marks Resp.)

(i) Thesis proposal status

(ii) Progress made during the period of report

(iii) Publications/reports, if any

(iv) Problems/difficulty, if any

(v) Plans for future work

3. **Research Progress Seminar-II**

a. The students have to show the status of research work consent with guide and in front of Project Review Committee in the mid of Fourth semester CA- 100 marks and FE- 100 marks.

4. **Research Progress Seminar-III**

a. A Research Scholar shall submit within two weeks before the end of Fifth semester period, a written report of work done by him/ her in the prescribed proforma to the Guide who shall forward it to the Project Review Committee with his/her remarks for consideration by the Project Review Committee.

The report should clearly indicate the progress achieved and cover the following points: (CA-100 marks, FE- 100 marks)

(i) Thesis proposal status

(ii) Progress made during the period of report

(iii) Publications/reports, if any

(iv) Problems/difficulty, if any

(v) Plans for future work

5. Research Progress Seminar- IV:

The Pre-synopsis research progress seminar will be prior to submission of thesis in front of Project Review Committee in Sixth Semester (CA-100 marks, FE- 100 marks).

6. Dissertation

i. The final dissertation examination shall be taken by a panel of examiner consists of Supervisors, one examiner from the relevant field and Chairman (outside department) appointed by Chairman - Project Review Committee and an External examiner to be nominated by the Director/Dean/Exam Superintendent.

ii. The result will be declared only after acceptance or publication of full-length paper at least in peer reviewed Journal under UGC Care/SCIE/Scopus (Mandatory).

Elective list:

Course Code	Elective	Course Title
21MRTE331	**Elective I**	Highway Planning and Economic Analysis
21MRTE332		Transportation Planning
21MRTE333		Intelligent Transportation System
21MRTE334		Road Safety Audit
21MRTE335	**Elective II**	Transportation Equipment & Management
21MRTE336		Airports, Docks & Harbour Engineering
21MRTE337		Tunnel & Bridge Engineering
21MRTE338		Soil Mechanics in Transportation Engineering