RAMAIAH UNIVERSITY OF APPLIED SCIENCES

Programme Specifications

B. Tech. Programme

Programme: Transporatation Engineering	Department: Civil Engineering

Faculty of Engineering & Technology

M.S. Ramaiah University of Applied Sciences

University House, New BEL Road, MSR Nagar, Bangalore – 560 054

www.msruas.ac.in

Programme specifications: Transportation Engineering

Faculty	Engineering and Technology
Department	Civil Engineering
Programme	Transportation Engineering
Dean of Faculty	Prof. H. K. Narahari
HOD	Prof. H. M. Rajashekhar Swamy

1.   Title of the Award

M. Tech. in Transportation Engineering

2.   Modes of Study

Full-Time   ☒   Part-Time   ☒

3.   Awarding Institution /Body

M.S. Ramaiah University of Applied Sciences – Bangalore, India

4.   Joint Award

--

5.   Teaching Institution

Faculty of Engineering and Technology (FET)

M S Ramaiah University of Applied Sciences - Bangalore, India

6.   Date of Programme Specifications

Feb 2016

7.   Date of Programme Approval by the Academic Council of MSRUAS

May 2016

8.   Next Review Date

May 2018

9.   Programme Approving Regulatory Body and Date of Approval

10.   Programme Accrediting Body and Date of Accreditation

--

11.   Grade Awarded by the Accreditation Body

--

12.   Programme Accreditation Validity

--

13.   Programme Benchmark

--

14.   Rationale for the Programme

Civil Engineering is primarily infrastructure development involving planning, design, construction, and operation of facilities essential to modern life, ranging from transit systems to offshore structures to space satellites. Major disciplines within civil engineering that are closely interrelated are Structural, Environmental, Geotechnical, Water Resources, Transportation, Construction and Urban Planning.

Until recently Civil Engineering teaching was limited to Planning, Analysis, Design and Execution of different types of infrastructure like buildings, roads, bridges, dams and power plants. However, increasing technological sophistication and demand for higher living standards fuelled by economic growth and concerns about environmental impact have changed the scope of Civil Engineering curriculum.

Transportation engineering is one of the major branches of civil engineering and it involves planning, design, construction, operation and maintenance of transportation facilities. The facilities support air, highway, railroad, pipeline, water, and even space transportation. Transportation engineering includes sizing of transportation facilities, selection of materials and design of pavement and geometry of roadway.

In Transportation Engineering, students acquire advanced know-how concerning the planning, design, operations, performance, evaluation, maintenance and rehabilitation of transportation systems including their economics and social aspects. This field imbibes in each student analytic, problem-solving and management skills suitable for public and private sector professional works. Students are trained on the application of various softwares and programming skills for simulation of traffic flow and Intelligent Transportation System (ITS) to address urban transportation issues. The challenges faced in transportation engineering are developing network links and major terminals to satisfy transportation demands, with due regard for the resultant land-use, environmental and other impacts of these facilities.

Primary responsibility of a University is to produce qualified human resource trained to sustain growth of transportation industry by adopting innovative technologies and skilled project handling strategies to overcome these challenges. Even though there are a large number of institutions in India producing Transportation Engineers, there is a shortage of quality Transportation Engineering graduates. The FET at MSRUAS would like to offer Transportation Engineering courses to produce imaginative, creative and innovative Transportation Engineers.

MSRUAS is offering Transportation Engineering programme at the postgraduate level. The programme focuses on addressing the professional service needs of the transportation industry like planning, designing, maintenance and evaluation of various transportation facilities. The programme also involves studying, simulation and suggesting remedial measures for various traffic issues. The graduates will get opportunities in well-known infrastructure companies involved in transportation planning and construction where they exhibit effective and efficient problem solving skills to provide economical and sustainable solutions in India and abroad.

The faculty of engineering and technology plans further development of Transportation engineering and compete with the best universities in the world and attract high quality graduates as well as teaching talent from all over the country and abroad.

15. Programme Aim

The aim of the programme is to produce postgraduates with advanced knowledge and understanding of Transportation Engineering; higher order critical, analytical, problem solving and transferable skills; ability to think rigorously and independently to meet higher level expectations of transportation industry, academics, research or take up entrepreneurial route.

16. Programme Objectives

Students will be able to apply the knowledge, understanding and skills acquired to carry out design, simulation, analysis and evaluation of transportation projects. Emphasis will be placed on technical and economical approach to address transportation problems.

The objectives of the programme are to enable the students to:

1. Evaluate different modes of transportation based on travel demand forecasting and travel demand distribution models
2. Select appropriate materials and technology to design, construct, maintain and rehabilitate highways
3. Apply artificial intelligence and Intelligent Transportation System (ITS) to solve urban transportation issues
4. Use various software tools to model and simulate traffic flow to manage traffic issues
5. Analyse and design various types of bridges for road and railway projects
6. Develop and administer project budgets, fiscal control, contract and quality control provisions
7. Develop a career in transportation industry
8. Practice teamwork, lifelong learning and continuous improvement

17.   Intended Learning Outcomes of the programme

The Intended Learning Outcomes (ILOs) are listed under four headings:

1.   Knowledge   and   Understanding,   2.   Cognitive   Skills,   3.   Practical   Skills   and   4. Capability/Transferable Skills.

17.1   Knowledge and Understanding

After undergoing this programme, a student will be able to:

KU1:   Describe advantages and disadvantages of various pavement materials, construction methods and equipments used in pavement construction

KU2:   Describe the critical factors in design of pavement to achieve quality, durability, sustainability and economic objectives

KU3:   Explain principles of travel demand forecasting, modal split and traffic assignment, road safety used in transportation planning

KU4:   Explain form work, modern construction techniques, properties of modern construction materials and equipments applied to engineering construction for sub, super and special structures, rehabilitation, strengthening and demolition techniques

17.2   Cognitive Skills

After undergoing this programme, a student will be able to:

CS1:   Analyse and design various pavement systems, maintenance techniques to meet the overall expectation of the road project

CS2:   Analyse and propose traffic study, simulation and remedial measure essential for solving a broad set of traffic problems in transportation industry considering societal and economic impacts

CS3:   Plan surveys to collect and analyse data required for transportation planning

CS4:   Propose and design various types of bridges for a road/railway project

17.3   Practical Skills

After undergoing this programme, a student will be able to:

PS1:   Produce detailed project report along with the ability to carry out various studies essential for the preparation of DPR in different stages

PS2:   Use appropriate software packages relevant to transportation engineering

PS3:   Conduct physical tests to evaluate performance of pavement materials and mixes

PS4:   Perform laboratory tests on model structures to understand their behaviour

17.4   Capability/Transferable Skills

After undergoing the programme, a student will be able to

TS1:   Evaluate and appraise the context within which transportation industry operates

TS2:   Adopt a reflective approach to personal development and embrace the philosophy of continual professional development

TS3:   Present information concisely in narrative and verbal form

TS4:   Work effectively in groups and lead the group

18.   Programme Structure

A student is required to successfully complete the following modules for the award of the degree. The programme is delivered as per the Time-Table for every batch.

Module Code	Modules	Credits	Duration (Weeks)
Programme: Transportation Engineering			
	Department- Common Modules		
CVE504	1. Modern Construction Technology	5	5
CVE505	2. Advanced Concrete Technology and Pre-cast Structures	5	5
CVE503	3. Finite Element Analysis of Civil Structures	5	5
	Course - Specialization Modules		
CEM507	4. Construction Planning and Contract Management	5	5
TRE501	5. Pavement Engineering	5	5
TRE502	6. Traffic Engineering and Simulation	5	5
TRE503	7. Transportation Planning	5	5
TRE504	8. Intelligent Transportation System	5	5
TRE505	9. Bridge Engineering and Road Projects	5	5
	Faculty-Common Modules		
FET501	1. Principles of Management and Soft Skills Development	3	3
FET502	2. Research Methodology	3	3
	Elective Module (Any One of 6)	5	5
FET503	1. Industry Internship		
FET504	2. Seminar		
FET505	3. Training		
FET506	4. Student Competition		
FET507	5. Visit to Industries and Exhibitions		
FET508	6. Teaching and Training		
TRE599	**Group Work-Project**	10	10
TRE600	**Dissertation**	30	26
	Mandatory Module (Any One)	4	4
FET509	1. Conference Publication		
FET510	2. Journal Publication		
		100	96

Note:

1. The Vacations and other activities shall be as per the Time-Table for the corresponding batch.

19.   Module Delivery Structure- Full-Time

A module is delivered from Monday to Friday of the week. The lecture classes will be normally held from 9.30 AM to 1.00 PM with 30 minutes of break. The laboratory classes will be held in the afternoon from 2.00PM to 5.00 PM during the first two weeks of the module.

Week-1	Week-2	Week-3	Week-4	Week-5
Module Delivery	Module Delivery	Study Work	Study Work	Assignment submission & Presentation
			Examination	

For Part-Time, the classes are normally held on Saturday and Sunday and the module delivery is for 8 weeks.

20.   Teaching and Learning Methods

The module delivery comprises of a combination of few or all of the following:
1. Face to Face Lectures using Audio-Visuals
2. Workshops, Group Discussions, Debates, Presentations
3. Demonstrations
4. Guest Lectures
5. Laboratory/Field work/Workshop
6. Industry Visit
7. Seminars
8. Group Exercises
9. Project Exhibitions
10. Technical Festivals

21.   Elective Module

Elective module can be any one of the following -

FET503   Industry Internship
Internship is to be done with a company or any business or research organization for the module duration. The student is required to submit a report for assessment and also make a presentation to a team of examiners. The internship should be in the company related to the course. A student is required to find internship on his/her own but the student placement office may assist in getting internship.

FET504   Seminar
A student can deliver a seminar of one hour duration of his/her original study on a contemporary topic after personal visits/survey/collection data. It should not be a collection of information from books/web resources and delivering a presentation/ preparing a report. Topic of seminar should be registered at the beginning of the elective module. At the end, seminar must be delivered to a team of examiners and also a word processed report must be submitted for assessment.

FET505   Training
A student can undergo training in any institution or any other organization in a specific subject area that falls under the broad category of his/her specialization. He/she need to submit a complete report on the training undergone and also make a presentation to a team of examiners for assessment.

FET506   Student Competition
A student can take part in a technical competition approved by the department; a Report shall be submitted followed by a presentation to a team of examiners for assessment.

FET507   Visit to Industries and Exhibitions
A student is required to make industry visits and international exhibitions as per the recommendations of the department and submit a report; and make a presentation to a team of examiners for assessment.

FET508   Teaching and Training
A student can teach a module in his / her area of specialization in any institute approved by the department. The student must submit the teaching notes and also make a presentation to a team of examiners for assessment.

FET509   Conference Publication
A student can submit a paper and make a presentation in a conference which is approved by the department. The same paper shall be presented for assessment and the student is required to make a presentation to a team of examiners for assessment.

FET510   Journal Publication
A student can publish a paper in a technical journal. The proof of submission and a copy of the paper shall be submitted to the department. It will be assessed based on a presentation to a team of examiners.

22.   Group Project

TRE599   A group shall have up to 5 students. The purpose of group project is that the group should be able to design a product in their area of specialization and develop it. The students are required to develop a report for assessment and also need to demonstrate the working of the product. The IPR rights of all such work lies with the University only. The students are required to sign an agreement before the commencement of the project. The project should be approved by a committee of examiners before the start of the project. Students can choose a project from the database of projects available with the concerned department. The detailed procedure and evaluation procedure will be provided in Operation Manual / Student Handbook

23.   Dissertation

TRE600   A student chooses a topic for the dissertation based on relevance and need. The detail procedure of executing and assessing dissertation is available as a standard template in i-portal

24.   Assessment and Grading

A module assessment will have two components:
Component - 1
Assignment 50% weight
Component -2
Examination 50% weight

(Note: For more details on the break-ups, please refer to the Module Specifications)

A student is required to score a minimum of 40% in each of the components and an overall of 40% for successful completion of a module and earning the credits.

Note: Final marks awarded in each of the modules will be confirmed only after SAB/PAB as explained in Academic Regulations of M.Tech. Programme.

25.   Failure and Readmissions

If a student fails in a module, he/she is required to re-attend the module when offered next time by re-registering to the module.

26.   Attendance

A student is required to have a minimum of 85% attendance to be eligible to write the examination. Less than 85% attendance is considered FAIL; such a student is required to follow the same procedure as that of a failed student.

Any condoning of shortfall of the attendance is as per the Academic Regulations for M.Tech. Programme.

27.   Award of Class

As per the Academic Regulations for M.Tech. Programme.

28.   Student Support for Learning

Students are given the following support:

1. Module notes
2. Reference books in the library
3. Magazines and Journals
4. Internet facility
5. Computing facility
6. Laboratory facility
7. Workshop facility
8. Staff support
9. Lounges for discussions
10. Any other support that enhances their learning

29.   Quality Control Measures

Following are the Quality Control Measures:

1. Review of module notes
2. Review of question papers and assignment questions
3. Student feedback
4. Moderation of assessed work
5. Opportunities for the students to see their assessed work
6. Review by external examiners and external examiners reports

7. Staff student consultative committee meetings
8. Student exit feedback
9. Subject Assessment Board
10. Programme Assessment Board

30. Curriculum Map

Module Code	Intended Learning Outcomes											
	Knowledge and Understanding				Cognitive (Thinking) Skills (Critical, Analytical, Problem Solving, Innovation)				Practical Skills			
	KU1	KU2	KU3	KU4	CS1	CS2	CS3	CS4	PS1	PS2	PS3	PS4
CVE504	X	X		X	X		X				X	X
CVE505					X					X		X
CVE503	X	X	X	X	X	X	X		X			
CVE507		X	X	X	X	X	X		X	X		
TRE501	X	X			X						X	X
TRE502			X			X	X		X	X		
TRE503			X			X	X			X		
TRE504						X				X		
TRE505							X	X	X			X
FET501												
FET502	X	X	X	X								
FET503	X	X		X	X			X	X		X	X
FET504	X	X	X	X	X	X	X	X	X	X	X	X
FET505	X	X	X	X	X			X	X			X
FET506	X	X		X	X			X	X	X		X
FET507	X	X	X	X								
FET508	X	X	X	X	X	X	X	X	X			X
FET509	X	X	X	X	X	X	X	X	X	X	X	X
FET510	X	X	X	X	X	X	X	X	X	X	X	X
TRE599	X	X	X	X					X	X	X	X
TRE600	X	X	X	X	X	X	X	X	X	X	X	X

31. Capability / Transferable Skills Map

Module Code	Group work	Self learning	Research Skills	Written Communication Skills	Verbal Communication Skills	Presentation Skills	Behavioral Skills	Information Management	Personal management/ Leadership Skills
CVE504		X		X	X	X			X
CVE505		X		X	X	X			X
CVE503		X		X	X	X			X
CVE507		X		X	X	X			X
TRE501		X		X	X	X			X
TRE502		X		X	X	X			X
TRE503		X		X	X	X			X
TRE504		X		X	X	X			X
TRE505		X		X	X	X			X
FET501	X			X	X	X	X		X
FET502			X	X	X	X		X	
FET503		X		X	X	X	X		
FET504		X	X	X	X	X		X	
FET505				X	X	X			
FET506	X	X	X	X	X	X	X	X	X
FET507		X		X	X	X		X	
FET508		X		X	X	X	X	X	X
FET509		X	X	X	X	X			
FET510		X	X	X	X	X			
TRE599	X	X		X	X	X	X	X	X
TRE600		X	X	X	X	X	X	X	X

32. Co-curricular Activities

Students are encouraged to take part in co-curricular activities like seminars, conferences, symposium, paper writing, attending industry exhibitions, project competitions and related activities to enhance their knowledge and network.

33. Cultural and Literary Activities

To remind and ignite the creative endeavours annual cultural festival is held and the students are made to plan and organize the activities.

34. Sports and Athletics

Students are encouraged to develop a habit of taking part in outdoor and indoor games on regular basis.

ಊ◉ಜ