



Programme Specifications

B. Tech. Programme

Programme:
Construction Engineering and
Management

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: Construction Engineering and Management

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

1. Title of the Award

M. Tech. in Construction Engineering and Management

2. Modes of Study

Full-Time ☒ Part-Time ☒

3. Awarding Institution /Body

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

4. Joint Award

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5. Teaching Institution

Faculty of Engineering and Technology (FET)

M S Ramaiah University of Applied Sciences - Bangalore, India

6. Date of Programme Specifications

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

February 2016 (Revised version of 2014)

8. Next Review Date

May 2016

9. Programme Approving Regulatory Body and Date of Approval

May 2018

10. Programme Accrediting Body and Date of Accreditation

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11. Grade Awarded by the Accreditation Body

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12. Programme Accreditation Validity

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13. Programme Benchmark

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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 fueled by economic growth and concerns about environmental impact have changed the scope of Civil Engineering curriculum.

The construction industry may be defined as comprising those organizations involved in design, production, alteration, renovation, maintenance, facility management, demolition and re - cycling of building and civil engineering works, including the supply of resources. It includes all internal and external stakeholders who in some way or another promote the industry's policies, procedures, practices.

Indian construction industry is one of the fastest growing industry and the second largest employer next to agriculture. In the recent times, India has stepped up its development agenda which is evident from aggressive pace of construction activities in the country. Government of India, for the first time incorporated a chapter on construction in the 10th five year plan (2002–2007) and hence enhanced the investment in infrastructure two folds.

New mega-project, involvement of international consultants and participation of Indian consultants/contractors in international projects has led to infusion of new materials, equipment and technologies in the construction practices in India. In its path of advancement, the industry has to overcome a number of challenges. With a lot of stress on reducing carbon emission and interdependencies between resources, a Civil Engineer needs world-class skill base coupled with flair for innovation and understanding of the interdependencies between resources and infrastructural demands.

Primary responsibility of a University is to produce qualified human resource trained to sustain growth of construction 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 Civil Engineers, there is a shortage of quality Civil Engineering graduates. The FET at MSRUAS would like to offer Civil Engineering programme to produce imaginative, creative and innovative Civil Engineers.

MSRUAS is offering construction engineering and management programme at the postgraduate level. The programme focuses on addressing the professional services needs of the construction industry like litigation, training of artisans, cost indices, contracting, insurance, finance, banking and taxation. The graduates will get opportunities in well-known construction companies and will be effective and efficient problem solvers providing economical and sustainable infrastructure solutions in India and abroad.

The faculty of engineering and technology plans further development of Construction Engineering and Management 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 Construction Engineering and Management; higher order critical, analytical, problem solving and transferable skills; ability to think rigorously and independently to meet higher level expectations of civil construction 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 engineering design, simulation, analysis, synthesis and evaluation of construction projects. Emphasis will be placed on imaginative and creative approach to Construction Engineering and Management.

The objectives of the programme are to train and educate the students on the following :

1. Modern construction materials, methods and equipment
2. Planning and formulation of design alternatives and solutions for construction projects
3. Developing and administering project budgets and fiscal controls, contract and quality control provisions
4. Selection of materials, construction method and designing of construction process
5. Reviewing the contract strategies for construction projects and to suggest the appropriate contract forms and payment methods
6. Planning and controlling project cost including cost estimating, risk analysis, determination of contingencies, progress reporting and value engineering
7. Application of IT tools in project planning, design and management
8. Corporate and construction industry practice, process, standards and their impact on project activities giving general perspective and opportunities for a career in the construction industry
9. 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: Explain structural systems, form work, construction techniques, resources, economic principles, properties of modern construction materials and equipment applied to engineering construction for sub structure, super structure, special structures, rehabilitation and strengthening techniques and demolition techniques, Intelligent Systems, significance of green and alternate building materials
- KU2: Describe the factors critical in planning and designing construction processes to achieve needed safety, quality, durability, sustainability, and economic objectives, concepts of cost effective building design
- KU3: Explain formulation, planning, scheduling, cost and quality control, safety, construction system integration, environmental factors, services, maintenance and safety systems in construction engineering
- KU4: Discuss advantages, disadvantages and limitations of various construction materials, types of special concretes and their application, construction process, equipment, strategies, optimization techniques, inventory models, scheduling techniques, structural systems and services in construction engineering

17.2 Cognitive Skills

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

- CS1: Design and analyze various structural systems, form work, construction techniques and processes of sub systems/components of a project to meet the overall specifications of the project
- CS2: Analyze and propose construction technique and management technique changes essential for solving a broad set of engineering problems in construction considering societal and economic impacts to achieve needed safety, quality, durability, sustainability, and economic objectives
- CS3: Evaluate the performance of the various construction materials, special concretes, personnel, construction processes, equipment, strategies, optimization techniques, inventory models, scheduling techniques, structural systems and services in construction engineering
- CS4: Propose and implement various safety norms in a construction project

17.3 Practical Skills

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

- PS1: Produce tender and contract documents along with the ability to carry out estimation of costs and expenditures during all project stages
- PS2: Use appropriate software packages relevant to construction industry
- PS3: Conduct physical tests to evaluate performance of civil construction materials
- PS4: Perform laboratory tests on models structures to understand their behavior

17.4 Capability/Transferable Skills

After undergoing the programme, a student will be able to

- TS1: Manage information, develop technical reports and make presentations
- TS2: Build, Manage and Lead a team to successfully complete a project and communicate across teams and organizations to achieve professional objectives
- TS3: Work under various constraints to meet project targets
- TS4: Adopt to the chosen profession by continuously upgrading his/her knowledge and understanding through Life-long Learning philosophy

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.

Programme: Construction Engineering and Management			
Module Code	Modules	Credits	Duration (Weeks)
Department- Common Modules			
CVE504	1. Modern Construction Technology	5	5
CVE505	2. Advanced Concrete Technology and Precast Structures	5	5
CVE503	3. Finite Element Analysis of Civil Structures	5	5
Programme- Specialization Modules			
CEM507	1. Construction Planning and Contract Management	5	5
CEM508	2. Green Construction and Alternate Building Materials	5	5
CEM509	3. Intelligent Systems in Construction Management	5	5
CEM504	4. Resource Management in Civil Construction	5	5
CEM505	5. Construction Economics and Financial Management	5	5
CEM506	6. Construction Quality and Safety Management	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		
CEM599	Group Work-Project	10	10
CEM600	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 programme. 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.

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- 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

- CEM599 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

- CEM600 A student chooses a topic for the Dissertation from the database of the projects available with the concerned department. The detail procedure of executing and assessing Dissertation is available as 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	X		
CVE505	X			X	X		X			X	X	
CVE503	X	X	X	X	X	X	X		X			
CEM507		X	X	X		X	X			X		
CEM508	X	X	X	X		X	X	X				
CEM509	X					X	X			X		
CEM504	X		X	X			X					
CEM505	X	X	X	X	X	X	X		X			
CEM506		X	X			X	X	X			X	X
FET501												
FET502												
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
CEM599	X	X	X	X					X	X	X	X
CEM600	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
CEM507		X		X	X	X			X
CEM508		X		X	X	X			X
CEM509		X		X	X	X			X
CEM504		X		X	X	X			X
CEM505		X		X	X	X			X
CEM506		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			
CEM599	X	X		X	X	X	X	X	X
CEM600		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 endeavors 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.

