DEPARTMENT OF CIVIL ENGINEERING

PROGRAMME: M.E. CONSTRUCTION ENGINEERING AND MANAGEMENT

VISION

- To attain global recognition as a Commendable centre for quality Engineering Education and Research

MISSION

- To equip the graduates to meet the sustainable development of Construction Industry for the betterment of the society.
- To provide quality education for the graduates to execute traditional and Ethical Civil Engineering Practices.
- To enable successful Professional Engineers to meet the Industrial challenges.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- Excel in research or will succeed in Construction Engineering and Management profession in the government, public and private sector organizations.
- Have a sound knowledge in statistics, project management and construction engineering fundamentals required for solving real time construction Engineering and Management problems using modern equipment and software tools.
- Become entrepreneurs and develop processes and construction technologies through innovation, by integrating their knowledge in multidisciplinary management to meet the needs of society and formulate solutions that are technically sound, economically feasible, and socially acceptable.
- Have professional and ethical attitude, effective communication skills, teamwork skills, leadership quality, multidisciplinary approach and an ability to relate Construction Engineering and Management issues in broader social context.
- Have competence of excellence, leadership, written ethical codes and guidelines, and the life-long learning needed for a successful professional career.

PROGRAM OUTCOMES (POs)

- Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- Problem analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 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.
- 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.
- 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.
- 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.
- 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.
- Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 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.
- 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.
- 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)

- In-depth knowledge in the construction management, engineering and technologies necessary to formulate, plan, schedule and execute construction projects.
- Critically analyze and solve construction engineering and management problems by applying the modern tools and concepts of Construction Engineering & Management and make innovative advances in theoretical and practical.
- Conceptualize the problems in construction industry and develop appropriate solutions which are technically feasible and economically viable with due consideration of sustainability.

COURSE OUTCOMES (COs)

Regulation	2021
Semester	01
Course Code	MA4159
Course Name	Statistical Methods For Engineers
Course Outcome	After completing this course, students should demonstrate competency in the following topics ❖ Consistency, efficiency and unbiasedness of estimators, method of maximum likelihood estimation and Central Limit Theorem. ❖ Concept of linear regression, correlation, and its applications. ❖ List the guidelines for designing experiments and recognize the key historical figures in Design of Experiments. ❖ Perform exploratory analysis of multivariate data, such as multivariate normal density, ❖ calculating descriptive statistics, testing for multivariate normality ❖ The students should have the ability to use the appropriate and relevant, fundamental and applied mathematical and statistical knowledge, methodologies and modern computational tools

Regulation	2021
Semester	01
Course Code	CN4101
Course Name	Modern Construction Materials
Course Outcome	On completion of the course, the student is expected to be able to ❖ Explain the various types of special concretes ❖ Select the different processing of steel and applications of coating ❖ Explain the manufacturing process and applications of polymer composites ❖ Identify the different flooring materials and application of façade materials ❖ Apply the knowledge of smart and intelligent materials in construction field

Regulation	2021
Semester	01
Course Code	CN4102
Course Name	Project Formulation And Appraisal
Course Outcome	On completion of the course, the student is expected to be able to ❖ Perform Formulations Of Projects ❖ Analyze Project Costing ❖ Evaluate Project Appraisal ❖ Apply Project Financing.

Regulation	2021
Semester	01
Course Code	CN4103
Course Name	Construction Equipment And Management
Course Outcome	On Completion of the course, the student is expected to be able to ❖ Develop knowledge on planning of equipment and selection of equipment ❖ Explain the knowledge on fundamentals of earth work operations, earth moving operations and types of earth work equipment ❖ Develop the knowledge on special construction equipments

	❖ Apply the knowledge on asphalt and concrete plants ❖ Apply the knowledge and select the proper materials handling equipment.

Regulation	2021
Semester	01
Course Code	CN4201
Course Name	Advanced Construction Techniques
Course Outcome	On Completion of the Course the student will be able to ❖ Understand the modern construction techniques used in the sub structure construction. ❖ Demonstrate knowledge and understanding of the principles and concepts relevant to super structure construction for buildings ❖ Understand the concepts used in the construction of special structures ❖ Knowledge on Various strengthening and repair methods for different cases ❖ Identify the suitable demolition technique for demolishing a building.

Regulation	2021	
Semester	01	Professional Elective-I
Course Code	CN4701	
Course Name	Advanced Concrete Technology	
Course Outcome	On Completion of the Course the student will be able to ❖ Develop knowledge on various materials needed for concrete manufacture ❖ Apply the rules to do mix designs for concrete by various methods ❖ Develop the methods of manufacturing of concrete ❖ Explain about various special concrete ❖ Explain various tests on fresh and hardened concrete.	

Regulation	2021
Semester	01
Course Code	ST4161

Course Name	Advanced Construction Engineering and Experimental Techniques laboratory
Course Outcome	❖ Gain practical knowledge by applying the experimental methods to correlate with the theory. ❖ Learn the usage of electrical and optical systems for various measurements. ❖ Apply the analytical techniques and graphical analysis to interpret the experimental data.

Regulation	2021
Semester	01
Course Code	CN4111
Course Name	Technical Seminar
Course Outcome	On completion of the course, the student is expected to be able to. ❖ Identify latest developments in the field of Structural Engineering ❖ Acquire technical writing abilities for seminars, conferences and journal publications ❖ Use modern tools to present the technical details.

Regulation	2021
Semester	02
Course Code	CN4201
Course Name	Advanced Construction Techniques
Course Outcome	❖ Understand the modern construction techniques used in the sub structure construction ❖ Demonstrate knowledge and understanding of the principles and concepts relevant to super structure construction for buildings ❖ Understand the concepts used in the construction of special structures ❖ Knowledge on Various strengthening and repair methods for different cases. ❖ Identify the suitable demolition technique for demolishing a building.

Regulation	2021

Semester	02
Course Code	CN4202
Course Name	Construction Planning, Scheduling And Control
Course Outcome	After completion of this course, the student is expected to be able to understand. ❖ Identify and estimate the activity in the construction ❖ Schedule the networking of activities using critical path method ❖ Evaluate the project budget required for the particular construction project ❖ Recognize the various quality control tool required in the construction industry ❖ Explain the different databases that can be maintained in a construction industry using computers

Regulation	2021
Semester	02
Course Code	CN4203
Course Name	Contract Laws and regulations
Course Outcome	On Completion of the course, the student is expected to be able to ❖ Design the construction contracts ❖ Develop a skill for the tendering process ❖ Explain the duties of the arbitrator ❖ Develop an idea on the various legal requirements to be met in relation to land and construction ❖ Identify and apply the provisions provided in the labour welfare schemes

Regulation	2021	
Semester	02	Professional Elective-II
Course Code	CN4005	
Course Name	Project Safety Management	
Course Outcome	On completion of the course, the student is expected to be able to. ❖ Develop the knowledge on accidents and their causes	

	❖ Develop the knowledge about safety programmes safety programme job-site safety assessment ❖ Apply the knowledge contractual obligations ❖ Explain about designing for safety and safety procedures ❖ Develop the knowledge owners' and designers responsibility

Regulation	2021	
Semester	02	Professional Elective-III
Course Code	CN4008	
Course Name	Resource Management And Control in Construction	
Course Outcome	On completion of the course, the student is expected to be able to. ❖ Identify the different types of resources in a construction industry ❖ Evaluate the labour productivity and the influencing factors ❖ Calculate the equipment output and its operation condition of construction equipment ❖ Describe the terms of cash inflow, cash outflow and balance sheet ❖ Categorize the time and cost related informations in a construction sector	

Regulation	2021
Semester	02
Course Code	CN4211
Course Name	Construction Management Studio Laboratory
Course Outcome	On completion of the course, the student is expected to be able to. ❖ Prepare the proposal for a construction project ❖ Schedule and Track the activities a construction project ❖ Develop a simulation model for analysing the project risk

Regulation	2021
Semester	02
Course Code	CN4212

Course Name	Statistical analysis for construction Engineers laboratory
Course Outcome	On completion of the course, the student is expected to be able to. ❖ Formulate descriptive statistics with charts and graphs using spreadsheet softwares and interpretation of results ❖ Solve Linear Programming Problems, transportation and assignment problems by appropriate techniques and evaluate the behaviour under different range of parameters ❖ Perform network analysis and decision making in project management.

Regulation	2021	
Semester	03	Professional Elective-IV
Course Code	ST4073	
Course Name	Maintenance, Repair And Rehabilitation of Structures	
Course Outcome	On completion of the course, the student is expected to be able to. ❖ Explain the importance of maintenance assessment of distressed structures ❖ Apply the knowledge on Quality assurance for concrete based on Strength and Durability ❖ Identify various repair materials and advancements in concrete ❖ Explain the knowledge on Concrete protection methods Structural health monitoring ❖ Select various strengthening and repair methods for different cases.	

Regulation	2021	
Semester	03	Professional Elective-V
Course Code	CN4013	
Course Name	Quality Control And Assurance in Construction	
Course Outcome	On completion of the course, the student is expected to be able to. ❖ Achieve the knowledge of quality management guidelines, quality circles ❖ Apply the quality standards for preparing Quality system documents ❖ Explain the skill of preparing inspection procedures for quality planning ❖ Select the techniques and tools for Quality Assurance and Control in	

	Construction Industry. ❖ Achieve the knowledge of quality improvement techniques.

Regulation	2021	
Semester	03	Open Elective
Course Code	PX4012	
Course Name	Renewable Resources Technology	
Course Outcome	❖ Ability to classify the solar energy collectors and methodologies of storing solar energy. ❖ Knowledge in applying solar energy in a useful way. ❖ Knowledge in wind energy and biomass with its economic aspects. ❖ Knowledge in capturing and applying other forms of energy sources like wind, biogas and geothermal energies.	

Regulation	2021
Semester	03
Course Code	CN4312
Course Name	Project Work I
Course Outcome	❖ Apply the knowledge gained from theoretical and practical courses in solving problems ❖ Recognize the importance of literature review ❖ Report and present the findings of the work conducted.

Regulation	2021
Semester	04
Course Code	CN4411
Course Name	Project Work II
Course Outcome	❖ Discover potential research areas in the field of Structural Engineering ❖ Apply the knowledge gained from theoretical and practical courses to be

	creative, well planned, organized and coordinated ❖ Report and present the findings of the work conducted.