**COURSE OUTCOMES**

**Department of Civil Engineering**

**M. Tech. Construction Technology & Management**

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| **S No** | **Class & Semester** | **Course & Course Code** | **COs** | **Course Outcomes** |
| 01 | M. Tech. & I-Sem | Construction Techniques (MCT6101T) | CO 1 | Understand modern construction techniques and their applications in civil engineering. |
| CO2 | Analyze the selection of appropriate construction methods based on project requirements. |
| CO3 | Apply knowledge of material properties and construction methods for structural integrity. |
| CO4 | Evaluate the efficiency of advanced construction techniques in terms of cost and sustainability. |
| CO5 | Implement safety and quality control measures in construction activities. |
| 02 | Construction Economics and Finance (MCT6102T) | CO 1 | Understand fundamental economic principles related to construction projects. |
| CO2 | Analyze financial management techniques, including cost estimation and budgeting. |
| CO3 | Apply project financing methods and risk management strategies in construction. |
| CO4 | Evaluate investment decisions and cost-benefit analysis for construction projects. |
| CO5 | Utilize economic and financial tools to optimize construction project profitability. |
| 03 | Building Information Modelling (BIM) for Construction Planning and Management (MCT6104T) | CO 1 | Understand the concepts and applications of Building Information Modelling (BIM). |
| CO2 | Analyze BIM workflows for project planning, design coordination, and construction management. |
| CO3 | Apply BIM techniques to optimize scheduling, costing, and material management. |
| CO4 | Evaluate the impact of BIM in improving project collaboration and reducing errors. |
| CO5 | Implement BIM tools in real-world construction projects for effective decision-making. |
| 04 | Building Services (MCT6105T) | CO 1 | Understand the essential building services, including electrical, plumbing, HVAC, and fire protection systems. |
| CO2 | Analyze the requirements for efficient building service integration in construction projects. |
| CO3 | Apply energy-efficient and sustainable design principles in building services. |
| CO4 | Evaluate the performance and maintenance aspects of various building services. |
| CO5 | Utilize advanced technologies for optimizing building service systems. |
| 05 | Research Methodology and IPR (MLC6101T) | CO 1 | Explain the fundamentals of research methodology. (Understanding) |
| CO2 | Apply research design techniques in problem-solving. (Applying) |
| CO3 | Analyze various intellectual property rights (IPR) policies. (Analyzing) |
| CO4 | Evaluate the impact of patents and copyrights in research. (Analyzing) |
| CO5 | Use ethical guidelines in research and publication. (Applying) |
| 06 | Disaster Management (AUD6101T) | CO 1 | Describe types and causes of disasters. (Understanding) |
| CO2 | Apply disaster risk reduction strategies. (Applying) |
| CO3 | Analyze the impact of disasters on infrastructure and society. (Analyzing) |
| CO4 | Evaluate disaster preparedness and response plans. (Analyzing) |
| CO5 | Implement mitigation strategies for disaster management. (Applying) |
| 07 | M. Tech. & II-Sem | Contract Management and Arbitration (MCT6201T) | CO 1 | Understand the fundamentals of contract law, arbitration, and dispute resolution in construction projects. |
| CO2 | Analyze various types of construction contracts and their legal implications. |
| CO3 | Apply knowledge of FIDIC, EPC, and other contract frameworks for project execution. |
| CO4 | Evaluate arbitration, mediation, and negotiation strategies in resolving contractual disputes. |
| CO5 | Implement best practices in contract administration and risk management. |
| 08 | Construction Equipment Management (MCT6202T) | CO 1 | Understand the selection, operation, and maintenance of construction equipment. |
| CO2 | Analyze cost estimation, depreciation, and economic life of construction machinery. |
| CO3 | Apply knowledge of automation and advanced technologies in construction equipment. |
| CO4 | Evaluate factors affecting equipment productivity and efficiency in construction projects. |
| CO5 | Utilize modern techniques for fleet management and resource optimization. |
| 09 | Energy Efficient Buildings (MCT6203T) | CO 1 | Understand the principles of energy efficiency and sustainability in building design. |
| CO2 | Analyze passive and active design strategies for energy-efficient buildings. |
| CO3 | Apply concepts of renewable energy integration in building services. |
| CO4 | Evaluate energy performance metrics and green building rating systems (LEED, GRIHA, BREEAM). |
| CO5 | Implement energy simulation and auditing techniques for sustainable building development. |
| 10 | Quality and Safety Management (MCT6205T) | CO 1 | Understand the importance of quality control and safety measures in construction. |
| CO2 | Analyze various quality assurance frameworks, including ISO and TQM. |
| CO3 | Apply safety standards and hazard identification techniques in construction projects. |
| CO4 | Evaluate the effectiveness of safety management systems and risk assessment methodologies. |
| CO5 | Utilize digital tools for monitoring quality and safety in construction activities. |
| 11 | English for Research Paper Writing (AUD6201T) | CO 1 | Understand the structure and components of a research paper. |
| CO2 | Develop technical writing skills and academic communication. |
| CO3 | Apply proper citation styles and ethical research writing practices. |
| CO4 | Enhance clarity, coherence, and logical flow in technical documents. |
| CO5 | Prepare and edit research papers for academic and professional publication. |
| 12 | M. Tech. & III-Sem | Construction Economics & Finance (MCTM-301) | CO 1 | Understand the fundamental concepts of construction economics and financial management. |
| CO2 | Analyze cost estimation methods, budgeting techniques, and financial planning for construction projects. |
| CO3 | Apply project financing strategies, including public-private partnerships and risk management. |
| CO4 | Evaluate investment decisions and economic feasibility of infrastructure projects. |
| CO5 | Utilize financial tools and software for construction project cost analysis and management. |
| 13 | GIS in Construction Engineering and Management (MCTM-302) | CO 1 | Understand the principles and applications of Geographic Information Systems (GIS) in construction management. |
| CO2 | Analyze spatial data for site selection, planning, and decision-making in construction projects. |
| CO3 | Apply GIS tools for project scheduling, resource allocation, and risk assessment. |
| CO4 | Evaluate GIS-based models for construction monitoring, logistics, and environmental impact assessment. |
| CO5 | Implement GIS-based solutions for improving efficiency and reliability in construction engineering and management. |