Master of Technology (Civil Engineering)

Program Outcomes (POs)

- PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
- PO3: 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.
- PO4: 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.
- PO5: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

Programme Specific Outcomes (PSO)

- ✓ PSO1: Apply construction management practices and principles to a project and lead the team for efficient project management considering economical and financial factors
- ✓ PSO2: Understand the impact of engineering solutions on environment and the need for sustainable development
- ✓ PSO3: Use the techniques, skills, advanced modern engineering tools, instrumentation and software packages necessary for engineering practice
- ✓ PSO4: Acquire competent technical knowledge to practice construction profession and develop ideas to amalgamate the existing and contemporary knowledge

Course Outcomes (COs)

2019-21 Batch

Semester	Course Code	Course Name	Course Outcomes (COs)
1	20MTCE101	Building Materials for Sustainable Development	**CO1:**Apply the various concepts of sustainable developments **CO2:**Illustrate the energy of building materials **CO3:**Examine the performance of building materials **CO4:**Select the materials for infrastructure construction **CO5:** Select the materials for sustainable flooring
1	20MTCE102	Green Technology	**CO1:** Understanding the concept of green buildings and practices **CO2:** Understanding the Green Building Opportunities And Benefits and Green Building Design **CO3:** Understanding the concept of optimal air conditioning **CO4:** Understanding the concept of Material Conservation and Indoor Environment Quality
1	20MTCE131	Demolition Methods and Cutting Edge Technology	**CO 1:** Understand the demolition work , risk and health associated components **CO 2:** Examine the planning for demolition work with cutting edge technology **CO 3:** Select sites and services related to structural elements **CO 4:** Apply the knowledge related to hazards due to demolition works **CO 5:** Illustrate the demolition methods and working constraints
1	20MTCE132	Project Management System	**CO 1:** To study and understand the concepts of Statistical methods and its applications in Engineering, **CO 2:** Will have the confidence to apply the principles of information management in any organization or project. **CO 3:** Utilize project management in terms of the software development process. **CO 4:** Become familiar with supply chain management trends **CO 5:** Students will research the methods and results surrounding the Decision Support System and related systems discussed
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1	**20MTCE133**	**Utilization of Renewable Energy Sources**	**CO 1:** Nature and applications of solar energy **CO 2:** Principles and concepts of wind and biomass energy **CO 3:** Distribution and applications of geothermal tide and wave energy **CO 4:** Concept and applications of hydel and biogas technology **CO 5:** Sources, types and production of nuclear and hydrogen energy
1	**20MTCE141**	**Modern Constructions Methods and Mechanization**	**CO 1:** Describe various latest and modern construction materials, properties and their uses **CO 2:** Identify the factors to be considered in construction of super structure and special structures and develop the construction practices and techniques. **CO 3:** Plan various construction related activities like formwork **CO 4:** To familiarize with construction equipment and their capabilities. **CO 5:** To understand the elements of equipment cost and evaluating investment alternatives.
1	**20MTCE142**	**Tunneling Technology**	**CO 1:** To apply geologic concepts and rock mechanics and approaches on engineering project **CO 2:** To Carry out geo-engineering Investigations for Rock/rock mass Characterization for tunnel projects **CO 3:** To Plan Evaluate tunnel excavation method from technical and production aspects on soft and hard rock **CO 4:** To decide appropriate services for tunnelling like ventilation, drainage and lighting **CO 5:** Plan and design tunnels in soft ground for support system, Lining and bolting
1	**20MTCE143**	**Maintenance and Rehabilitation of Structures**	**CO 1:** Describe causes, assessment and diagnose the distress in structures. **CO 2:** Assess Quality Assurance for concrete structures based on various concrete properties **CO 3:** Compare the usefulness of the various materials and techniques for Repair **CO 4:** Express the repair methods suitable to the various building components. **CO 5:** Illustrate the demolition techniques, deconstruction methods, dismantling of buildings and reuse of material
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1	**20MTCE101L**	**Construction Management Software Laboratory**	**CO 1:** Able to use software like M S Project , Google spread sheets and Primavera **CO 2:** Learn basic concept for planning and scheduling using software's. **CO 3:** Able to schedule and Plan buildings through software's. **CO 4:** Able to prepare spread sheets for estimation of a building
1	**20MTCE102L**	**Advanced Concrete Laboratory**	**CO 1:** Design high grade concrete and study the parameters affecting its performance. **CO 2:** Conduct Non Destructive Tests on existing concrete structures. **CO 3:** Apply engineering principles to understand behavior of structural/ elements.
2	**20MTCE201**	**Building Services; Plumbing, Drainage, Lifts, Escalators, and Wiring System**	**CO 1:** To understand Pipes-types, sizes and materials along with their joining details & Domestic hot and cold water supply systems **CO 2:** To know Drainage systems, gradients used in laying drains and sewers, self cleansing and non-scouring velocities for drain pipes, Rain water harvesting **CO 3:** To Understand Basic principles of sanitation, collection and conveyance of waste matter from buildings **CO 4:** To Familiar with technical terms on electrical installation and domestic wiring system **CO 5:** To capture the design considerations of mechanical air lifters like Lifts, elevators and escalators
2	**20MTCE202**	**Carbon footprint and Energy efficient Buildings**	**CO 1:** Holistic and multi-disciplinary solutions that provide optimal indoor environment in a resource-wise and economically sound manner. **CO 2:** Indoor environment - standards and recommendations, building hygiene, health and quality of life. **CO 3:** The interaction between the outdoor climate, building, energy supply and technical installation. **CO 4:** Technical installations for heating, cooling, ventilation, domestic hot water, lighting, heat recovery. **CO 5:** Control and building automation. Measurement techniques and instrumentation. **CO 6:** Select energy efficiency measures for new constructions and upgrading of existing buildings that are optimal for both economy and environment.
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2	**20MTCE231**	**Retrofitting of Buildings**	**CO 1:** Understand the fundamentals of maintenance and repair strategies. **CO 2:** Diagnose for serviceability and durability aspects of concrete. **CO 3:** Know the materials and techniques used for repair of structures. **CO 4:** Decide the appropriate repair, strengthening, rehabilitation and retrofitting technique required for a case study building. **CO 5:** Use an appropriate health monitoring and demolition techniques.
	20MTCE232	**Design of Formwork**	**CO 1:** Select proper formwork, accessories and material **CO 2:** Design the form work for Beams, Slabs, columns, Walls and Foundations. **CO 3:** Design the form work for Special Structures **CO 4:** Design the flying formwork
2	**20MTCE233**	**Heating Ventilation and Air conditioning Design (HVAC)**	**CO 1:** Students will assist in the installations of Heating, Air Conditioning and Refrigeration Equipment. **CO 2:** Perform preventive maintenance on heating and air conditioning systems. **CO 3:** Students will identify site hazards. **CO 4:** The student shall understand the principles and working HVAC systems. **CO 5:** To be able to study and analyse psychometric chart in refrigeration systems. Develop problem solving skills through the application of thermodynamics.
2	**20TCE241**	**Global Warming and Cooling**	**CO 1:** Understand the physical basis of the natural greenhouse effect, including the meaning of the term radioactive forcing **CO 2:** Know something of the way various human activities are increasing emissions of the natural greenhouse gases, and are also contributing to sulphate aerosols in the troposphere **CO 3:** Demonstrate an awareness of the difficulties involved in the detection of any unusual global warming 'signal' above the 'background noise' of natural variability in the Earth's climate and of attributing (in whole or in part) any such signal to human activity **CO 4:** Understand that although a growing scientific consensus has become established through the IPCC, the complexities and uncertainties of the science provide opportunity for climate skeptics to challenge the Panel's findings
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2	**20TCE242**	**Infrastructure Valuation**	**CO 1:** Understand the fundamentals of Value, worth and value engineering and also understand the general techniques in infraction valuation. **CO 2:** Gain knowledge on the various special techniques in infrastructure valuation. **CO 3:** Understand the different numeric analysis techniques in value engineering and study life cycle cost. **CO 4:** Recognize the applications of value engineering
2	**20TCE243**	**Tropical Housing and Buildings**	**CO 1:** A brief introduction to the global climate, components of climate, elements of climate and their **CO 2:** Relevance of site and local climate in the design of built form, micro, macro and crypto climate, Study of urban and rural climate, Human heat balance and comfort, heat flow through buildings, **CO 3:** Climate and Design of Buildings in Tropical Climates, Tropical climates and Climatic zones of India, classification, characteristics and design considerations. **CO 4:** Students will learn how to analyze climatic factors in relation to the human comfort. **CO 5:** Students will also learn how to implement climatic factors in the architectural design
2	**20MTCE203L**	**Quality & Safety Management in Construction**	**CO 1:** Comprehend concepts of quality management, system requirements and documentation. **CO 2:** Identify with quality planning and programs in construction industry. **CO 3:** Understand objectives, techniques for testing and analysis and application of tools for improvement of quality **CO 4:** Value the fundamentals of safety management systems in construction industry **CO 5:** Demonstrate procedures and quality assurance systems and safety management systems in construction projects
2	**20MTCE204L**	**Tender & specification preparation Field work**	**CO 1:** To Prepare tender notices and tender documents. **CO 2:** To Prepare a quantitative comparative statement and bidding process in tendering **CO 3:** To create various forms of tendering **CO 4:** To prepare detailed specifications and general specifications for buildings
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2	**20MTCE205**	**Mini Project**	**CO 1:** Identify structural engineering problems reviewing available literature. **CO 2:** Study different techniques used to analyse complex structural systems. **CO 3:** Work on the solutions given and present solution by using his/her technique applying engineering principles.
3	**20MTCE331**	**Building Rating Systems with Case Studies**	**CO 1:** Students will be able to build different types of rating system(GRIHA, LEED) **CO 2:** Students will build Green buildings (economic case) to save money through reduced energy and water consumption and lower long-term operations and maintenance costs. **CO 3:** Case study of rating of commercial complexes, students will able to build green building in further projects
3	**20MTCE332**	**Water Conservation Practices in Buildings**	**CO 1:** Common water conservation technologies and its maintenance **CO 2:** Rooftop rainwater harvesting design for a building **CO 3:** Storm water management practices in commercial and industrial building **CO 4:** Subsurface recharge structures construction and maintenance **CO 5:** Case studies on RWH and Legislation on RWH
3	**20MTCE333**	**Underwater Construction**	**CO 1:** Describe the underground construction like Tunneling, Soil excavation and Compaction Technology. **CO 2:** Solve underwater excavation using Vacuum Dewatering and Well point system. **CO 3:** Examine the details, design and Construction of pneumatic and precast caissons. **CO 4:** Examine the Concrete mix design with various methods of underwater concreting **CO 5:** Design the single wall and double wall Coffer Dams.