

Nirma University
Institute of Technology
School of Engineering
Civil Engineering Department

M.Tech - Civil Engineering (CTM)

Course Code: 3CL3101

Course Title: Construction Project Planning, Scheduling and Controlling

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. identify the need of project planning, feasibility study and organisational structure (BL3)
2. choose scheduling techniques to manage construction project (BL5)
3. discover the need of resource allocation and time-cost trade-off (BL4)
4. make use of construction project monitoring & controlling techniques. (BL3)

Course Code: 3CL3102

Course Title: Advanced Construction Technology

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. apply advanced construction techniques for high rise building (BL3)
2. select most appropriate techniques for underground construction (BL5)
3. choose the appropriate techniques for bridge, road and offshore construction (BL3)
4. adapt the pre-cast & prefabricated technology (BL6)
5. examine techniques for ground improvement and demolition of structures. (BL4)

Course Code: 3CL3103

Course Title: Contract Management

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. develop contract documents for construction project (BL3)

2. appraise the need of contract law (BL5)
3. discover the need of international contract (BL4)
4. examine construction claims and suggest dispute resolution techniques. (BL4)

Course Code: 3CL3104

Course Title: Minor Project I

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. apply construction planning and management practices (BL3)
2. identify the problem and propose the solution to mitigate the same (BL3)
3. build report and present before the peers. (BL6)

Course Code: 3CL3105

Course Title: Construction Practice Studio

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. develop the knowledge of construction management procedures (BL3)
2. propose planning of construction activities (BL6)
3. solve problems in construction practice by applying engineering & management skills. (BL3)

Course Code: 3SP1101

Course Title: Communication Skills and Technical Writing

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. develop verbal and non-verbal communication skills (BL3)
2. apply speaking skills for group discussion, personal interview and seminar presentation (BL3)
3. develop skills of preparing technical material, research paper and dissertation. (BL3)

Course Code: 3CL3201

Course Title: Equipment & Material Management

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. choose the most appropriate plants and equipment for construction projects (BL5)
2. plan and manage the use of equipment for construction activities (BL3)
3. examine various aspects of material management (BL4)
4. identify scientific methods of inventory management. (BL3)

Course Code: 3CL3202

Course Title: Construction Economics

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. apply the economic principles for construction projects (BL3)
2. appraise the effect of depreciation, taxation & inflation (BL5)
3. evaluate the cost-benefit ratio for construction projects (BL5)
4. select the most economical alternative for construction projects. (BL3)

Course Code: 3CL3203

Course Title: Computer Applications in Construction Project Management

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. make use of software for planning, monitoring and controlling construction projects (BL3)
2. appraise the use of software for resource allocation. (BL5)

Course Code: 3CL3204

Course Title: Minor Project II

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. identify issues related to safety, health, environment and quality for construction projects (BL3)

2. analyze the cost of the construction projects (BL4)
3. select appropriate principles to manage resources for construction projects (BL5)
4. build report and present before the peers. (BL6)

Course Code: 3SS1201

Course Title: Research Methodology and IPR

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. appraise data collection methods and tools; and research methodology (BL5)
2. organize research related information and plan for research problem formulation (BL3)
3. develop research writing skills; and practice research ethics (BL3)
4. contrast research outcomes suitable for publications or IPR (BL4)
5. infer the basic IPR needs, protections, law, process and trends in IPR (BL2)

Course Code: 3CL3301

Course Title: Major Project Part I (Full Time)

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. identify domain of project related to construction technology & management (BL3)
2. examine appropriate literature and decide the objectives & scope of the project work (BL4)
3. build report and present before peers. (BL6)

Course Code: 3CL3401

Course Title: Major Project Part II (Full Time)

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. develop analytical approach and/or experimental program to solve identified problem (BL3)
2. choose appropriate solution for the identified problem. (BL5)

3. build report and present before peers. (BL6)

Course Code: 3CL3DE001

Course Title: Quantitative Techniques in Management

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. solve the deterministic optimization problems (BL3)
2. categorize risk and uncertainty in construction projects (BL4)
3. apply optimization techniques for decision making under uncertainty (BL3)
4. justify the use of simulation techniques in construction projects. (BL5)

Course Code: 3CL3DE002

Course Title: Infrastructure Project Development and Management

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. apply concept of-infrastructure risk management strategies (BL3)
2. analyze urban and rural infrastructure based on policy requirements (BL4)
3. examine the public-private participation for infrastructure projects (BL4)
4. propose maintenance plan for infrastructure projects. (BL6)

Course Code: 3CL3DE003

Course Title: Building Automation and Smart City Planning

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. identify the need of building automation and energy efficient design (BL3)
2. make use of various control systems in building (BL3)
3. plan and develop sustainable smart cities (BL6)

Course Code: 3CL3DE004

Course Title: Real Estate Development and Management

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. examine the process involved in real estate management (BL4)
2. discover the need of urban land policy (BL4)
3. identify the role of various stake holders in real estate development (BL3)
4. compare the global real estate with Indian scenario (BL5)
5. estimate the value of civil engineering structures. (BL5)

Course Code: 3CL3DE005

Course Title: Safety, Health and Quality Management for Construction Projects

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. identify accident pattern and its effect on construction projects (BL3)
2. choose safety management practices for construction projects (BL3)
3. discover the need of quality assurance, quality control and total quality management (BL4)
4. decide quality management practices for construction projects. (BL5)

Course Code: 3CL3DE006

Course Title: Human Resource Management and Organizational Behaviour

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. identify the need of human resource management for infrastructure (BL3)
2. take part in training and development practices for various personnel (BL4)
3. evaluate the performance of various personnel by implementing methods and motivation theory (BL5)
4. develop organizational structure for project. (BL6)

Course Code: 3CL3DE007

Course Title: Value Engineering

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. discover the importance of value engineering related to construction projects (BL4)
2. appraise the concept of life cycle costing for construction projects (BL5)
3. select appropriate value engineering methodology for construction projects. (BL5)

Course Code: 3CL3DE008

Course Title: Insurance & Risk Management for Construction Projects

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. develop understanding of the types of risks involved in construction projects (BL3)
2. analyze the risk and implement the risk response planning & strategies (BL4)
3. propose risk mitigation strategy for construction projects (BL6)
4. assess the principles and practices of insurance in construction projects. (BL5)

Course Code: 3CL3DE009

Course Title: Sustainable Construction Technologies and Management

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. apply concepts of sustainable development and rating systems (BL3)
2. analyze building materials and technologies for sustainable construction (BL4)
3. discover concepts of sustainable construction management (BL4)
4. appraise strategies for resource conservation and waste management. (BL5)

Course Code: 3CL3DE010

Course Title: Advances in Construction Materials

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. evaluate performance and sustainability requirements of construction materials (BL5)
2. select relevant building materials for application in construction activities (BL3)

3. discover use of polymers, architectural and smart materials in construction industry (BL4)
4. recommend appropriate type of cementitious material, chemical admixture and concrete type for using in construction field (BL5)

Course Code: 3CL3DE011

Course Title: Business Strategies and Corporate Planning

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. apply the concepts of business strategies and corporate planning (BL3)
2. examine the business strategies and choose most appropriate alternative (BL4)
3. identify need of corporate governance (BL3)
4. develop appropriate business strategy for corporate governance. (BL6)

Course Code: 3CL3DE012

Course Title: Environmental Impact Assessment for Construction Projects

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. identify legal and regulatory aspects of environmental impact assessment (BL3)
2. take part in environment impact & life cycle assessment (BL4)
3. plan environmental impact management (BL3)
4. evaluate the report of environmental impact assessment (BL5)

Course Code: 3CL3DE201

Course Title: Finance & Account Management

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. identify the cash flow diagrams and change in working capital (BL3)
2. compare the financial performance of the company (BL4)
3. discover the need of the accounting principle (BL4)

4. assess the international financial market (BL5)

Course Code: 3CL3DE202

Course Title: BIM and Lean Construction

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. identify the need of BIM in construction management (BL3)
2. examine BIM models for construction projects (BL4)
3. appraise the need of lean philosophy for construction projects (BL5)
4. propose integrated project delivery system incorporating BIM and lean principles. (BL6)

Course Code: 3CL3DE203

Course Title: Formwork for Civil Engineering Structures

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. identify the importance of formwork design in construction (BL3)
2. list appropriate materials for formwork (BL4)
3. appraise the appropriate formwork for different building components (BL5)
4. propose appropriate formwork technique for different structures. (BL6)

Course Code: 3CL3DE204

Course Title: AI and ML in Construction Projects

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. identify the need of AI and ML for construction projects (BL3)
2. examine the concepts of AI and ML for construction projects (BL4)
3. justify the application of the concepts of ANN & deep learning for construction projects. (BL5)

Course Code: 3CL3DE205

Course Title: Building Systems and Services

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. choose appropriate water and drainage system in buildings (BL3)
2. apply electrical and lighting system in buildings (BL3)
3. estimate appropriate systems for vertical transportation and HVAC in buildings (BL5)
4. list appropriate safety and security systems in buildings. (BL4)

Course Code: 3CL3DE206

Course Title: Construction Maintenance and Rehabilitation

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. identify factors affecting durability and compatibility of concrete (BL3)
2. examine aspects related to maintenance of structures (BL4)
3. choose appropriate materials and techniques for repair and strengthening of structures. (BL5)

Course Code: 3CL3DE207

Course Title: Applications of Geo-Informatics in Construction

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. identify the need of cartography & geodesy (BL3)
2. discover use of remote sensing technology for construction project (BL4)
3. categorize the services of Global Navigation Satellite System (GNSS) (BL4)
4. justify the use of Geographical Information Systems (GIS) for preparation of maps. (BL5)

Course Code: 3CL3DE208

Course Title: Functional Design of Buildings

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. identify the elements of climate for design of buildings (BL3)
2. explain effect of thermal and wind aspects on design of buildings (BL5)
3. determine suitable lighting and sound insulation systems for buildings. (BL5)

Course Code: 3CL3DE209

Course Title: Advances in Geotechnical Engineering

Course Learning Outcomes (CLOs):

At the end of the course, the students will be able to –

1. make use of in-situ soil properties for analysis and design of foundations (BL3)
2. categorize the ground improvement techniques used in practice (BL4)
3. identify types & sources of subsurface contamination and recommend control (BL3)
measures
4. assess the properties of soil for transportation infrastructure applications. (BL5)