

Module Synopsis – Advanced Diploma in Construction Engineering

Construction Safety (45 hrs)

To familiarize students with the safety and health hazards in the construction industry and be able to implement and audit the Safety Management System. It also provides students with knowledge of how to supervise the construction, erection, alteration or dismantling of any formwork structure within a worksite setting.

Assessment Weightage: 30% Group Presentation(s) | 30% Field Work | 40% Exam

Building Services (45 hrs)

This module covers broad fundamentals of building services design and the function of services in commercial buildings and their importance to the core business in areas of electrical services, lighting, heating, ventilation and air conditioning, lifts and water.

Assessment Weightage: 20 % Individual Assessment/tutorial | 20% Field Work | 60% Exam

Civil and Construction Engineering Materials (45 hrs)

To provide an introductory overview of the various materials used in civil and construction engineering and their fundamental principles of structural, physical and long-term performance. At the end of the course, students able to understand various civil and construction engineering material applications and detailing in structural and non-structural building components. Students will gain a comparative knowledge of material properties and possible applications in construction and architecture.

Assessment Weightage: 20% Group Presentation(s) | 20% Field Work | 60% Exam

Earth Systems (45 hrs)

This module introduces to the nature of Earth science, its processes and its relationship to other scientific fields. Earth science utilizes a systems approach to the dynamic nature of Earth while at the same time retaining a uniqueness unlike other sciences. The formation of the universe, solar system, and planet are key to understanding of the processes that shape planet Earth. Earth as a sphere and a subset of four interacting spheres also plays a key role in understanding our planet.

Assessment Weightage: 20 % Individual Assessment/tutorial | 20% Group Presentation | 60% Exam

Construction Management Systems (45 hrs)

To provide students with knowledge of the various forms of project delivery methods (Design-Bid-Build, Design-Build, and Construction Management) and the underlying principles for choosing the appropriate system. Students will learn to recognize the complexity of the pre-construction process including conceptual estimating and scheduling, life cycle costing, constructability

reviews, value engineering, risk management and special contract requirements.

Assessment Weightage: 20 % Individual Assessment/tutorial | 20% Group Presentation | 60% Exam

Construction Project Management (45 hrs)

To provide students with the knowledge of principles of project management and their applications in construction projects. Techniques in managing construction projects will be taught including project planning, cash flow analysis, Gantt chart, and critical path methods using network diagrams.

Assessment Weightage: 30% Group Presentation(s) | 30% Business Report/ Case Studies | 40% Exam

Technical Drawings & Structural Detailing (45 hrs)

Students will learn the basics of technical drawing (sketching/scaling, basic CAD/computer skills, lettering and line work, math as it relates to drawing, architecture, orthographic projection, dimensioning, pictorial drawings, advanced CAD skills, etc.) through a series of projects / assignments.

Assessment weighting: Coursework assignments - 100%

Structural Analysis (45 hrs)

To provide students with an introduction to structural systems and basic analysis methods for beams, frames, and trusses. Topics covered include the analysis of statically determinate and indeterminate structures, deflection calculations, influence lines, and an introduction to the stiffness method.

Assessment Weightage: 20 % Individual Assessment/tutorial | 20% Group Presentation | 60% Exam

Structural Mechanics (45 hrs)

To provide student with knowledge of structural forms and their characteristics, including axial and bending action in resisting external forces, develop models and solve straightforward problems in structures, including simple trusses, beams and frames, and determine the internal forces in statically determinate structures, the stresses within simple elements and cross- sections, deflections in simple beams.

Assessment Weightage: 20 % Individual Assessment/tutorial | 20% Class Test | 60% Exam

Technopreneurship (45 hrs)

This course provides an overview of technopreneurial activity, including evaluation and planning of a new business, financing, team building, product development, marketing and operational management issues, intellectual property protection, alternative models for revenue and growth, and exit strategies.

Assessment Weightage: 60 % Individual Assessment/tutorial | 40% Group Presentation

Reinforced Concrete Design (45 hrs)

To provide students with an understanding of the structural design process, the mechanics of reinforced concrete, and the ability to design and proportion structural concrete members including slabs, beams, and columns for strength, serviceability, and economy. Design procedures are based on Eurocode 2 standards.

Assessment Weightage: 20 % Individual Assessment/tutorial | 20% Group Presentation | 60% Exam

Engineering Mathematics 1 (45 hrs)

To provide students with the knowledge of limits, continuity, differentiation, applications, definition of the integral, and fundamental theorem of integral calculus.

Assessment Weightage: 20 % Individual Assessment/tutorial | 40% Class Test | 40% Exam

Engineering Mathematics 2 (45 hrs)

To provide students with the knowledge to apply integration, differentiation, and integration of transcendental functions and methods of integration, L'Hopital's rule, conic sections, parametric equations, polar coordinates, infinite series.

Assessment Weightage: 20 % Individual Assessment/tutorial | 40% Class Test | 40% Exam

Transportation Engineering and Design (45 hrs)

This course introduces students to methods and underlying principles for the design and control of the elements of road and railway infrastructure. Students also become familiar with transportation system terminology, flow analysis, driver, vehicle and road characteristics, and aspects of road geometrics, road construction, drainage, pavements and maintenance.

Assessment Weightage: 20 % Individual Assessment/tutorial | 20% Group Presentation | 60% Exam

Sustainable Engineering Practice (45 hrs)

This course introduces students to professional skills that are integral to an engineering workplace. The focus is on integrating professional skills with technical skills. Students will be asked to apply their theoretical learning to engineering-based assessments. The course will also introduce students to sustainability and 'Green' engineering concepts.

Assessment Weightage: 60 % Individual Assessment/tutorial | 40% Group Presentation

Industrial Attachment*/Integrated Project (6-mth)

The aim of the industrial attachment is to foster professionalism in student development by placing them in real-world working environment within the context of the industry to develop further their practical skills. This is to bring out the some theoretical underpinnings of the classroom context to a demonstration of their understanding and applications to the dynamic industry. Students are

expected to be placed in Construction Engineering traineeship position in establishments in the industry to meet the internship criteria for a period of six months.

Assessment weighting: Coursework assignments - 100%

* Industrial Attachment (IA)

- **Student is entitled to only one Industrial Attachment posting; and**
- **No further IA posting will be arranged if the student withdraws or is terminated by the IA training partner.**
- **In the event where student could not be placed as traineeship (IA); due to various reason, he/she will do an integrated project with guidance from NIM IA Lecturer or an appointed member of the academic staff.**