

Module Objectives

English & Communication: Workplace Interaction

On completion of the module, students are expected to be able to handle suggestions, offers, preference and persuasion in oral interactions involving predictable information, ideas, related explanations, discussion/argument, and evaluation. This should be evidenced by students' ability to:

- participate effectively in discussions/meetings/negotiations/ with colleagues/clients on workplace topics/issues;
- make and respond to suggestions, offers, preference and persuasion by giving opinions with justification appropriately;
- initiate and handle interruptions and clarifications effectively; and
- demonstrate a reasonable level of accuracy in using increasingly complex grammatical structures involving a wide variety of verb forms, tenses, modals and discourse markers.

English & Communication: Workplace Correspondence

On completion of the module, students are expected to be able to handle problems in incoming written correspondence involving predictable information, ideas, related explanations, discussion/argument, and evaluation. This should be evidenced by students' ability to:

- read for main ideas and extract relevant information from workplace documents for handling specific problems;
- handle problems such as complaints from colleagues and customers by explaining causes of problems, empathising with the reader, offering advice and evaluating solutions to problems;
- deal with acceptance and refusal of responsibilities in different workplace situations;
- adopt a diplomatic tone and express goodwill; and
- demonstrate a reasonable level of accuracy in using increasingly complex grammatical structures involving a wide variety of verb forms, tenses, modals and discourse markers.

English and Communication: Promotional Materials

On completion of the module, students are expected to be able to express persuasion and emotion when presenting information, ideas, related explanations, discussion/argument, and evaluation in written form. This should be evidenced by students' ability to:

- express persuasion and emotion effectively when promoting products/services/projects/events;
- handle information effectively when promoting oneself in work-related contexts
- discuss readers' specific problems/needs in proposals;
- present tactful explanations and discussion/argument with subtlety and sensitivity when proposing response(s)/solution(s);
- write persuasively through suitable and sensitive evaluation of information and the conclusions drawn from it;
- adopt an appropriate register and style for different types of persuasive writing; and
- demonstrate a reasonable level of accuracy in using complex grammatical structures involving all verb forms, tenses, modals and discourse markers and a growing range of alternative constructions that reflect variations in register.

English and Communication: Reports

On completion of the module, students are expected to be able to express suggestions when presenting information, ideas, related explanations, discussion/argument, and evaluation in written form. This should be evidenced by students' ability to:

- state the background and establish the purpose of a report precisely;
- analyse, synthesise and evaluate information in the findings and discussion sections critically;
- express suggestions and recommendations persuasively, stating their resulting benefits through appropriate and tactful explanation and argument;
- draw conclusions logically from findings through appropriate and sensitive evaluation of information; and
- demonstrate a reasonable level of accuracy in using complex grammatical structures involving all verb forms, tenses, modals and discourse markers, and a growing range of alternative constructions that reflect variations in register.

English and Communication: Persuasive Presentations

On completion of the module, students are expected to be able to express compliments, persuasion and emotion in oral presentations of information, ideas, related explanations, discussion/argument, and evaluation. This should be evidenced by students' ability to:

- discuss audiences' specific problem(s)/need(s);
- express compliments and emotion, and use persuasive language with tact and subtlety;
- express sensitive evaluation of the resulting anticipated benefits of the proposed recommendations;
- speak persuasively and confidently through appropriate and tactful explanations and discussion/argument when proposing a solution/an idea; and
- demonstrate a reasonable level of accuracy in using complex grammatical structures involving all verb forms, tenses, modals and discourse markers and a growing range of alternative constructions that reflect variations in register.

Information Technology Essentials - Smart Living

On completion of the module, students should be able to:

- apply basic emerging digital knowledge and skills to solve problems in workplace and daily life;
- demonstrate awareness and knowledge of cybersecurity and digital ethics when accessing the internet and information systems;
- use appropriate tools/software to interactively control the smart/sensors devices for smart living;
- apply business intelligence tools to extract big data from external sources, transform and visualize in different formats to produce insight;
- build different types of artificial intelligence applications through cloud platforms; and
- use appropriate tools/software to produce content for immersive experiences.

Industrial Training for Civil Engineering

On completion of the module, students should be able to:

- recognise the basic techniques relevant to falsework construction;
- apply the basic skills relevant to formwork and reinforcing bars fixing;
- recognise the elementary skills relevant to non-destructive testing; and
- assess the potential hazards and safety measures on construction sites

Construction Drawing and Computer Aided Drafting

On completion of the module, students should be able to:

- present construction drawings in general practice and purposes; and
- acquire basic skills to handle computer aided drafting as a platform for creating construction drawings.

Construction Technology

On completion of the module, students should be able to:

- recognize basic structural elements of R.C. buildings, their construction methods and prepare the relative construction drawings;
- recognize earthwork, various types of basic substructures, foundation, excavation and lateral support (ELS) system, their construction methods and prepare the relative method statements;
- recognize the applications of precast concrete units, Modular Integrated Construction (MiC), their production techniques and prepare the connection detail drawings;
- realize the fabrication and assembly techniques structure steelwork, curtain wall and fabric structure construction;
- acquire and apply the knowledge of pre-stressed concrete in building and civil engineering works; and
- develop knowledge of infrastructure construction, including bridge and tunnel

Construction Contract and Administration

On completion of the module, students should be able to:

- demonstrate the knowledge of basic contract law and understand the various roles of participants in construction contract;
- acquire the knowledge of various types of contractual arrangement and distinguish the usage of each type in construction work;
- acquire the knowledge of the tendering procedure and the parties in the process;
- acquire the knowledge and understanding of the contract administration procedures for valuation of interim payment, variation, issuing of certificates, settlement of final account, claims, and other methods in alternative dispute resolution;
- demonstrate the knowledge and understanding of the law of tort.

Engineering Science for Construction A

On completion of the module, students should be able to:

- recognize the fundamental concepts of structural mechanics, dynamic vectors, and fluid mechanics together with their applications to construction industry;
- apply the fundamental principles of modulus of elasticity and the related knowledge in material science to solve civil engineering problems; and
- examine different forms of energy transformation and their applications.

Engineering Mathematics for Construction

On completion of the module, students should be able to:

- manipulate a range of mathematical skills in solving equations involving commonly occurring functions;
- find the derivatives, locate and classify stationary points, and determine optimal values of a function of one variable;
- find definite and indefinite integrals using substitutions, partial fractions and integration by parts; and
- apply the mathematical techniques in solving standard engineering problems in construction discipline.

Structural Mechanics

On completion of the module, students should be able to:

- apply the basic knowledge and concepts of the fundamental principles of structural mechanics;
- determine the mechanical properties of arbitrary cross sections;
- analyse statically determinate plane trusses subjected to point loads;
- analyse statically determinate beams subjected to vertical loads;
- recognize the concepts of stress and strain in a structural element;
- demonstrate the knowledge of stress distribution in beams subjected to external forces; and
- apply the basic knowledge and concepts of the theory of torsional shear stress of circular sections.

Engineering Surveying

On completion of the module, students should be able to:

- demonstrate a detailed understanding of the principles of land surveying in Civil Engineering Construction;
- demonstrate the ability to use a range of instruments pertinent to the land surveying;
- acquire knowledge of cartographic detailing and generation of survey plans and engineering drawings;
- describe the use of modern survey methods and instruments in the construction industry; and
- apply computer knowledge to calculate and produce surveying solutions to setting out.

Design for Manufacturing and Assembly

On completion of the module, students should be able to:

- develop knowledge of different methods of construction viz traditional, semi-precast, PPVC; develop knowledge in the structural design and detailing of PPVCs;
- develop knowledge on PPVC production;
- recognize the impacts of DfMA on Architect, Contractor, M & E Engineer, C & S Engineer; and
- develop knowledge on procedures of managing quality control.

Building Information Modelling for Construction

On completion of the module, students should be able to:

- develop knowledge on Building Information Modelling (BIM) concept, initiation, local & global contexts, standard, guidelines, software and latest technologies and their application;
- apply construction documentation, quality control, 3D visualization and rendering;
- create BIM models by applying modern drafting techniques; and
- construct structural elements in BIM models.

Whole Person Development - Enhancing Competencies in the 21st Century Workplace

On completion of the module, students should be able to:

- select appropriate personal strategies for career development;
- illustrate one's lifelong learning skills to prepare for the challenges in workplace; and
- exercise responsible judgement and action with appropriate work ethics and workplace etiquette in a specific trade.

Material and Concrete Technology

On completion of the module, students should be able to:

- demonstrate the performance and properties of major construction materials;
- perform concrete mix design for civil engineering works;
- conduct quality control testing for major construction materials; and
- consider environmental factors in the application of major construction materials.

Soil Mechanics and Geology

On completion of the module, students should be able to:

- perform description and classification of engineering soil, and the determination of their index properties;
- demonstrate the understanding of the importance of underground water flow in soil engineering and employ graphical technique to model underground water flow for two-dimensional structures;
- evaluate the stress distribution within a soil mass for simple external loading conditions;
- describe the principles and methods of site investigation;
- identify common rock forming minerals, common rock types and their mode of formation;
- recognize basic land forms, carry out rock structure mapping, and apply descriptive

- geometry techniques to analyze planar rock structures;
- perform soil index tests and analyze the test results to draw engineering conclusion.

Structural Analysis

On completion of the module, students should be able to:

- apply equilibrium equations and free-body diagrams to determine the support reactions and internal forces of determinate beams and frames;
- construct the axial force diagrams, shear force diagrams and bending moment diagrams for determinate beams and frames;
- develop knowledge and skills in both moment distribution method;
- analyse performance of short and long columns subjected to eccentric load and / or concentric load respectively; and
- comprehend Mohr's Circle for stress analysis in structural elements.

Reinforced Concrete Design

On completion of the module, students should be able to:

- develop the basic concepts of limit state design in RC structures;
- apply the Ultimate Limit State and Serviceability Limit State Principles to reinforced concrete beam design in accordance with Code of Practice for the Structural Use of Concrete 2013;
- apply the Ultimate Limit State and Serviceability Limit State Principles to reinforced concrete slab design in accordance with Code of Practice for the Structural Use of Concrete 2013;
- apply the Ultimate Limit State and Serviceability Limit State Principles design methods to reinforced concrete column and wall design in accordance with Code of Practice for the Structural Use of Concrete 2013; and
- apply the Ultimate Limit State and Serviceability Limit State Principles design methods to simple substructures design in accordance with Code of Practice for the Structural Use of Concrete 2013.

Sustainability and Engineering Profession

On completion of the module, students should be able to:

- identify and diagnose conflict between sustainability issues and human development activities which facing in the society;
- outline the engineering solution to solve those sustainability issues;
- explain professional practice of an Engineer in engineering development project; and
- illustrate the competences, responsibility and ethics of professional engineering team includes technicians, technologists and engineers.

Project Implementation of BIM Technology

On completion of the module, students should be able to:

- understand Building Information Modelling (BIM) use and process in various project stages;
- understand building systems for building project coordination and incorporation to BIM;
- administer BIM project at different project stages and execute BIM uses for single and

- multi-disciplinary coordination of combined services system in BIM project; and
- integrate multiple parties into a cohesive BIM project through management, collaboration and integration of digital information.

Construction Management

On completion of the module, students should be able to:

- demonstrate the understanding of the basic knowledge of management process and organization theories;
- contrast various types of construction programmes and apply the knowledge of project programming and scheduling techniques in construction projects;
- comprehend the structure of site organization and identify appropriate resources required for site establishment and site layout planning;
- articulate the basic concepts of quality, safety and environmental systems; and
- recognize the importance of ethics in the professional arena and develop an awareness of the implication of bribery prevention in the construction industry.

Structural Detailing

On completion of the module, students should be able to:

- present technical construction drawings by applying drafting techniques;
- apply judicious use of computer-aided drafting to flesh out structural engineering drawings;
- act as intermediary between structural design and practice working environments; and
- be perspicacious in structural engineering systems and details

Steelwork Design

On completion of the module, students should be able to:

- develop limit state design philosophy for structural steelwork design;
- apply ultimate limited state design methods for simple structural steelwork connections;
- apply ultimate limited state and serviceability limited state design methods for simply supported structural steel beams; and
- apply ultimate limited state design methods for structural steel columns in both simple and continuous construction.

Geotechnical and Foundation Engineering

On completion of the module, students should be able to:

- evaluate the shear strength parameters and determine the shear strength of soil;
- determine the lateral earth pressure and thrust developed in soil;
- acquire the knowledge of stability analysis of soil slope;
- evaluate the compressibility of soil using one dimensional consolidation theory;
- determine the immediate and consolidation settlement of foundations; and
- determine the ultimate and allowable bearing capacity of shallow and deep foundations.

Temporary Works

On completion of the module, students should be able to:

- review the general role of temporary works in execution of permanent works in relation to the associated contractual and local legal requirements during various stages of the construction works;
- acquire a knowledge of common access scaffolding system available in local construction industry for different working purposes and the related safety requirements;
- apply engineering principles in designing formwork erected for structural concrete construction with due considerations for different construction conditions and site constraints
- apply engineering principles in designing and checking falsework works erected in construction sites with due considerations for different construction conditions and site constraints;
- develop a knowledge of different types of cofferdam installing for various civil engineering works, and apply geotechnical principles in design of steel sheet piling works; and
- develop a knowledge of shoring works in providing temporary support to existing structures and trench excavation works with due considerations to possible construction hazards which could arise.

Advanced Structural Analysis with Computer Applications

On completion of the module, students should be able to:

- develop knowledge in Energy Methods and application in deflections calculation of simple structures by Energy Methods;
- develop knowledge of the underlying principles of the Method of Consistent Deformation and its application in analyzing indeterminate beams; verify results using structural analysis software;
- develop knowledge in Stiffness Method in analyzing indeterminate beams and frames; using structural analysis software to verify the results.
- apply the Qualitative Analysis of beams and frames; and
- develop knowledge and skill in approximate methods and computer method for structural analysis.

Industry Based Student Project

On completion of the module, students should be able to:

- integrate and apply knowledge including engineering-related and science-related, techniques, skills and modern tools learned in the programme to conduct activities and construct the engineering project with professional and ethical responsibilities;
- identify, analyze and solve the “broadly-defined” engineering or technology problems with design or related solutions, in environmental and sustainable impacts as appropriate, through different stages of development;
- apply relevant project management skills to undertake and manage the project effectively and with quality while developing appropriate personal attributes or non-cognitive skills including self-discipline, commitment, motivation, integrity, timeliness and continuous improvement through carrying out the project tasks individually and as a team member; and
- communicate effectively in formal written reports and oral presentation with modern tools and media to explain the engineering project

Further Mathematics for Construction

On completion of the module, students should be able to:

- apply vector mathematics to common engineering problems;
- apply matrix algebra by solving algebraic equations and eigenvalue analysis in common engineering problems; and
- define engineering problems using differential equations and solve ordinary differential equations in general engineering problems.