

## EXTENDED HIGHER DIPLOMA IN

# CIVIL ENGINEERING

LEVEL 4 & LEVEL 5

Design Today. Build a Better Tomorrow.



## QUALIFICATION STRUCTURE

240 Credits | 12 Units | Level 4: 120 Credits | Level 5: 120 Credits

### LEVEL 4 - CIVIL ENGINEERING

120 CREDITS | 6 UNITS x 20 CREDITS

- 1 Engineering Mathematics and Applied Mechanics
- 2 Civil Engineering Materials and Construction Technology
- 3 Surveying, Measurement and Site Engineering
- 4 Structural Mechanics and Principles of Structural Design
- 5 Geotechnical Engineering and Soil Mechanics
- 6 Civil Engineering Drawing, CAD and Digital Applications

### LEVEL 5 - CIVIL ENGINEERING

120 CREDITS | 6 UNITS x 20 CREDITS

- 1 Advanced Structural Analysis and Design
- 2 Advanced Geotechnical Engineering and Foundation Design
- 3 Highway and Transportation Engineering
- 4 Hydraulics, Water Resources and Environmental Engineering
- 5 Civil Engineering Project and Construction Management
- 6 Sustainable Infrastructure Design and Civil Engineering Project

240

TOTAL CREDITS

12

UNITS

20

CREDITS / UNIT

4 & 5

LEVELS

## PROGRAMME CONTENT & LEARNING FOCUS

### LEVEL 4 - 120 CREDITS

#### 1. Engineering Mathematics and Applied Mechanics

- Algebra, trigonometry, calculus and statistics
- Forces, moments, equilibrium and dynamics
- Stress, strain and engineering problem-solving

#### 2. Civil Engineering Materials and Construction Technology

- Concrete, steel, timber, masonry and modern materials
- Construction methods for substructures and superstructures
- Testing, quality control and sustainable construction

#### 3. Surveying, Measurement and Site Engineering

- Levelling, traversing and topographical surveying
- Setting-out, coordinates and earthwork calculations
- Total stations, GNSS/GPS and digital survey methods

#### 4. Structural Mechanics and Principles of Structural Design

- Loads, reactions, shear forces and bending moments
- Stress, strain, deformation, beams, columns and trusses
- Introductory reinforced-concrete and steel design

#### 5. Geotechnical Engineering and Soil Mechanics

- Soil classification, properties and engineering geology
- Compaction, permeability, consolidation and shear strength
- Site investigation, bearing capacity and foundations

#### PROGRAMME HIGHLIGHTS

- Industry-relevant technical curriculum
- Practical and digital engineering applications
- Progression pathway to further degree studies
- Strong foundation for civil engineering careers

### LEVEL 5 - 120 CREDITS

#### 1. Advanced Structural Analysis and Design

- Advanced analysis of structural systems and loading
- Reinforced-concrete and structural-steel member design
- Safety, serviceability, durability and design standards

#### 2. Advanced Geotechnical Engineering and Foundation Design

- Ground investigation and geotechnical-data interpretation
- Settlement, bearing capacity, slopes and retaining systems
- Shallow/deep foundations and ground improvement

#### 3. Highway and Transportation Engineering

- Transportation planning, traffic analysis and road safety
- Highway alignment, geometric design and junctions
- Pavement design, drainage and sustainable transport

#### 4. Hydraulics, Water Resources and Environmental Engineering

- Fluid mechanics, pipe flow and open-channel flow
- Hydrology, water supply, drainage and wastewater systems
- Stormwater, flood management and environmental protection

#### 5. Civil Engineering Project and Construction Management

- Planning, scheduling, resources and cost control
- Procurement, contracts, risk, quality and health & safety
- Stakeholder, site and project-delivery management

#### CAREER PATHWAYS

- Civil / Site Engineer
- Structural Engineering Assistant
- Geotechnical Engineering Assistant
- Transportation / Highway Engineer
- Water / Infrastructure Engineer
- Project / Construction Coordinator