

BIM-Enabled Quantity Surveying (5D BIM)

Course Objective:

This course is designed to equip Quantity Surveyors with practical BIM skills to extract quantities, prepare BOQs, perform cost estimation, manage variations, and support project cost control using BIM workflows. The focus is on **BIM as a support system for QS**, not as a modeling-only discipline.

Target Audience:

- Quantity Surveyors & Cost Engineers
- Estimation & Billing Engineers
- Planning & Contracts Engineers
- Civil Engineers transitioning to BIM-QS roles
- BIM Coordinators supporting cost management

Course Outcomes:

After completing this course, participants will be able to:

- Perform BIM-based quantity take-off confidently
- Prepare BOQs and cost estimates from BIM models
- Manage variations and cost changes using BIM
- Support billing, valuation, and cost control activities
- Work effectively as a **BIM-enabled Quantity Surveyor**

Course Outline

The course comprises **40**-hours of theory and labs and is divided into **8** different Modules. Each chapter will be followed by hands-on lab exercises to reinforce learning and gauge understanding of the topics covered.

Table of Contents:

Module 1: BIM Fundamentals for Quantity Surveyors

- What BIM means for Quantity Surveying
- Difference between 2D QS workflow vs BIM-based QS
- BIM dimensions explained: 3D, 4D, **5D (Cost)**
- BIM Execution Plan (BEP)



- Level of Development (LOD 100–500) and QS relevance

Module 2: BIM Models & Data for QS

- Understanding BIM elements vs traditional drawings
- Model intelligence: parameters, properties & quantities
- Classification systems (Uniclass, OmniClass)
- Model accuracy & quantity reliability checks
- QS responsibility in model review

Module 3: Quantity Take-Off Using BIM Models

- Model-based quantity take-off concepts
- Extracting quantities from **Autodesk Revit**
 - Concrete, reinforcement, masonry, finishes
 - Doors, windows, floors, walls, structural elements
- Creating quantity schedules & material take-off
- Handling model revisions & updates

Module 4: Coordination Models for QS Review

- Using coordination models for quantity validation
- Clash detection impact on quantities
- Overview of **Autodesk Navisworks** for QS
- Model federation and its QS benefits

Module 5: BOQ Preparation Using BIM

- Linking BIM quantities to BOQ structure
- Work Breakdown Structure (WBS) for QS
- Mapping model elements to BOQ items
- Exporting quantities to Excel
- Managing item descriptions & measurement rules

Module 6: Model-Based Measurement & Standards

- Measurement rules (IS, SMM)
- Aligning BIM quantities with standard measurement methods
- Dealing with non-modelled items (preliminaries, contingencies)



Module 7: Troubleshooting 5D BIM

- Introduction
- QS Measurement Vs Geometry from Model
- Model Quantities and Model Derived Quantities
- Missing Objects / Objects Used in the Wrong Context
- Below Ground / Above Ground Quantities
- Assembly Items
- Rooms
- Proxy Objects
- Replica Dimensions in Same Object
- Different Lod in the Same Model
- Missing Quantities and Geometry Inaccuracies
- Labelling
- Views and Details

Module 8: BIM for Tendering & Contracts

- BIM deliverables in tender stage
- Model-based tender quantity validation
- Employer's Information Requirements (EIR) – QS role
- BIM risks & contractual considerations
- QS liability in BIM projects

