

# Building Construction Estimating

## Course Objective:

Students will learn the entire process of producing a complete, detailed estimate for a specific building project. They will be required to read and understand construction documents, perform detailed quantity surveys, develop detailed estimates for general conditions, sitework, concrete, and carpentry, analyze subcontractor proposals and tabulate a complete estimate.

Following is a week-by-week description of the course:

### Week 1: Estimating Process

Students will learn the importance of accurate estimating in the profitability of construction projects. Construction documents are discussed and emphasis is placed on being able to understand them and how they are organized. Students learn how to develop an Estimate Survey Sheet for a building project.

### Week 2: Logistics and General Conditions

Students learn the importance of developing a detailed logistics plan for a project and how that plan contributes to the project success. General Conditions for a project are defined and estimated for the example project.

### Week 3: Estimating Software and Procedures

Students are introduced to On Screen Takeoff (OST), software that saves considerable time and energy when doing quantity surveys. Formats for quantity surveys and corresponding unit prices are reviewed in conjunction with OST.

### Week 4: Sitework

Specific trades, such as mass earthwork, site utilities, paving, site concrete, site lighting, landscaping, and other miscellaneous site items are reviewed. Students learn how to quantify sitework and are asked to develop a sitework estimate for the example project.

### Week 5: Foundation Systems

A variety of foundation systems are covered, including shallow footings, foundation walls, grade beams, caissons, and piles. Earth retention systems such as soldier pile and lagging, steel sheet piling, and slurry walls are discussed. Building excavation and backfill are also covered.

### Week 6: Superstructures

Topics include determining the optimal structural system for a building. Students review structural steel and the various types of concrete frames. Hoisting of structural systems and optimization of crane usage are also covered. Students prepare a detailed concrete estimate for the example project.

**Week 7: Exterior Envelope**

Students consider the various types of exterior cladding for a building and the differences in cost for each. Other trades discussed include fenestrations, roofing and sheet metal, exterior doors, and caulking and sealants.

**Week 8: Interiors**

A variety of components of the interior of a building are discussed. Quantity surveys and unit prices are covered, including such items as metal studs and drywall, acoustic ceilings, carpentry and millwork, painting and wall covering, types of flooring, tile work, etc. Students prepare a detailed carpentry estimate for the example project.

**Week 9: Vertical Transportations, Plumbing and Fire Protection**

Types of elevators and escalators are covered. Plumbing systems, such as foundation drainage, roof drainage, water systems, waste, and vent systems, are described. Fire sprinkler systems including dry systems are reviewed.

**Week 10: HVAC and Electrical**

A variety of heating and cooling systems are described and costs discussed, including central plants, built-up units, roof-top units, energy efficiency, and temperature control systems. Electrical systems, such as power, lighting, fire alarm, sound, etc., are also discussed.

**Exam Week: Class projects will be critiqued in conjunction with an oral exam.**

**Text:** No text is required.

**Software:** On Screen Takeoff (OST) and MS Excel spreadsheets.

**Grade Determination:**

Term Project	90%
Class Participation	10%