

Prepared by the Department of Natural Sciences and Applied Technology

Date of Departmental Approval: February 10, 20117

Date approved by Curriculum and Programs: March 29, 2017

Effective: Fall 2017

- 1. Course Number: CON115**
Course Title: Construction Estimating

Description: Students explore various systems and methods for estimating construction costs of residential and commercial buildings, including elements of cost associated with construction technology and project management. The scope includes sub-systems, earthwork foundations, timber, steel, and masonry structure. The course emphasizes relationships in quantities of specific materials with the department variable of associated labor.

2. Student Learning Outcomes (instructional objectives, intellectual skills):

Upon successful completion of this course, students are able to do the following:

- Compare various estimating methods.
- Explain advantages and disadvantages of multiple estimating methods.
- Elicit and utilize pertinent information from drawings and specifications.
- Identify the sources of pricing information.
- Organize and estimate labor and material costs for each phase of a construction project.
- Calculate overhead.
- Prepare a complete job take off and bid.

- 3. Credits:** 3 credits

- 4. Satisfies General Education Requirement:** No

- 5. Prerequisite:** None

- 6. Semester Offered:** Fall

- 7. Suggested Guidelines for Evaluation:** Students are evaluated on home estimating assignments, class work, midterm and final examinations.

8. General Topical Outline:

- I. Overview
- II. Organization of Estimates
 - A. Types of estimates
 - B. Available information
 - C. Potential errors
 - D. Check lists
- III. Excavation
 - A. General and special
 - B. Topsoil
 - C. Trenching
 - D. Backfill and grading
 - E. Landscaping
 - F. Roads, driveways and walkways
- IV. Concrete
 - A. Aggregates, and cement
 - B. Placing and vibrating
- V. Forms
 - A. Footings
 - B. Walls, piers and slabs

- C. Steel
- D. Damp-proofing
- VI. Masonry
 - A. Cinder and concrete block
 - B. Flagstone
 - C. Brick
 - D. Chimneys and Fireplaces
 - E. Pointing and cleaning
- VII. Framing
 - A. Girts, sills, joists, shoes and plates, studs, strapping, bridging, blocking, sheathing, rafters, and related work
- VIII. Trim
 - A. Exterior: door frames, doors, windows and frames, siding, corner boards, gutter, fascia, soffitt, ceiling lumber, ridges, and related items
 - B. Interior: frames and doors, bath and kitchen cabinets, millwork, wood floors, vinyl and asphalt floors
- IX. Structural Steel
 - A. Nails, bolts, lally columns, I-beams, wrought iron railing, areaways, angle irons, etc.
- X. Roofing, flashings and sheet metal
 - A. Asphalt shingles
 - B. Roll roofing
 - C. Tar and gravel
 - D. Metal flashing and sheet metal
- XI. Sheetrock and plaster
 - A. Unit method vs. Joint method
 - B. Sanding and priming
- XII. Heating
 - A. System types
 - B. Radiation calculations
 - C. Boiler, piping, valves and pumps.
- XIII. Plumbing
 - A. Rough plumbing: waste, venting, water service and piping
 - B. Finish: fixtures and accessories
- XIV. HVAC
 - A. Duct fabrication
 - B. "per piece" method
 - C. "per pound" method
- XV. Painting
 - A. Exterior: Body and trim
 - B. Interior: Walls, ceilings and trim.
 - C. Stains, polyurethane and special finishes
- XVI. Overhead
 - A. Percentages
 - B. Listing per job
- XVII. Specifications
 - A. Details of construction techniques and materials
 - B. Trade names, equals
 - C. Legal questions and concerns
- XVIII. Commercial Applications
 - A. Unique and special problems
 - B. Complete review