SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: BUILDING & CONSTRUCTION ESTIMATING

Code No.: ARC 101-4

Program: ARCHITECTURAL TECHNICIAN

Semester: I

Date: JUNE, 1991

Author: M. URSELL

New: _____ Revision: X

APPROVED: _____ _____

Chairperson Date

CALENDAR DESCRIPTION

BUILDING & CONSTRUCTION ESTIMATING	ARC 101-4
Course Name	Course Number

PHILOSOPHY/GOALS:

To identify & solve problems related to quantity take-off and estimating.

To identify various types of estimates.

To build unit costs for construction elements.

To appreciate the economic factors involved in design and construction.

METHOD OF ASSESSMENT (GRADING METHOD):

SEE ATTACHED SHEET

TEXTBOOK(S):

Estimating Construction Costs - by Peurifoy

METHOD OF ASSESSMENT (all courses)

The following grades will be assigned:

A	- 75-100%	consistently above average achievement
B	- 66-74%	average achievement
C	- 55-65%	satisfactory achievement
I	- incomplete	
R	- Repeat	the student has failed to achieve the objectives of the course and must repeat the course

The "I" grade (incomplete) designation indicates that the student has not completed the objectives required in specific course areas.

Semester work will be made up of tests and assignments. All tests and assignments must be completed when assigned. Late assignments or projects will not be tolerated.

Attendance is mandatory in all classes.

Tests and assignments will be given on a regular basis throughout the semester. The weighted grade between practical theoretical work will depend on the type of course. Final examinations are also mandatory for any student that does not maintain an "A" average in the course or who has not completed all assignments by their due date.

NOTE: Chronic absenteeism by any student will result in the student not being admitted to class and ultimately his failure to receive an acceptable grade in the course.

BUILDING CONSTRUCTION ESTIMATING

TOPIC 1 Architectural Blueprint Reading Review

1-1 - to identify the various common architectural symbols

1-2 - to draw the architectural symbols

1-3 - to identify the various electrical and mechanical symbols

1-4 - to identify the various architectural conventions

1-5 - to identify the rules of dimensioning architectural drawings

1-6 - to identify the common abbreviations that are used on architectural and mechanical drawings

1-7 - to identify the methods of referencing architectural drawings

1-8 - to prepare a check list of information that should be included on architectural floor plans, elevations, etc.

1-9 - to complete an architectural blueprint reading exercise.

TOPIC 2	Mathematics for Estimating
2-1	- to identify the mensuration formulas used in calculating volumes of shapes
2-2	- to identify the equivalent decimals of inches in feet
2-3	- to define a plane
2-4	- to solve area problems for plane figures
2-5	- to define a circle
2-6	- to solve circumferences and area problems involving circular shapes
2-7	- to identify a trapezoid
2-8	- to determine the areas and volumes of various trapezoidal shapes
2-9	- to define a hexagon
2-10	- to solve area and volume problems involving hexagon shapes
2-11	- to define irregular shapes
2-12	- to solve area problems involving irregular shapes
2-13	- to define cubic measure
2-14	- to define and solve areas and volumes problems for prisms
2-15	- to define and solve area and volume problems for cones
2-16	- to define and solve area and volume problems for spheres
2-17	- to identify and use function of number tables

TOPIC 3	Estimating Earthwork and Site Work
3-1	- to identify a grade
3-2	- to identify a slope
3-3	- to identify stadia
3-4	- to identify cut and fill
3-5	- to identify the characteristics of contours
3-6	- to identify angle of repose
3-7	- to identify the C.I.Q.S. standards for estimating earthwork and site work as per division 2
3-8	- to identify the different types of excavation for common structures
3-9	- to solve general excavation problems
3-10	- to identify payline
3-11	- to identify gridding
3-12	- to solve an excavation and earth fill problem using the gridding procedure
3-13	- to identify the average end area method of determining earth quantities
3-14	- to determine the swell factors for various types of soil
3-15	- to determine the labour production rates for handling earth by hand and also by machine
3-16	- to identify the local material costs for gravel, fill, sand etc.
3-17	- to estimate the sitework and excavation requirements for a typical custom residence.
3-18	- to identify the quantity sheet
3-19	- to identify the cost analysis sheet

TOPIC 4	Estimating Concrete and Formwork
4-1	- to identify the C.I.Q.S. standards for measurement of concrete as per division 3
4-2	- to identify the various categories of formwork
4-3	- to identify S.F.C.A.
4-4	- to solve S.F.C.A. problems
4-5	- to identify kickers
4-6	- to identify form ties
4-7	- to identify snap ties
4-8	- to identify angular braces
4-9	- to identify panel forms
4-10	- to identify walers
4-11	- to identify the various re-bar sizes and determine re-bar weights
4-12	- to solve quantity take-offs for footings
4-13	- to solve quantity take-off problems for foundation walls
4-14	- to solve quantity take-off problems for floor slabs
4-15	- to solve quantity take-off problems for columns
4-16	- to determine the cost of local materials for concrete and framework
4-17	- to solve a quantity take-off for a residence foundation
4-18	- to construct a cost analysis for a residence foundation

TOPIC 5	Carpentry
5-1	- to identify the various framing members used in home construction
5-2	- to solve board measure problems
5-3	- to solve stud wall and partition quantity problems
5-4	- to solve floor and ceiling joist quantity problems
5-5	- to solve sub-floor quantity problems
5-6	- to solve bridging quantity problems
5-7	- to solve roof-rafter framing quantities
5-8	- to solve collar tie quantity problems
5-9	- to solve roof sheeting problems
5-10	- to solve interior and exterior sheeting problems
5-11	- to solve insulation quantity problems
5-12	- to determine unit costs for exterior walls
5-13	- to determine unit costs for interior partitions
5-14	- to determine unit costs for roofing
5-15	- to determine unit costs for floors
5-16	- to determine unit costs per square foot for rough carpentry
5-17	- to determine unit costs per square foot for finish carpentry
5-18	- to identify local material and labour rates and costs
5-19	- to solve a quantity take-off for a custom residence for rough carpentry for a custom residence
5-20	- to construct a cost analysis for finish and rough carpentry for a custom residence

TOPIC 6 Estimating Masonry

6-1 - to identify the various types of brick and block

6-2 - to identify the various types of masonry mortar

6-3 - to solve quantity of brick problems by the number per square foot method

6-4 - to solve quantity of brick problems by the number per cubic foot method

6-5 - to determine the labour required to lay bricks

6-6 - to determine the supply cost of brick per M

6-7 - to identify the various types of mortar bond

6-8 - to identify the various types of pattern bond

6-9 - to determine the labour process required to lay concrete blocks

6-10 - to calculate the brick required for a two car garage

6-11 - to determine the quantity of brick required for a custom residence

6-12 - to construct a cost analysis for masonry on a custom home

TOPIC 7	Estimating Roofing & Flashing
7-1	- to identify roofing terminology
7-2	- to identify and solve roof pitch problems
7-3	- to identify a built-up roof
7-4	- to identify an asphalt roof
7-5	- to determine the labour production rates for asphalt shingled roofs
7-6	- to determine the labour production rates for built-up roofs
7-7	- to identify the types of flashing
7-8	- to solve flashing quantity problems
7-9	- to identify the C.I.Q.S. standards for moisture protection as per division seven
7-10	- to solve roofing problems

TOPIC 8	Estimating Drywall & Lath and Plaster
8-1	- to identify the C.I.Q.S. standards of measurement for finishes as per division 7
8-2	- to identify lath and plaster
8-3	- to identify drywall types
8-4	- to determine the labour production rates for applying lath and plaster
8-5	- to determine the labour production rates for applying drywall
8-6	- to identify the materials used for plaster
8-7	- to identify the materials used for gypsum board
8-8	- to determine local material costs
8-9	- to determine local labour rates
8-10	- to solve drywall quantity take-off problems including taping
8-11	- to construct a cost analysis for a drywall application in a custom home

TOPIC 9	Estimating Electrical Wiring Costs
9-1	- to identify the C.I.Q.S. standard procedures for measurement of electrical component installations
9-2	- to identify three types of electrical wiring estimate
9-3	- to prepare a checklist of electrical facility requirements for a residence
9-4	- to identify the materials used in domestic electrical wiring installations
9-5	- to determine local costs of electrical materials
9-6	- to determine labour production rates for installation of domestic wiring components
9-7	- to identify and construct an electrical wiring schedule
9-8	- to calculate an electrical wiring quantity take-off for a custom residence
9-9	- to construct a cost analysis for an electrical wiring installation

TOPIC 10	Estimating Painting and Finishing
10-1	- to identify the unit cost method of painting and finishing estimating
10-2	- to identify the properties of various types of paints
10-3	- to identify the various paint thinners and additives
10-4	- to identify the various methods of preparing a surface for painting or staining
10-5	- to identify the surface area of coverage for various paints and stains
10-6	- to determine the local costs of paints and stains, etc.
10-7	- to calculate local labour production rates for painting
10-8	- to identify the equipment required for painting
10-9	- to solve various painting and finishing problems
10-10	- to build unit rates for painting and finishing
10-11	- to calculate a quantity take-off for a custom residence
10-12	- to construct a cost analysis for the painting, etc. of a customer residence

TOPIC 11	Estimating Plumbing Costs
11-1	- to identify the various components used in residential waste disposal systems
11-2	- to prepare a riser diagram for a domestic waste disposal system
11-3	- to identify and relate to others the Plumbing Code regulations governing domestic plumbing systems
11-4	- to prepare a layout of domestic water services for a custom residence
11-5	- to identify the various plumbing materials in use locally
11-6	- to determine local plumbing material costs
11-7	- to identify the dimensions and weights of various copper and iron pipe
11-8	- to identify the fittings used for domestic plumbing systems
11-9	- to estimate the cost of roughing in plumbing
11-10	- to determine labour production rates for installing plumbing systems
11-11	- to estimate finish plumbing costs
11-12	- to construct a bill of materials for a custom residence plumbing system
11-13	- to prepare a cost analysis for a domestic plumbing system

TOPIC 12	Heating
12-1	- to identify types of hot water heating systems
12-2	- to identify types of forced air heating systems
12-3	- to identify types of electrical heating systems
12-4	- to determine local unit rates for the installation of heating systems
12-5	- to prepare a cost analysis for a custom residence using local unit rates for a forced air heating system

TOPIC 13 Estimating Flooring

13-1 - to identify the various types of flooring and materials

13-2 - to determine local costs of selected flooring materials

13-3 - to determine local production rates of installing various types of flooring

13-4 - to prepare a cost analysis for flooring on a custom residence using built-up rates