SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE:	Building and Construction Estimating		
CODE NO. :	ARC 101	**SEMESTER:**	2
PROGRAM:	Civil Engineering Technician Construction Carpentry Techniques		
AUTHOR:	Barry Sparrow		
DATE:	January 2015	**PREVIOUS OUTLINE DATED:**	January 2014
APPROVED:	*"Corey Meunier"* **CHAIR**		**DATE**
TOTAL CREDITS:	5		
PREREQUISITE(S):	none		
HOURS/WEEK:	4		

Copyright ©2015 The Sault College of Applied Arts & Technology
Reproduction of this document by any means, in whole or in part, without prior written permission of Sault College of Applied Arts & Technology is prohibited.
For additional information, please contact Corey Meunier, Chair
School of Technology & Skilled Trades
(705) 759-2554, Ext. 2610

I. COURSE DESCRIPTION:

This course introduces the student to the fundamental principles of construction estimating. The topics covered will deal with the measurement of construction work, reading construction documents (prints and specifications) as well as records management. Emphasis is placed on estimating site work, concrete, masonry, steel and wood, using detailed and systematic methods. Computer-based spreadsheets will be used to prepare estimates and assignments. Students will learn to assemble and sort estimate information for a complex project in a logical and manageable manner and develop organizational and time management skills. Students will also become familiar with issues relating to construction waste management and reduction as well as environmental controls as it relates to construction estimating.

II. LEARNING OUTCOMES:

1. Assist in preparing construction specifications, material and cost estimates.

2. Assist in planning, scheduling and monitoring construction and civil engineering projects.

3. Apply sound environmental practices and policies in civil engineering/construction projects.

4 Demonstrate relevant mathematical, computer and technical problem solving skills as it relates to civil engineering/construction projects.

5 Demonstrate an understanding of the working roles and inter-relationships required to adhere to the objectives of the project and work in accordance to labour-management principles and practices.

III. REQUIRED RESOURCES/TEXTS/MATERIALS:

Estimating in Building Construction
Frank R. Dagostino/Leslie Feigenbaum/Clint Kissoon
Canadian Edition
Pearson Prentice Hall T
ISBN 978-0-13-223137-4

IV. EVALUATION PROCESS/GRADING SYSTEM:

Assignments and Activities (8-10)	50%
Mid-term Test	25%
Final Test	25%
Total	100%

The following semester grades will be assigned to students:

Grade	**Definition**	*Grade Point Equivalent*
A+	90 – 100%	4.00
A	80 – 89%	
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00

CR (Credit)	Credit for diploma requirements has been awarded.
S	Satisfactory achievement in field /clinical placement or non-graded subject area.
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
NR	Grade not reported to Registrar's office.
W	Student has withdrawn from the course without academic penalty.

V. SPECIAL NOTES:

Attendance:
Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session. Late arrivers may not be granted admission to the room.

Assignments and Examination Policy:
If a student is unable to write a test or exam at the scheduled time the following procedure shall apply:

- The student shall provide the professor with advance notice (in writing) of the need to miss the test
- The student shall provide documentation as to the reason for the absence and the make-up will be at the discretion of the professor.
- Upon return the student is responsible to make arrangements for the writing of the test. This arrangement shall be made prior to the next schedule class.
- In the event of an emergency, the student shall telephone the professor as soon as possible at 759-2554, to notify of the absence. If the professor is not available, the college has a 24 hour voice mail system.
- In the event of an test missed due to emergency, the student shall provide documentation from a professional such as doctor or lawyer.
- The student shall write both the mid-term and final exams to be eligible to pass the course.
- A grade of D will allow a pass in the course, however the student cannot graduate from the program with a D average.

All late assignments (without documentation) will receive a maximum grade of C (60%). Assignments more than one week late may receive a grade of zero.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.

VI. TOPIC OUTLINE

Outcome	Topic and Content	Reading	Week
1,4	1. Estimating Mathematics and Measurement 1.1. Plane geometry formulas 1.2. Volume formulas 1.3. Sample calculations and assignment 1.4. SI units in construction 1.5. Assignment 1 – Math Review	LMS Handout	1
1,2,5,3	2. Estimating Strategies and Organization 2.1. Types of estimates 2.2. Direct and indirect costs 2.3. Waste reduction and management strategies 2.4. Developing a work breakdown from drawings and specifications 2.5. Organizing using the CSI format 2.6. Estimates and contract types 2.7. Bid Documents and bidding procedures	Chapter 1 Chapter 2 Chapter 3 LMS Handout	2
1,4	3. Using Computers and Spreadsheets in Estimating 3.1. Computer-based estimating and bidding 3.2. Spreadsheet Overview – Workbooks and Worksheets 3.3. Formatting and forms 3.4. Formulas 3.5. Using goal seek	Chapter 19 LMS Handout	3,4
1,4	4. Estimating Earth and Site Work 4.1. Contour and spot elevation review 4.2. Calculating cut and fill volumes (grid method) 4.3. Calculating volumes (average end area method) 4.4. Balancing cut and fill using goal seek 4.5. Estimating general excavation and material handling volumes 4.6. Estimating tonnage for asphalt paving 4.7. Environmental considerations for earthwork	Chapter 8 LMS Handout	5,6

Outcome	Topic and Content	Reading	Week
1,4	5. Estimating Reinforced Concrete 5.1. Review of types of concrete work 5.2. Using the 'centre line length' concept 5.3. Formwork estimation (footings, walls, slabs) 5.4. Concrete accessories and finishing 5.5. Estimating reinforcing steel	Chapter 9 LMS Handout	7
	6. Mid-term Exam		8
1,4	7. Estimating Masonry 7.1. Review of types of masonry construction 7.2. Estimating concrete block 7.3. Estimating brick 7.4. Masonry accessories 7.5. Scaffolding requirements	Chapter 10 LMS Handout	9
1,4	8. Estimating Steel and Metals 8.1. Estimating structural steel 8.2. Estimating steel joists and deck 8.3. Miscellaneous metals	Chapter 11 LMS	10
1,4	9. Estimating Wood 9.1. Review of wood frame construction 9.2. Estimating floor and platform framing 9.3. Estimating frame wall construction 9.4. Estimating roof framing and trusses 9.5. Estimating panel area quantity 9.6. Using roof factors to determine slope length	Chapter 12 LMS Handout	11,12
1,4	10. Estimating Thermal and Moisture Protection 10.1. Review foundation waterproofing and damp-proofing 10.2. Estimating asphalt shingles 10.3. Estimating membrane roofing 10.4. Estimating foundation, roof and wall insulation	Chapter 13 LMS Handout	13
1,4	11. Estimating Doors, Windows and Finishes 11.1. Residential doors and windows 11.2. Curtain wall frame and window systems 11.3. Estimating hardware and accessories 11.4. Estimating finishes (walls, floors and ceilings)	Chapter 14 LMS	14
	12. Final Exam		15