SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON.

COURSE OUTLINE

COURSE TITLE: Architectural Engineering

COURSE CODE: ARC 235

PROGRAM: Architectural Technician

SEMESTER: I (Fall)

AUTHOR: B. Sparrow

DATE: September 1992

PREVIOUSLY DATED:

APPROVED: L P Crozetti (DEAN) DATE: 92-08-18

TOTAL CREDIT HOURS: 48
PREREQUISITES: MCH 100

I. PHILOSOPHY AND GOALS

This course provides the student with a basic understanding of structural engineering and design, and knowledge of strength of materials. The student will be able to solve basic strength of material and structural design problems at the Technician level.

II. STUDENT PERFORMANCE OBJECTIVES

Upon successful completion of the course, the student will be able to:

1. Analyze and solve problems by drawing free body diagrams and applying the equations of equilibrium.

2. Apply principles of stress and strain to solve structural design problems for concrete, steel and wood.

3. Determine centroid, moment of inertia and radius of gyration for simple geometric areas and composite areas.

4. Calculate and draw shear force and bending moment diagrams for simple beams.

5. Identify commonly used structural components and systems for buildings.

6. Describe and present an analysis of a structural system used for a building or other built structure.

III. TOPICS TO BE COVERED

1. Review of Statics
2. The Stress/Strain Relationship
3. Centroid, Moment of Inertia and Radius of Gyration
4. Shear and Moment in Beams
5. Steel, Concrete and Wood Structures

IV. LEARNING ACTIVITIES

REQUIRED RESOURCES

1.0 Statics Review

Upon successful completion of this unit, the student will be able to:

Handouts and Tutorials

1.1 Understand forces and appropriate units of measure.

1.2 Understand and manipulate force vectors.

1.3 Analyze and draw free body diagrams.

1.4 Solve problems using the equilibrium equations.

1.5 Analyze forces in simple trusses.

2.0 Stress and Strain

2.1 Define axial and shearing stresses.

Applied Strength of Materials
Chapter 1

2.2 Define ultimate stress, allowable stress and factor safety.	Applied Strength of Materials Chapter 1
2.3 Identify structural components and shapes.	
2.4 Analyze and solve design problems involving stress and strain.	
2.5 Discuss Poisson's Ratio, elastic limit and modulus of elasticity.	
2.6 Examine and solve problems involving thermal stresses.	Applied Strength of Materials Read Chapter 2
3.0 Centroid and Moment of Inertia	
3.1 Define and determine the centre of gravity of an area.	Applied Strength of Materials Chapter 5
3.2 Determine centroid of composite areas.	
3.3 Define and solve problems involving centre of gravity, centroid and moment of inertia.	
3.4 Examine and solve problems using the transfer formula and radius of gyration.	
4.0 Stresses in Simple Beams	
4.1 Examine types of beams and loadings.	Applied Strength of Materials Chapter 6
4.2 Examine types of beam end supports.	

4.3 Analyze and draw shear force diagrams.	Applied Strength of Materials Chapter 6
4.4 Analyze and draw moment diagrams.	
4.5 Solve problems involving shear force diagrams, beam loading and moment diagrams.	Applied Strength of Materials Selected Problems Chapter 7
5.0 Structural Systems	
5.1 Examine types of building structures, including reinforced concrete, steel and heavy timber.	Handouts and Tutorials
5.2 Solve selected problems for beams of various materials.	Applied Strength of Materials Chapter 7 Handout and Tutorials
6.0 Analysis of Building Structures	
6.1 Give a presentation on the structure and its design implications on a given or assigned building.	

V. METHOD OF EVALUATION

Students will be assigned a final grade based on successful completion of tests, assignments, projects and attendance, weighted as follows:

Problem Assignment Sets	45%
Tests (3)	45%
Structure Analysis Presentation	10%
TOTAL	100%

Late assignments will be penalized 10% for each day late. Attendance and punctuality will be considered in the student assessment.

A final letter grade will be assigned as follows:

A+	90-100%
A	80-89%
B	70-79%
C	55-69%
R	Repeat

VI. REQUIRED STUDENT RESOURCES

Applied Strength of Materials
Fourth Edition
Jensen/Chenoweth
McGraw-Hill

VII. ADDITIONAL RESOURCES AND MATERIALS

Additional materials are available in the library. Students may also wish to consult with the instructor.

VIII. SPECIAL NOTES

1. Students with special needs are encouraged to discuss required accommodations in confidence with the instructor.

2. The instructor reserves the right to modify the course and course outline as deemed necessary to meet the needs of the students.

3. At the conclusion of the semester, students with total grades less than 55% will be given a rewrite examination at the discretion of the instructor. The decision to allow a rewrite will be based on attendance, participation, and overall performance.

4. In the event a rewrite occurs, it will be granted only once and will cover all course material. The maximum course grade attainable through a rewrite is C.

5. Attendance is mandatory for success in this course. Absence from classes without reasonable cause will not be tolerated.