

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: Architectural Engineering

CODE NO.: ARC 235

PROGRAM: Architectural Technician

SEMESTER: III

AUTHOR: S. Ienco

DATE: August 1991

NEW: _____ REVISION: X

APPROVED: L P Crozetta 9/03/22
CHAIRPERSON DATE

M. Uman

08-22-91

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Total Credit Hours 48

Prerequisite (s) MCH 100

I. PHILOSOPHY/GOALS:

The general objective of the course is to develop a basic working knowledge of Strength of Materials. This will enable the student to understand and solve basic strength of materials and structural problems at the Technician level.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will:

- 1) Investigate and solve problems by sketching the free body diagram and applying the equations of equilibrium.
- 2) Apply fundamental principles of stress/strain relationship to analyze and design simple engineering problems.
- 3) Calculate 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) Analyze and design (excluding reinforcing) a simple retaining wall.
- 6) Perform laboratory experiments that will enhance the students basic understanding of stress/strain relationship and load flexure relationships in beams.

III. TOPICS TO BE COVERED:

- 1) Brief Statics Review.
- 2) Stress/Strain Relationship.
- 3) Centroid, Moment of Inertia and Radius of Gyration.
- 4) Shear and Moment in Beams.
- 5) Retaining Walls.
- 6) Laboratory Experiments.

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IV. TOPICS DESCRIPTION

TOPIC NO.	TOPIC DESCRIPTION	REFERENCE
1.	<u>Statics Review</u> <ul style="list-style-type: none">- Forces and Units- Force Vectors Manipulation- Free-Body Diagram- Equilibrium Equations- Truss Analysis	Hand-outs & Tutorials
2.	<u>Stress/Strain Relationships</u> <ul style="list-style-type: none">- Axial and Shearing Stresses- Units, Ultimate Stress, Allowable Stress, Factors of Safety- Structural Shapes Identification- Analysis and Design Problems- Axial and Shearing Strain- Poisson's Ratio- Elastic Limit, Modulus of Elasticity, Stress-Strain Diagram- Axial Stresses in Members of two Materials- Thermal Stresses	Chapter 1
3.	<u>Centroid and Moment of Inertia</u> <ul style="list-style-type: none">- Centre of Gravity of an Area- Centroid of Composite Areas- Moment of Inertia- Transfer Formula- Moment of Inertia of Composite Areas- Radius of Gyration	Chapter 5

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4.	<u>Stresses in Simple Beams</u> - Types of Beams and Loadings - End Beam Supports - Shear-Force Diagram - Moment Diagrams - Relationship between Beam Loading Shear Diagram and Moment Diagram - Moving Loads - Flexure Formula	Chapter 6
5.	<u>Retaining Walls</u> - Types of Retaining Walls - Soil Pressures - Design Considerations	Hand-outs & Tutorials

V. REQUIRED STUDENTS RESOURCES (including textbooks and workbooks)

APPLIED STRENGTH OF MATERIALS

Latest Edition
Jensen/Chenoweth
McGraw Hill

VI. METHOD OF EVALUATION

A final grade will be derived from the results of laboratories, quizzes and three tests weighed as follows:

Laboratories and quizzes, each of equal weight	25%
Three tests each worth 25%	75%
TOTAL	<u>100%</u>

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VI. METHOD OF EVALUATION (Continued)

The grading system used will be as follows:

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

- 1) Minimum acceptable grade for this course is 55%.
- 2) The in class quizzes will cover one problem that was dealt with during a lecture or assigned for homework. The quiz problem can be given at any time during class hours without advance notice; and the student is expected to solve the problem under examination conditions.

The results of these quizzes, in addition to making up part of your overall grade, should be used by the student as a guide to check his/her progress in the course on a regular basis.
- 3) Homework problems are assigned during lecture, inspected by the instructor during subsequent lecture, followed by a discussion and solution to selected problems.
- 4) If at the end of the semester your overall average of the combined laboratories, quizzes and three tests is below 55%, then it will be up to the instructor whether you receive an R repeat or a rewrite. The criteria employed for arriving at that decision is class attendance, class participation and overall grade, which should be a least 45%.
- 5) In case a rewrite is granted, it will be permitted only once, it will cover the entire course outline, and it will limit the maximum obtainable grade for the course to 60%.