

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: Structural Engineering
CODE NO. ARC 219
PROGRAM: Civil Engineering Technology
SEMESTER: IV (Winter)
AUTHOR: S. Ienco B1164 Phone 759-2554 X 587
DATE: January 1997

APPROVED: _____

(DEAN)

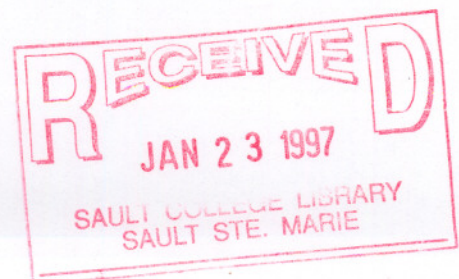
DATE: _____

Jan. 8, 1997

TOTAL HOURS PER WEEK: 4

PREREQUISITES: MCH 212

7-JAN-97



STRUCTURAL ENGINEERING
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I. COURSE DESCRIPTION

The student will acquire a basic knowledge in the design of structural steel elements such as beams, columns, tensile members and base plates. The interaction of these various components will be emphasized by designing the main structural components for a one-storey building.

The Gravity Frame Design software package will be used as a tool to enhance the learning process.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE

A. Learning Outcomes

1. Design structural steel elements such as beams using Limit States Design.
2. Design structural steel columns using Limit States Design.
3. Design the beams, columns, tensile members and base plate components for a one storey steel building.

B. Learning Outcomes and Elements of the Performance

Upon successful completion of the course the student will demonstrate an ability to:

1. Design structural steel elements such as beams using Limit States Design

Elements of the Performance:

- review shear and moment diagrams for simply supported beams
- review flexural and shear formulas
- determine dead load and live load on beams given floor loadings
- identify major beam and connecting components of an actual building
- identify major beam failure modes
- calculate beam deflections using appropriate handbook equations
- design laterally supported beams manually
- design laterally unsupported beams manually
- employ the computer to design beams

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2. Design structural steel columns using Limit States Design.

Elements of the Performance:

- identify types of column cross sections
- summarize and employ Euler's formula
- identify and interpret effects of column end restraints
- identify column and connecting components of an actual building
- design columns with axial loads only
- design columns with combined bending and axial loads
- employ the computer to design columns

3. Design the beams, columns, tensile members and base plate components for a one storey steel building.

Elements of the Performance:

- outline general design requirements
- outline building code requirements
- design roof structure
- design both interior and exterior columns
- design lateral bracing
- design base plates
- present design information in appropriate graphical format
- employ the computer to check manual calculation of building beams and columns

III. REQUIRED RESOURCES/TEXTS/MATERIALS

Handbook of Steel Construction
Canadian Institute of Steel Construction

IV. METHOD OF EVALUATION (GRADING)

Students will be assigned a grade based on successful completion of tests and assignments, weighed as follows:

Assignments	30%
Two term tests each worth 20%	40%
Final Examination	30%
TOTAL	100%

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The course and curriculum are designed and limited to time based competency. Late assignments will receive a C (60%) grade maximum. Assignments more than seven days overdue will receive a grade of zero.

A final grade will be assigned as follows:

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

X A temporary grade limited to situations with extenuating circumstances, giving the student additional time to complete course requirements.

U	Unsatisfactory	(mid-term grade only)
S	Satisfactory	(mid-term grade only)

1. Minimum acceptable grade is 55%.
2. Each major assignment will carry equal weight.
3. Final examination will cover entire semester's work.
4. If at the end of the semester your overall average of combined assignments tests and final examination is below 55%, then it will be up to the instructor whether you receive an "R" grade or a rewrite. The criteria employed at arriving at that decision is class attendance, class participation and overall grade, which must be 45% or better.
5. If a rewrite is granted it will cover the entire semester course work and the maximum obtainable grade on the rewrite is a "C".

V. PRIOR LEARNING ASSESSMENT:

Students who wish for advanced credit in the course should consult the instructor.

VI. SPECIAL NOTES

Special Needs:

Students with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss accommodations confidentially with the instructor and/or contact the Special Needs Office, Room E1204, Ext. 493, 717, 491 so that support service can be arranged for you.

Testing Absence:

If the Student is unable to write a test on the date assigned, he/she shall follow the outlined procedure:

1. The student shall provide the Professor with advance notice preferably in writing of their need to miss the test.
2. The student may be required to document the absence at the discretion of the Professor.
3. All decisions regarding whether tests shall be re-scheduled will be at the discretion of the Professor.
4. The student is responsible to make arrangements, immediately upon return to the College with his/her course Professor related to make-up of the missed test prior to the next scheduled class for the course in question.
5. In the event of an emergency on the day of the test, the student may require documentation to support the absence and must telephone the College to identify the absence. The College has a 24 hour electronic voice system (759-2554 X587)

Failure to comply with these guidelines may result in a zero grade being recorded for the missed test.

Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for the possible future use in acquiring advanced standing at other post-secondary institutions.

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Substitute Courses:

Substitute Course information is available at the Registrar's office.

Modifications to Course Outline:

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