

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



Sault College

**COURSE OUTLINE**

**COURSE TITLE:** Structural Steel Design

**CODE NO. :** CIV 309 **SEMESTER:** Fall

**PROGRAM:** Civil Engineering Technology

**AUTHOR:** I.A.Finke

**DATE:** Sept. 2000 **PREVIOUS OUTLINE DATED:**

**APPROVED:**

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**DEAN**

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**DATE**

**TOTAL CREDITS:**

**PREREQUISITE(S):** MCH212 or MCH220

**HOURS/WEEK:** 4

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*For additional information, please contact Kitty Derosario, Dean  
School of Technology, Engineering & Technical Trades*

*(705) 759-2554, Ext.642*

**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 warehouse building.

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

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

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

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

Potential Elements of the Performance:

- Review shear and bending moment diagrams for simply supported beams
- Review flexure and shear formulas
- Determine factored loading on beams for given dead and live loads
- Identify major beam and connecting components of an actual building
- Identify major beam failure modes
- Review Class I,II,III,IV sections
- Review parameters in handbook for designing simply supported beams
- Review deflection requirements for typical buildings and calculate deflections using appropriate handbook equations
- Design laterally supported and laterally unsupported beams manually
- Design beams using Gravity Frame Design program
- Identify different 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 loading only
- Design columns with combined axial and bending loads
- Employ the Gravity Frame Design program to design columns

2. Possess working familiarity with the Handbook of Steel Construction
3. Understand the basic requirements that must be considered for design of a one-storey warehouse facility.

Potential Elements of the Performance:

- Outline general design requirements
- Review basic building code requirements
- Determine roof loading (dead and live loads)
- Design roof structure
- Design interior and exterior columns
- Design lateral bracing for wind loading
- Design Base Plates
- Present design information in a presentable graphical format
- Employ the Gravity Frame Design program to check the manual calculations of building beams and columns

**III. TOPICS:**

1. Design of Beams using Limit States Design
2. Design of Columns using Limit States Design
3. Design of an one storey steel building

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

**Handbook of Steel Construction**  
**Canadian Institute of Steel Construction**

**V. EVALUATION PROCESS/GRADING SYSTEM:**

Assignments	10%
Midterm Test	20%
Project	30%
Final Exam	40%

Each assignment carries equal weight. Late assignment submittals receive only a maximum grade of 60%. However, assignments handed in later than one week will receive a grade of 0%.

An average of 60% on the project and assignments, and 60% on tests is required for successful completion of this course.

The following semester grades will be assigned to students in postsecondary courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 - 100%	4.00
A	80 - 89%	3.75
B	70 - 79%	3.00
C	60 - 69%	2.00
R (Repeat)	59% or below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field placement or non-graded subject areas.	
U	Unsatisfactory achievement in field placement or non-graded subject areas.	
X	A temporary grade. This is used in limited situations with extenuating circumstances giving a student additional time to complete the requirements for a course (see <i>Policies &amp; Procedures Manual – Deferred Grades and Make-up</i> ).	
NR	Grade not reported to Registrar's office. This is used to facilitate transcript preparation when, for extenuating circumstances, it has not been possible for the faculty member to report grades.	

## VI. SPECIAL NOTES:

### Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1204 or call Extension 493, 717, or 491 so that support services can be arranged for you.

### Retention of course outlines:

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

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course outline amendments:

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

Testing Absence

If a student is unable to write a test on the date assigned, the following procedure is required:

- The student shall provide the Professor with advance notice preferably in writing of his/her need to miss the test.
- The student may be required to document the absence at the discretion of the Professor
- All decisions regarding whether tests shall be re-scheduled will be at the discretion of the Professor.
- 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.
- 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 mail system 759-2554 Ext.600.

**VII. PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

**VIII. DIRECT CREDIT TRANSFERS:**

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.