

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**

**COURSE OUTLINE**

**COURSE TITLE:** Structural Design

**CODE NO.:** CIV319 **SEMESTER:** VI

**PROGRAM:** Civil Engineering Technology

**AUTHOR:** D. J. Elliott

**DATE:** January, 1994 **PREVIOUS OUTLINE DATED:** \_\_\_\_\_

**APPROVED:** *L.P. Chaput*  
**DEAN**

*Jan/94*  
**DATE**

**STRUCTURAL DESIGN**  
**COURSE NAME**

**CIV319**  
**CODE NO.**

**TOTAL CREDIT HOURS** 64

**PREREQUISITES(S)** MCH212

**I. PHILOSOPHY/GOALS:**

This course will provide the student with a basic knowledge of the design of structural elements in wood, including beams, columns, walls, floor systems and connections. The design of wooden structures will be demonstrated by investigating a small commercial building.

**II. STUDENT PERFORMANCE OBJECTIVES:**

Upon successful completion of this course the student will:

- 1) Design structural elements in wood such as beams, columns, walls and floor systems
- 2) Demonstrate a working knowledge of applicable design manuals and codes
- 3) Apply the principles of Limit States design versus Working Stress design for wood structures
- 4) Design a small commercial building in wood
- 5) Utilize computer software for wood design

**III. TOPICS TO BE COVERED:**

- 1) Review of flexural and shear stresses, and Limit States design
- 2) Overview of the Wood Design Manual
- 3) Analysis and design of beams, columns, floors and walls in wood
- 4) Designing for deflection control
- 5) Building Code References
- 6) Computer Aided Design in wood

**IV. LEARNING ACTIVITIES:**

**REQUIRED RESOURCES:**

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- |   |  |
|---|--|
| 1. Introduction and Design Concepts <ul style="list-style-type: none"><li>- Materials</li><li>- Limit States Design</li><li>- Intro to small commercial building</li><li>- Loading</li><li>- Fire protection requirements</li></ul> | Wood Design Manual, lecture notes and handouts |
| 2. Glulam Beam Design <ul style="list-style-type: none"><li>- Flexural analysis and shear design</li><li>- beam selection</li></ul>   |  |
| 3. Tongue and Groove Decking <ul style="list-style-type: none"><li>- Loading</li><li>- Decking selection</li></ul>  |  |
| 4. Sawn Timber Roof Purlins <ul style="list-style-type: none"><li>- Flexural analysis and shear design</li><li>- member selection</li></ul>   |  |
| 5. Structural Composite Lumber Beam <ul style="list-style-type: none"><li>- Flexural analysis and shear design</li><li>- Deflection control</li></ul>   |  |
| 6. Wooden I-joist <ul style="list-style-type: none"><li>- Flexural analysis and shear design</li><li>- Deflection control</li></ul>   |  |
| 7. Glulam Columns   |  |
| 8. Exterior Bearing Stud Walls <ul style="list-style-type: none"><li>- Loading</li><li>- Shear, bending and deflection control</li></ul>  |  |
| 9. Connections <ul style="list-style-type: none"><li>- Bolted connection, column to beam</li></ul>  |  |
| 10. Roof Diaphragm and Chords <ul style="list-style-type: none"><li>- Sheathing design and selection</li></ul>  |  |
| 11. Shear Wall, Chords and Tiedown Connections <ul style="list-style-type: none"><li>- Sheathing design</li><li>- Stud wall selection</li><li>- Anchorage design</li></ul>  |  |



**V. METHOD OF EVALUATION:**

A final grade will be derived from the results of assignments and tests weighed as follows:

Assignments and Exercises	40 %
Tests (two @ 30%)	60 %
<b>TOTAL</b>	<b>100 %</b>

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) Students obtaining a composite grade below 55% may be allowed to complete a supplementary examination. Eligibility for a rewrite will be based on class participation, attendance and overall grade, which should be at least 45%.
- 3) When a rewrite is granted, the maximum obtainable grade in the course will be 60%.

**VI. REQUIRED STUDENT RESOURCES:**

Canadian Wood Council; Wood Design Manual; 1990

**VII. SPECIAL NOTES:**

Students with special needs (eg. physical limitations, visual impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

The instructor reserves the right to modify the course as required to meet the needs of the students.