

SAULT STE. MARIE, ON  
SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

COURSE OUTLINE

COURSE TITLE: HIGHWAY ENGINEERING

CODE NO.: CIV316 SEMESTER: VI

PROGRAM: CIVIL ENGINEERING TECHNOLOGY

AUTHOR: D. J. ELLIOTT

DATE: JANUARY, 1996 PREVIOUS OUTLINE DATED: JAN. 1995

APPROVED: *D. J. Elliott* 96-01-02  
DEAN DATE

**HIGHWAY ENGINEERING**  
COURSE NAME

**CIV316**  
COURSE CODE

**TOTAL CREDIT HOURS:** 64

**PREREQUISITE(S):** SUR201

**I. PHILOSOPHY/GOALS:**

This course will introduce the student to fundamental concepts in the field of transportation engineering. The student will develop a working knowledge of road classification, level of service, traffic study, highway geometrics and intersection design. Computer and survey applications will be discussed when appropriate.

**II. STUDENT PERFORMANCE OBJECTIVES (OUTCOMES):**

Upon successful completion of this course the student will:

- 1) Describe fundamental transportation concepts
- 2) Classify roads with respect to conditions, service and safety
- 3) Describe basic issues associated with traffic study
- 4) Apply geometric and associated design criteria to highway design
- 5) Apply criteria for the design of intersections

**III. TOPICS TO BE COVERED:**

- 1) Introduction
- 2) Classification and Capacity
- 3) Basic Traffic Study
- 4) Highway Geometrics and Design
- 5) Intersections

**IV. LEARNING ACTIVITIES/REQUIRED RESOURCES**

**1. Introduction**

**Learning Activities:** In class instruction and problem sets on the fundamental concepts of highway engineering and transportation design

**Resources:** TAC Manual  
Khisty, chapter 1

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**2. Classification and Capacity**

**Learning Activities:** In class instruction and problem sets on:  
- conditions  
- level of service  
- safety

**Resources:** TAC Manual, Chapters A and G  
MTO Geometric Design Manual

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**3. Basic Traffic Study**

**Learning Activities:** In class instruction and problem sets on:  
- Traffic study  
- Traffic flow models

**Resources:** McShane and Roess, Chapter 5

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**4. Highway Geometrics and Design**

**Learning Activities:** In class instruction and problem sets on:  
- design elements  
- horizontal and vertical alignment, including spirals  
- superelevation  
- cross section elements  
- sight distances  
- drainage  
- pavement design  
- traffic barriers

**Resources:** Kavanagh, chapter 12  
TAC Manual, Chapters B, C and F  
MTO Geometric Design Manual

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**5. Intersections**

**Learning Activities:** In class instruction and problem sets on:  
- types of intersections  
- controls  
- at-grade intersections  
- grade separated intersections

**Resources:** TAC Manual, Chapter D  
MTO Geometric Design Manual

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**V. EVALUATION METHODS: (INCLUDES ASSIGNMENTS, ATTENDANCE REQUIREMENTS, ETC.)**

A final grade will be derived as follows:

Assignments	40%
Term Tests (2@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) Late assignments will be penalized 10% for each day late.
- 2) Minimum acceptable grade for this course is 55%.
- 3) If at the end of the semester the overall mark is below 55%, then it will be up to the instructor whether or not a rewrite test will be granted. The criteria employed for arriving at that decision is class attendance, class participation and overall grade, which must be at least 45%.
- 4) In the case a rewrite is granted, it will be permitted only once, it will cover the entire course outline and will limit the maximum obtainable grade for the course to 60%.

**VI. REQUIRED STUDENT RESOURCES**

**Required Text**                      **Transportation Association of Canada; Geometric Design Guide for Canadian Roads**

**VII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY:**

**Book Section**                      **Kavanagh, Barry F.; Surveying with Construction Applications, Prentice Hall**

**Ministry of Transportation; Geometric Design Standards for Ontario Highways, Queen's Printer**

**Ministry of Transportation and Municipal Engineers Association; Ontario Provincial Standard Drawings and Specifications**

**Khisty, Jotin C., Transportation Engineering, An Introduction, Prentice Hall**

**McShane, W. R. and Roess, R. P.; Traffic Engineering, Prentice Hall**



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**VIII. SPECIAL NOTES**

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

Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of students.

