

**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, 1995 **PREVIOUS OUTLINE DATED:** JAN. 1994

**APPROVED:** *L.P. Cleary* 95-01-03  
**DEAN** **DATE**

*M. Uman*  
*Jan 3/95*

**HIGHWAY ENGINEERING**  
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**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:** Khisty, chapter 1  
TAC Manual

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**2. Classification and Capacity**

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

**Resources:** Khisty, chapter 7 and 16  
TAC Manual  
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:** Khisty, 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:** Khisty, chapter 6  
Kavanagh, chapter 12  
TAC Manual  
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:** Khisty, chapters 8 and 9  
TAC Manual  
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%)	<u>60%</u>
	Total	100%

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

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

Book Section Transportation Association of Canada; Geometric Design Guide for Canadian Roads

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

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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.

