

**STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK**



MASTER SYLLABUS

CONS 372– Highways and Transportation

CIP Code: 15.0201

Created by: Robert R Blickwedehl

Updated by: Adrienne C. Rygel

**School: Canino School of Engineering Technology
Department: Civil and Construction Technology
Implementation Semester/Year: Fall 2024**

A. TITLE: Highways and Transportation

B. COURSE NUMBER: CONS 372

C. CREDIT HOURS (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity):

# Credit Hours per Week	3
# Lecture Hours per Week	2
# Lab Hours per Week	2
Other per Week	

D. WRITING INTENSIVE COURSE:

Yes	
No	x

E. GER CATEGORY:

Does course satisfy a GER category(ies)? If so, please select all that apply.

[1-2] Communication	
[3] Diversity: Equity, Inclusion & Social Justice	
[4] Mathematics & Quantitative Reasoning	
[5] Natural Science & Scientific Reasoning	
[6] Humanities	
[7] Social Sciences	
[8] Arts	
[9] US History & Civic Engagement	
[10] World History & Global Awareness	
[11] World Languages	

F. SEMESTER(S) OFFERED:

Fall	x
Spring	
Fall and Spring	

G. COURSE DESCRIPTION:

This course covers the design of horizontal and vertical highway alignments in accordance with American Association of State Highway and Transportation Officials (AASHTO) requirements from survey data, topographic maps and traffic data. Analysis of alternate plans using benefit cost ratios based on road user costs and first costs are included. Setting of traffic light timing for optimum traffic flow and design of parking is introduced.

H. PRE-REQUISITES: CONS 101 Elementary Surveying

CO-REQUISITES: None

I. STUDENT LEARNING OUTCOMES:

Course Student Learning Outcome [SLO]	Program Student Learning Outcome [PSLO]	GER	ISLO & Subsets
a. Design the horizontal and vertical alignment for a highway	SO 2		ISLO 5
b. Design a pavement for given traffic load and soil conditions	SO 2		ISLO 5
c. Design an at grade intersection	SO 2		ISLO 5
d. Determine the capacity of a section of highway	SO 2		ISLO 2 (PS) and ISLO 5
e. Determine the timing for traffic lights on a section of street	SO 2		ISLO 2 (PS) and ISLO 5
f. Compare the benefits and costs of different modes of transportation	SO 1		ISLO 2 (PS) and ISLO 4

KEY	<u>Institutional Student Learning Outcomes</u> <u>[ISLO 1 – 5]</u>
ISLO #	ISLO & Subsets
1	Communication Skills Oral [O], Written [W]
2	Critical Thinking <i>Critical Analysis [CA], Inquiry & Analysis [IA], Problem Solving [PS]</i>
3	Foundational Skills <i>Information Management [IM], Quantitative Lit, /Reasoning [QTR]</i>
4	Social Responsibility <i>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</i>
5	Industry, Professional, Discipline Specific Knowledge and Skills

J. APPLIED LEARNING COMPONENT:

Yes	x
No	

If yes, select [X] one or more of the following categories:

Classroom / Lab	x	Community Service	
Internship		Civic Engagement	
Clinical Practicum		Creative Works/Senior Project	
Practicum		Research	
Service Learning		Entrepreneurship [program, class, project]	

K. TEXTS:

Garber, Nicholas J. and Hoel, Lester A. (2008) Traffic and Highway Engineering, 3rd Edition, Pacific Grove, CA: Brooks/Cole Publishing Company. or Mannering, F.L.,

Or

Washburn, S.S. and Kilareski, W.P (2009) Principles of Highway Engineering and Traffic Analysis, 4th Edition. Wiley

Or

Fricker, J. D. and Whitford, R.K. (2005) Fundamentals of Transportation Engineering: A Multimodal Systems Approach. Pearson

L. REFERENCES:

A Policy on Geometric Design of Highways and Streets, 5th Edition. American Association of State Highway and Transportation Officials

M. EQUIPMENT:

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

Exams

Quizzes

Design Project(s)

Homework

P. DETAILED COURSE OUTLINE:

I. Overview of transportation engineering

A. The profession of transportation engineering

B. Safety considerations

C. Environmental and social considerations

D. Organizations and administration

E. Introduction to travel demand forecasting

II. Geometric design of highways

- A. Roadway characteristics and classifications
- B. Highway design factors
- C. The physics of vehicular turning and stopping
- D. Driver reactions and sight considerations
- E. Vertical alignment
- F. Horizontal alignment

III. At grade intersections

- A. Capacity and level of service determination
- B. Geometric design
- C. Traffic control devices
- D. Introduction to roundabouts

IV. Pavement design

- A. Review of soils and materials courses
- B. Rigid pavement design
- C. Flexible pavement design
- D. Measurement of pavement performance

V. Traffic flow

- A. General concepts
- B. Queuing theory
- C. Capacity and level of service
- D. Intersection signalization
- E. Traffic signal timing

Q. **LABORATORY OUTLINE:**

The 2 hour lab session will not be used to engage the student in lengthy problem solutions associated with current lecture topics.