

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



MASTER SYLLABUS

**COURSE NUMBER – COURSE NAME
CONS372 - HIGHWAYS AND TRANSPORTATION**

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Updated by: JFR 2015, 2018

Canino School of Engineering Technology

Department: DEPARTMENT OF CIVIL AND CONSTRUCTION TECHNOLOGY

Semester/Year: S/2018

- A. **TITLE:** Highways and Transportation
- B. **COURSE NUMBER:** CONS372
- C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)
Credit Hours: 3
Lecture Hours: 2 per week

Lab Hours: per week
 Other: 2 hours recitation per week

Course Length: 15 Weeks
- D. **WRITING INTENSIVE COURSE:** Yes No
- E. **GER CATEGORY:** None: Yes: GER
If course satisfies more than one: GER
- F. **SEMESTER(S) OFFERED:** Fall Spring Fall & 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:** None Yes If yes, list below:

CONS 203 (Advanced Surveying), CONS 380(Civil Engineering Materials)

CO-REQUISITES: None Yes If yes, list below:

I. STUDENT LEARNING OUTCOMES: (see key below)

By the end of this course, the student will be able to:

<u>Course Student Learning Outcome</u> <u>[SLO]</u>	<u>Program Student Learning Outcome</u> <u>[PSLO]</u>	<u>GER</u> <i>[If Applicable]</i>	<u>ISLO & SUBSETS</u>	
Design the horizontal and vertical alignment for a highway	1a, 4a		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
Design a pavement for given traffic load and soil conditions	1a, 4a		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
Design an at grade intersection	1a, 4a		5-Ind, Prof, Disc, Know Skills ISLO ISLO	Subsets Subsets Subsets Subsets
Determine the capacity of a section of highway	1a, 6a, 10		5-Ind, Prof, Disc, Know Skills 2-Crit Think ISLO	Subsets CA Subsets Subsets
Determine the timing for traffic lights on a section of street	1a, 6b, 9a, 10		5-Ind, Prof, Disc, Know Skills 2-Crit Think ISLO	Subsets PS Subsets Subsets
Compare the benefits and costs of different modes of transportation	1a, 10		5-Ind, Prof, Disc, Know Skills 4-Soc Respons ISLO	Subsets ER Subsets Subsets

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KEY	<u>Institutional Student Learning Outcomes [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

*Include program objectives if applicable. Please consult with Program Coordinator

J. **APPLIED LEARNING COMPONENT:** Yes No

If YES, select one or more of the following categories:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Classroom/Lab | <input type="checkbox"/> Civic Engagement |
| <input type="checkbox"/> Internship | <input type="checkbox"/> Creative Works/Senior Project |
| <input type="checkbox"/> Clinical Placement | <input type="checkbox"/> Research |
| <input type="checkbox"/> Practicum | <input type="checkbox"/> Entrepreneurship |
| <input type="checkbox"/> Service Learning | (program, class, project) |
| <input type="checkbox"/> Community Service | |

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., 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:** None Needed:

N. **GRADING METHOD:** A - F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

Exams 50%

Assignments

Quizzes

Projects

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: None Yes