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

MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
CONS372 - HIGHWAYS AND TRANSPORTATION

Created by: Robert R. Blickwedehl
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:

<table>
<thead>
<tr>
<th>Course Student Learning Outcome [SLO]</th>
<th>Program Student Learning Outcome [PSLO]</th>
<th>GER [If Applicable]</th>
<th>ISLO &amp; SUBSETS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design the horizontal and vertical alignment for a highway</td>
<td>1a, 4a</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO</td>
<td>Subsets Subsets Subsets Subsets</td>
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<td>Design a pavement for given traffic load and soil conditions</td>
<td>1a, 4a</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO</td>
<td>Subsets Subsets Subsets Subsets</td>
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<td>Design an at grade intersection</td>
<td>1a, 4a</td>
<td>5-Ind, Prof, Disc, Know Skills ISLO ISLO</td>
<td>Subsets Subsets Subsets Subsets</td>
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<tr>
<td>Determine the capacity of a section of highway</td>
<td>1a, 6a, 10</td>
<td>5-Ind, Prof, Disc, Know Skills 2-Crit Think ISLO</td>
<td>Subsets CA Subsets Subsets</td>
</tr>
<tr>
<td>Determine the timing for traffic lights on a section of street</td>
<td>1a, 6b, 9a, 10</td>
<td>5-Ind, Prof, Disc, Know Skills 2-Crit Think ISLO</td>
<td>Subsets PS Subsets Subsets</td>
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<td>Compare the benefits and costs of different modes of transportation</td>
<td>1a, 10</td>
<td>5-Ind, Prof, Disc, Know Skills 4-Soc Respons ISLO</td>
<td>Subsets ER Subsets Subsets</td>
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<td>ISLO #</td>
<td>Institutional Student Learning Outcomes [ISLO 1 – 5]</td>
<td>ISLO &amp; Subsets</td>
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<td>1</td>
<td>Communication Skills</td>
<td>Oral [O], Written [W]</td>
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<td>2</td>
<td>Critical Thinking</td>
<td>Critical Analysis [CA], Inquiry &amp; Analysis [IA], Problem Solving [PS]</td>
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<td>3</td>
<td>Foundational Skills</td>
<td>Information Management [IM], Quantitative Lit./Reasoning [QTR]</td>
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<td>4</td>
<td>Social Responsibility</td>
<td>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</td>
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<tr>
<td>5</td>
<td>Industry, Professional, Discipline Specific Knowledge and Skills</td>
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</table>

*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:

- [X] Classroom/Lab
- [□] Internship
- [□] Clinical Placement
- [□] Practicum
- [□] Service Learning
- [□] Community Service
- [□] Civic Engagement
- [□] Creative Works/Senior Project
- [□] Research
- [□] Entrepreneurship
  (program, class, project)

K. **TEXTS:**


or


or

Multimodal Systems Approach. Pearson

L. **REFERENCES:**

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 ☐