COURSE OUTLINE

CONS 372 – HIGHWAYS AND TRANSPORTATION

Prepared By:  Robert R. Blickwedehl
CONS 372 – HIGHWAYS AND TRANSPORTATION

A. TITLE: Highways and Transportation

B. COURSE NUMBER: CONS 372

C. CREDIT HOURS: 3

D. WRITING INTENSIVE COURSE: No

E. COURSE LENGTH: 15 Weeks

F. SEMESTER(S) OFFERED: Spring

G. HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY: 3 lecture hours per week

H. CATALOG 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.

I. PRE-REQUISITES/CO-COURSES:
   a. Pre-requisites: CONS 203 (Advanced Surveying), CONS 380(Civil Engineering Materials)

J. GOALS (STUDENT LEARNING OUTCOMES):
By the end of this course, the student will be able to:

<table>
<thead>
<tr>
<th>Course Objective</th>
<th>Institutional SLO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Design the horizontal and vertical alignment for a highway</td>
<td>2. Critical Thinking</td>
</tr>
<tr>
<td></td>
<td>3. Professional Competence</td>
</tr>
<tr>
<td>2. Design a pavement for given traffic load and soil conditions</td>
<td>2. Critical Thinking</td>
</tr>
<tr>
<td></td>
<td>3. Professional Competence</td>
</tr>
<tr>
<td>3. Design an at grade intersection</td>
<td>2. Critical Thinking</td>
</tr>
<tr>
<td></td>
<td>3. Professional Competence</td>
</tr>
<tr>
<td>4. Determine the capacity of a section of highway</td>
<td>2. Critical Thinking</td>
</tr>
<tr>
<td></td>
<td>3. Professional Competence</td>
</tr>
<tr>
<td>5. Determine the timing for traffic lights on a section of street</td>
<td>2. Critical Thinking</td>
</tr>
<tr>
<td></td>
<td>3. Professional Competence</td>
</tr>
<tr>
<td>6. Compare the benefits and costs of different modes of transportation</td>
<td>2. Critical Thinking</td>
</tr>
<tr>
<td></td>
<td>3. Professional Competence</td>
</tr>
</tbody>
</table>

K. TEXTS:

or

or


L. **REFERENCES:**


M. **EQUIPMENT:** Technology enhanced classroom

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

N. **MEASUREMENT CRITERIA/METHODS:**

• Exams
• Quizzes
• Research papers
• 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:**