College of Engineering

Department of Civil Engineering

CE 536 Advanced Geometric Design of Highways

Credit and Contact hours	3/ 3 (Lectures), 0 (Tutorials), 0 (Laboratory)
Required, or Elective	Required for a MSCE degree
Course Description	Design designations and criteria. Integration between horizontal and vertical alignments. At-grade intersections; types and design elements. Interchanges: types and design elements. Design of parking facilities and appurtenances. Surface Drainage. Safety considerations.
Prerequisites or Co-requisites	None
Course Learning Outcomes	Students completing this course successfully will be able to

Course Learning Outcomes	***Related Program Outcomes***
CLO1: Recognize the concepts of highway geometric design and how to design and integrate the vertical and horizontal alignments of highways taking into consideration various factors that control the design.	**K1**
CLO2: Develop design criteria and inputs needed for highway design	**S1**
CLO3: Design highway cross section elements and vertical and horizontal alignments using Autocad based softwares	**S1**
CLO4: Evaluate the performance of existing highways in real life projects	**C2**

Student Outcomes related to this Course	**K1**. Recognize advanced engineering knowledge, concepts and techniques to identify, interpret and analyze complex and real-life engineering problems.

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<tr><td></td><td>S1. Provide solution for complex and real-life engineering problems through critical thinking and using modern engineering tools and identify its impact on social and ethical issues.

C2. Design novel advanced Civil Engineering systems and evaluate its performance and effectiveness for engineering practice and its impact on society.</td></tr>
<tr><td>Topics Covered</td><td>
<table>
<tr><th>List of Topics</th><th>Related CLOs</th></tr>
<tr><td>1. Introduction to CE 536</td><td>CLO1</td></tr>
<tr><td>2. Highway Functions & Design controls</td><td>CLO2</td></tr>
<tr><td>3. Sight distances</td><td>CLO2</td></tr>
<tr><td>4. Highway Vertical Alignment</td><td>CLO3</td></tr>
<tr><td>5. Highway Horizontal Alignment</td><td>CLO3</td></tr>
<tr><td>6. At grade intersection</td><td>CLO3</td></tr>
<tr><td>7. Interchanges</td><td>CLO3</td></tr>
<tr><td>8. Highway location and planning</td><td>CLO4</td></tr>
<tr><td>9. Highway facilities (Bridges, parking lots)</td><td>CLO2</td></tr>
<tr><td>10. Drainage</td><td>CLO2</td></tr>
<tr><td>11. Hwy crossings</td><td>CLO1</td></tr>
<tr><td>12. Design Products & Process</td><td>CLO1</td></tr>
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<tr><td>Textbook(s) and Other Required Material</td><td>• A Policy on Geometric Design of Highways and Streets, AASHTO, 6th Edition (2011) or later.</td></tr>
<tr><td>Grading System</td><td>Assignments 20%
Project Work 20%
Midterm Exam 30%
Final Exam 40%</td></tr>
<tr><td>Instructors</td><td>Ali Alsahli (2A26), e-mail: adalsahli@ksu.edu.sa</td></tr>
<tr><td>Date of Review</td><td>February, 2021</td></tr>
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