College of Engineering

Department of Civil Engineering

CE 513 Construction Engineering

Credit and Contact hours	3/ 3 (Lectures), 0 (Tutorials), 0 (Laboratory)
Required, or Elective	Required for a MSCE degree
Course Description	Introduction to the economics, utilization and limitations of large-scale horizontal construction methods. Advanced study of planning, analysis, and methods improvement techniques as applied to public works and energy facilities construction. Emphasizes computer simulation of construction operations and time lapse analysis.
Prerequisites or Co-requisites	None
Course Learning Outcomes	Students completing this course successfully will be able to

Course Learning Outcomes	***Related Program Outcomes***
CLO1: Acquire in-depth knowledge of factors affecting the construction industry; construction management issues; construction safety; and productivity improvement	**K1**
CLO2: Recognize design principles of concrete formwork; design concrete formwork; construction economics; and determine equipment operation and maintenance costs	**K1**
CLO3: Apply advanced techniques and tools to determine the characteristics of soil volume change, earthwork volume and mass diagram using different earthmoving materials.	**S1**
CLO4: Determine productivity of earthmoving equipment for excavating, lifting, loading, hauling, compacting, and finishing.	**S1**

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.</td></tr>
<tr><td>Topics Covered</td><td>
<table>
<tr><th>List of Topics</th><th>Related CLOs</th></tr>
<tr><td>1. Introduction</td><td>CLO1</td></tr>
<tr><td>2. Equipment Economics</td><td>CLO2</td></tr>
<tr><td>3. Planning for Earthwork Construction</td><td>CLO3</td></tr>
<tr><td>4. Soil and Rock</td><td>CLO3</td></tr>
<tr><td>5. Compaction and Stabilization Equipment</td><td>CLO4</td></tr>
<tr><td>6. Mobile Equipment Power Requirements</td><td>CLO4</td></tr>
<tr><td>7. Dozers</td><td>CLO4</td></tr>
<tr><td>8. Scrapers</td><td>CLO4</td></tr>
<tr><td>9. Excavators</td><td>CLO4</td></tr>
<tr><td>10. Trucks and Hauling Equipment</td><td>CLO4</td></tr>
<tr><td>11. Finishing Equipment</td><td>CLO4</td></tr>
<tr><td>12. Cranes</td><td>CLO4</td></tr>
<tr><td>13. Concrete Formwork</td><td>CLO2</td></tr>
<tr><td>14. Belt Conveyor System</td><td>CLO2</td></tr>
<tr><td>15. Sheet Pile design</td><td>CLO2</td></tr>
</table>
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<tr><td>Textbook(s) and Other Required Material</td><td>R. L. Peurifoy, C. J. Schexnayder, A. Shapira, and R Schmitt, Construction Planning, Equipment, and Methods, McGraw-Hill PublishingCompany</td></tr>
<tr><td>Grading System</td><td>Assignments 10%
Lecture Attendance 5%
Project Work 25%
Midterm Exam 20%
Final Exam 40%</td></tr>
<tr><td>Instructors</td><td>Khalid S. Al-Gahtani, Associate professor, office# 2 A 15, email: kgahtani@ksu.edu.sa, Website: https://fac.ksu.edu.sa/kgahtani</td></tr>
<tr><td>Date of Review</td><td>February, 2021</td></tr>
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