

CE 417
CONSTRUCTION EQUIPMENT AND METHODS
September 01, 2020

Department of Civil Engineering
King Saud University

Course Description: CE 417 Construction Equipment and Methods (Required for a BSCE degree)	Introduction to the principles of construction productivity including Earthmoving equipment and material and Construction Operations. Covered also, is the Design of Concrete Formworks, Construction Economics, and Construction Safety and Ethics, and improving labour total productivity. 3 (3,1,0)		
Prerequisite	Eighth level		
Course learning Outcomes	<ol style="list-style-type: none"> 1. Understand earthmoving material and soil volume change characteristics; and determine earthwork volume and mass diagram. 2. Determine productivity of earthmoving equipment for excavating, lifting, loading, hauling, compacting, and finishing.. 3. Understand design principles of concrete formwork; design concrete formwork; understand construction economics .and determine equipment operation and maintenance costs 4. Understand construction safety, health hazards, ethical responsibility, and labor productivity 		
Topics Covered	No	Topic	Reading Assignment
	1	Introduction	Ch. 1
	2	Ethics	Softcopy Hand out
	3	Earthmoving Materials and Operations	Ch. 2
	4	Excavating and Lifting	Ch. 3
	5	Loading and Hauling	Ch. 4
	6	Compacting and Finishing	Ch. 5
	7	General Safety	Softcopy Hand out
	8	Concrete Form Design	Ch. 12
	9	Construction Economics	Ch. 17
	11	Construction Safety	Ch. 19
	12	Improving Productivity and Performance	Ch. 20
Class/ tutorial Schedule	Class is held three times per week in 50-minute lecture sessions. There is also a 50-minute weekly tutorial associated with this course.		
Computer Applications	Commercial and educational simulation software is encouraged to be used during the course.		
Course Project	A course group project from five students is asked to choose a live construction project and present their work by the end of the semester.		
Contribution of Course to Meeting the Professional Component	Students recognize the role of professional societies in developing knowledge of measuring construction productivity and improving performance.		

Textbook(s) and/or Other Required Material	<i>S.W. Nunnally, Construction Methods and Management, Eighth Edition, 2014, Prentice-Hall, Inc.</i>	
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Date of Preparation	January 12, 2018	

Grade Distribution:

First Mid Term Exam	20%
Second Mid Term Exams	20%
Research Project	7%
Tutorial	10%
Student Paricipation	3%
Final Exam	40%

Table: Mapping Course Learning Outcomes against Student Outcomes

CE 417 Construction Equipment and Methods 3(3,1,0)	SO1	SO2	SO3	SO4	SO5	SO6	SO7	SO8	SO9	SO10	SO11	SO12	SO13
Recognize earthmoving material and soil volume change characteristics and Calculate earthwork volume and mass diagram	4												
Estimate productivity of earthmoving equipment for excavating, lifting, loading, hauling, compacting and finishing.	4							3					
Identify construction safety, health hazards, and ethical responsibility.						4			3				
Conduct Course Research Project on a real construction site project in relation to construction equipment selection, productivity and other related to the course learning outcomes.	4								3				
Summary Total = 25	12					4		3	6				
Credit Hour Distribution	1.44					0.48		0.36	0.75				

The Student Outcomes (SOs) were originally developed in 2006 and were periodically checked and updated to satisfy the updated ABET Criteria for Engineering Program (a to k), and the ASCE Civil Engineering Program criteria (2014). The list of the SOs is as follows:

- SO1. An ability to apply knowledge of mathematics, science, and engineering [ABET a]
- SO2. An ability to design and conduct experiments, as well as to analyze and interpret data [ABET b]
- SO3. An ability to design a system, component, or process to meet desired needs with realistic constraints such as economic, environmental, social, ethical, health and safety, and sustainability. [ABET c]
- SO4. An ability to function on multi-disciplinary teams [ABET d]
- SO5. An ability to identify, formulate, and solve engineering problems [ABET e] including the ability to evaluate and synthesize information and develop alternative solutions
- SO6. An understanding of professional and ethical responsibility [ABET f].
- SO7. An ability to articulate professional ideas clearly and prepare written materials, graphical communications and make oral presentations [ABET g].
- SO8. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context for serving the society [ABET h]
- SO9. A recognition of the need for, and an ability to engage in life-long learning [ABET i]
- SO10. A knowledge of contemporary issues [ABET j]
- SO11. An ability to use the techniques, skills and modern engineering tools necessary to civil engineering practice [ABET k].
- SO12. An ability to understand and explain the key concepts used in management, business, public policy, public administration, leadership principles, and licensure. [ASCE 2014 – CE Program Criteria]
- SO13. Understanding of at least one area of natural sciences, such as geology, ecology, or biology. [ASCE 2014 – CE Program Criteria]

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