Course Specification

(Bachelor)

Course Title:	Construction Equipment's and Methods
Course Code:	COE4404
Program:	Bachelor of Construction Engineering
Department:	Civil and Environmental Engineering Department
College:	College of Engineering and Computing in Al-Qunfudhah
Institution:	Umm Al-Qura University
Version:	4th
Last Revision Date:	15th January 2025

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
2. Course type					
A.	☐University	☐ College	☒ Department	☐Track	Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (Level 7/year 4)					
4. Course General Description:					
The "Construction Equipment and Methods" course is designed for students in the Bachelor's program in Construction Engineering to explore the efficient use and management of construction equipment. The course addresses the selection of the appropriate machinery for specific tasks and the methods employed to maximize productivity and ensure safety on construction sites. Students will learn about different types of equipment, operational techniques, and how machinery integrates with construction processes to improve project efficiency.					
5. Pre-requirements for this course (if any)**:**					
Building Construction (COE3402)					
6. Co-requisites for this course (if any)**:**					
7. Course Main Objective(s):					
1. To introduce students to various types of construction equipment and their applications. 2. To understand the criteria for selecting the right equipment for different construction tasks. 3. To develop knowledge on the economic factors influencing equipment usage and selection. 4. To examine the operational techniques for efficient and safe equipment use. 5. To study the maintenance practices necessary for ensuring equipment longevity and reliability. 6. To explore the latest trends and technologies in construction machinery.					

7. To learn about environmental and regulatory considerations in equipment management.
8. To enhance problem-solving skills related to equipment management and optimization.
9. To prepare students for managing equipment resources in real construction projects.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	**3 credit hours**	**100%**
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		**45**

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Describe the types, capabilities, and applications of	**K1**	**Interactive learningSelf-directed learning**	**Midterm Exam, Final Exam, Homework, and Quizes**

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	construction equipment and outline the principles of equipment selection, productivity estimation, and construction methods used in various engineering projects.			
1.2	Define the behavior and operational principles of construction equipment used for excavation, lifting, and material handling, and identify factors affecting their efficiency and performance in various construction methods.	**K1**	**Interactive learningSelf-directed learning**	**Midterm Exam, Final Exam, Homework, and Quizes**
2.0	**Skills**			
2.1	**Apply engineering and scientific principles to identify, analyze, and solve complex construction engineering problems.**	**S1**	**Interactive learning Self-directed learning**	**Midterm Exam, Final Exam, Homework, and Quizes**
2.2	**Utilize critical thinking skills to analyze complex construction engineering issues**		**Interactive learning Self-directed learning**	**Midterm Exam, Final Exam, Homework, and Quizes**

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	and develop innovative, context-appropriate solutions that address current challenges in the field.	S2		
...				
3.0	Values, autonomy, and responsibility			
3.1				
3.2				
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Construction Equipment	3
2.	Equipment Selection and Productivity	6
3.	Earthmoving and Excavation Equipment	3
4.	Lifting and Material Handling Equipment	3
5.	Concrete and Asphalt Equipment	3
6.	Mid Term Exam	3
7.	Equipment Economics and Cost Analysis	6
8.	Maintenance and Safety of Construction Equipment	6
9.	Innovations in Construction Equipment	6
10.	Case Studies in Equipment Management	6
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	4, 6, 12	15%
2.	Homework	3, 9, 13	15%
3.	Midterm Exam	8	30%
4.	Final Exam	16 or 17	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Peurifoy, R.L., Schexnayder, C.J., Shapira, A. and Schmitt, R., 2023. *Construction Planning, Equipment, and Methods*. 9th ed. New York: McGraw-Hill.
Supportive References	Halpin, D.W., Senior, B.A. and Lucko, G., 2022. *Heavy Construction Planning, Equipment, and Methods*. 4th ed. Hoboken: Wiley.
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with minimum capacity of 30 students
Technology equipment (projector, smart board, software)	Projector, whiteboard
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Lecturer / Students	Direct / Indirect (Grades, surveys)

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of Students assessment	Faculty	Indirect (Barriers to understand successor course)
Quality of learning resources	Lecturer	Direct (Grades)
The extent to which CLOs have been achieved	Lecturer / Faculty	Direct (Grades)
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**Civil and Environmental Engineering Department Council in Al-Qunfudah**
REFERENCE NO.	**The fifteenth session of the academic year 1446**
DATE	**01/05/2025**