Course Specification

(Bachelor)

Course Title:	Engineering Economy
Course Code:	COE2002
Program:	Bachelor of Construction Engineering
Department:	Civil and Environmental Engineering Department
College:	College of Engineering and Computing in Al-Qunfudhah
Institution:	Umm A
Version:	4th
Last Revision Date:	15th January 2025

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A. General information about the course:

1. Course Identification

1. Credit hours: (2)					
2. Course type					
A.	☐University	☒ College	☐Department	☐Track	Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (Level 4/year 2)					
4. Course General Description:					
Engineering Economy is a crucial course for construction engineering students, focusing on the economic aspects of engineering decisions. The course provides foundational knowledge in evaluating and comparing the financial implications of engineering projects, considering costs, benefits, and the time value of money. It equips students with the necessary tools and methodologies to make informed economic decisions in the context of construction projects. This course combines engineering principles with economic theory to enhance decision-making skills specific to construction engineering challenges.					
5. Pre-requirements for this course (if any)**:**					
Calculus (2) for Engineering (MTH1182)					
6. Co-requisites for this course (if any)**:**					
7. Course Main Objective(s):					
1. To understand the fundamental concepts of engineering economy. 2. To develop skills in economic decision-making and analysis relevant to construction projects. 3. To apply the principles of cost estimation, budgeting, and financial analysis in construction engineering. 4. To evaluate different financial alternatives using time value of money concepts. 5. To incorporate risk and uncertainty factors into economic evaluations. 6. To enhance the ability to justify and present economic analysis in support of engineering projects.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	**2 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**	30
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		**30**

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	Master fundamental construction engineering concepts, principles, theories, and procedures, including recall, definition, and description.	**K1**	**Interactive learning** **Self-directed learning**	**Midterm Exam, Final Exam, Homework, and Quizes**
1.2	Grasp the foundational principles of physics, mathematics, and engineering techniques	**K2**	**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
	as applied within the field of construction engineering. *This includes understanding the concepts of the time value of money and interest rates.				
1.3	Demonstrate a comprehensive understanding of specialized knowledge by analyzing and interpreting current advancements in innovative construction technologies. Illustrate comprehension of research methodologies and inquiry techniques relevant to investigating complex construction engineering problems.	**K3**		**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 effectively solve complex construction engineering problems	**S1**	**Interactive learningSelf-directed learning**	**Midterm Exam, Final Exam, Homework, and Quizes**	
2.2	Employ critical thinking skills to dissect complex construction engineering issues and develop innovative, context-appropriate solutions that address current challenges.	**S2**	**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
2.3	Design and conduct experiments, interpret resulting data, and utilize statistical and engineering tools to generate valid and reliable conclusions	**S3**	**Interactive learningSelf-directed learning**	**Midterm Exam, Final Exam, Homework, and Quizes**	
3.0	**Values, autonomy, and responsibility**				
3.1	Demonstrate responsibility and ethical practices when evaluating the societal, environmental, and economic impacts of construction engineering decisions	**V1**	**Interactive learningSelf-directed learning**	**Midterm Exam, Final Exam, Homework, and Quizes**	
3.2	Plan and achieve academic and professional self-development in construction engineering by assessing personal learning and performance, making evidence-based decisions, and actively contributing to the advancement of the field and its societal impact	**V2**			
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C. Course Content

No	List of Topics	Contact Hours
1.	**Introduction to Engineering Economy**	**2**
2.	**The Time Value of Money**	**4**
3.	**Economic Decision-Making**	**6**
4.	**Project Cash Flow Analysis**	**6**
5.	**Cost Estimation and Budgeting**	**2**

6.	Mid Term Exam	2
7.	Depreciation and Tax Considerations	2
8.	Inflation and Price Change	2
9.	Risk and Uncertainty in Economic Analysis	2
10.	Ethics and Sustainability in Economic Analysis	2
Total		30

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	Sullivan, W.G., Wicks, E.M. and Koelling, C.P., 2020. *Engineering Economy*. 17th ed. Boston: Pearson.
Supportive References	Park, C.S., 2023. *Contemporary Engineering Economics*. 7th ed. Boston: Pearson.
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)
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**