



## 54-Course Specification of Engineering Economics

I. Course Identification and General Information:						
1	Course Title:	<i>Engineering Economics</i>				
2	Course Code & Number:	CE410				
3	Credit hours:	C.H				Credit Hours
		Th.	Tu.	Pr.	Tr.	
		2				2
4	Study level/ semester at which this course is offered:	5th Level/ 2 <sup>nd</sup> semester				
5	Pre –requisite (if any):					
6	Co –requisite (if any):	-----				
8	Program (s) in which the course is offered:	Civil Engineering				
9	Language of teaching the course:	English+ Arabic				
10	Location of teaching the course:	Class room				
11	Prepared By:	Dr. Abdslam M Althawr				
12	Date of Approval					

II. Course Description:	
<p>This course is designed to provide students with information about the engineering economy and its application in the civil engineering aspects. <b>It is aimed to introduce them</b> to the basics of engineering economy: aim , economic study's stages, time value money, interest simple and compound, equivalency. <b>They are expected to learn</b> cash flow diagram, different payments' types: present, future, single, annual, salvage, geometric payments, economic tables. <b>They will make alternative</b> analysis, present method, B/C method, <b>and</b> ROR method.</p>	

Prepared by Head of Department  
Dr. Abdulkareem  
Yahya Al khattabi

Quality Assurance Unit  
Ass. Prof. Dr. Mohammad  
Algorafi

Dean of the Faculty  
Prof. Dr. Mohammed  
AL-Bukhaiti

Academic Development  
Center & Quality Assurance  
Ass. Prof. Dr.  
Huda Al-Emad

Rector of Sana'a University  
Prof. Dr. Al-Qassim Mohammed Abbas



III. Course Intended learning outcomes (CILOs) of the course		Referenced PILOs
a1	Define the basics of engineering economy study	A1
a2	Define how to select the appropriate standards and codes of economic analysis	A2
a.3	Define appropriate models to analyze the alternatives	A3
b1	Demonstrate in solving the alternatives to get the best alternative	B1
b2	choose appropriate models to analyze the alternatives	B3
b3	Demonstrate proficiency in the evaluation in civil engineering project related to economic analysis	B4
c1	Create the feasibility study, alternatives option.	C4
d.1	Write report on feasibility study	D1

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1- Define the basics of engineering economy study.	-Lectures, Multimedia . - Demonstration & Discussions	-Mid Term and Final Exam - assignment
a2- Define how to select the appropriate standards and codes of economic analysis	-Lectures, Multimedia . - Demonstration & Discussions	-Mid Term and Final Exam . - assignment
a.3 Define appropriate models to analyze the alternatives	-Lectures, Multimedia . - Demonstration & Discussions	-Mid Term and Final Exam . - assignment

Prepared by Head of Department  
Dr. Abdulkareem  
Yahya Al khattabi

Quality Assurance Unit  
Ass. Prof. Dr. Mohammad  
Algorafi

Dean of the Faculty  
Prof. Dr. Mohammed  
AL-Bukhaiti

Academic Development  
Center & Quality Assurance  
Ass. Prof. Dr.  
Huda Al-Emad

Rector of Sana'a University  
Prof. Dr. Al-Qassim Mohammed Abbas



<b>(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>b1-</b> Demonstrate in solving the alternatives to get the best alternative	-Lectures, Multimedia . - model demonstration -Project method/cases study	- Assignment. - presentation. Project Mid Term and Final Exam
<b>b2-</b> Choose appropriate models to analyze the alternatives	-Lectures, Multimedia . - Practical Application: cases study	- Assignment. -portfolios. project
<b>b3-</b> Demonstrate proficiency in the evaluation in civil engineering project related to economic analysis	- Lectures, Multimedia . - Practical Application	Assignment. -portfolios. project

<b>© Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>c.1</b> Create the feasibility study, alternatives option.	-Lectures, Multimedia -Model demonstration - cases study	- Assignment - Report - Presentation . Mid Term and Final Exam

<b>(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:</b>		
Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
<b>d.1</b> Write report on feasibility study	cases study	- Report

Prepared by Head of Department  
Dr. Abdulkareem  
Yahya Al khattabi

Quality Assurance Unit  
Ass. Prof. Dr. Mohammad  
Algorafi

Dean of the Faculty  
Prof. Dr. Mohammed  
AL-Bukhaiti

Academic Development  
Center & Quality Assurance  
Ass. Prof. Dr.  
Huda Al-Emad

Rector of Sana'a University  
Prof. Dr. Al-Qassim Mohammed Abbas



IV. Course Content:					
A – Theoretical Aspect:					
Order	Units/Topics List	Learning Outcomes	Sub Topics List	Number of Weeks	contact hours
1	Introduction to basics of definition of engineering economy aspects,	a1,a2,b1,b2 ,b3,c1	Economic study process, time value money, interest rates: simple and compound	1	2
2	<b>Equivalency</b>	a1,a2,a3,b1, b2,b3,c1	Cash flow diagram, present and future values, single, annual payments, salvage value	3	6
3	Alternatives analysis	a1,a2,a3,b1, b2,b3,c1	Comparison criteria, present / annual value method, B/C method, ROR method	3	6
4	Alternatives analysis	a1,a2,a3,b1, b2,b3,c1	Comparison criteria, present / annual value method, B/C method, ROR method	2	4
5	Cases studies	a1,a2,a3,b1, b2,b3,c1,d1	Cases studies	4	8
6	Updates and <b>Soft wares</b>	b1,b2,b3,c1	Red analysis, HDM4	1	2
<b>Number of Weeks /and Units Per Semester</b>				<b>14</b>	<b>28</b>

Prepared by Head of Department  
Dr. Abdulkareem  
Yahya Al khattabi

Quality Assurance Unit  
Ass. Prof. Dr. Mohammad  
Algorafi

Dean of the Faculty  
Prof. Dr. Mohammed  
AL-Bukhaiti

Academic Development  
Center & Quality Assurance  
Ass. Prof. Dr.  
Huda Al-Emad

Rector of Sana'a University  
Prof. Dr. Al-Qassim Mohammed Abbas



<b>V. Teaching strategies of the course:</b>
Lecture Multimedia Presentations Discussion Demonstration model demonstration Project method/cases study

<b>VI. Assignments:</b>				
No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Introduction to basics of definition of engineering economy aspects,	a1,a2,a3,b1,b2,b3,c1	2	2
2	<b>Equivalency</b>	a1,a2,a3,b1,b2,b3,c1	4	2
3	Alternatives analysis	a1,a2,a3,b1,b2,b3,c1	6,9	4
4	Cases studies	,b1,b2,b3,c1	11	2

<b>VII. Schedule of Assessment Tasks for Students During the Semester:</b>					
No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Assignments	2,4,6,9,11	10	10%	a1,a2,a3,b1,b2,b3,c1
2	Mid Term	7	10	10%	a1,a2,a3,b1,b2,c1
3	Group project	13	10	10%	b1,b2,b3,c1,d1
4	Final Exam	Schedules	70	70%	a1,a2,a3,b1,b2,c1
<b>Total</b>			<b>100</b>	<b>100%</b>	

Prepared by Head of Department  
Dr. Abdulkareem  
Yahya Al khattabi

Quality Assurance Unit  
Ass. Prof. Dr. Mohammad  
Algorafi

Dean of the Faculty  
Prof. Dr. Mohammed  
AL-Bukhaiti

Academic Development  
Center & Quality Assurance  
Ass. Prof. Dr.  
Huda Al-Emad

Rector of Sana'a University  
Prof. Dr. Al-Qassim Mohammed Abbas



<b>VIII. Learning Resources:</b>	
<ul style="list-style-type: none"> <li>Written in the following order: ( Author - Year of publication – Title – Edition – Place of publication – Publisher).</li> </ul>	
<b>1- Required Textbook(s) ( maximum two ).</b>	
	1- الاقتصاد الهندسي، د جمال اصبيحات العبادي 2011 مكتبة المجتمع العربي للنشر والتوزيع
<b>2- Essential References.</b>	
	1- ملحقات وعروض توزع في المحاضرات تخدم الجزء التطبيقي والحديث في المادة
<b>3- Electronic Materials and Web Sites etc.</b>	
	1- Ms Excell 2- Red analysis 3- HDM4

Prepared by Head of Department  
Dr. Abdulkareem  
Yahya Al khattabi

Quality Assurance Unit  
Ass. Prof. Dr. Mohammad  
Algorafi

Dean of the Faculty  
Prof. Dr. Mohammed  
AL-Bukhaiti

Academic Development  
Center & Quality Assurance  
Ass. Prof. Dr.  
Huda Al-Emad

Rector of Sana'a University  
Prof. Dr. Al-Qassim Mohammed Abbas



<b>IX. Course Policies:</b>	
<b>1</b>	<b>Class Attendance:</b> The students should have more than 75 % of attendance according to rules and regulations of the faculty.
<b>2</b>	<b>Tardy:</b> The students should respect the timing of attending the lectures. They should attend within 1 minutes from starting of the lecture.
<b>3</b>	<b>Exam Attendance/Punctuality:</b> The student should attend the exam on time. The punctuality should be implemented according to rules and regulations of the faculty for midterm exam and final exam.
<b>4</b>	<b>Assignments &amp; Projects:</b> The assignment is given to the students after each chapter, the student has to submit all the assignments for checking on time.
<b>5</b>	<b>Cheating:</b> If any cheating occurred during the examination, the student is not allowed to continue and he/she has to face the examination committee for <b>enquiries</b> .
<b>6</b>	<b>Plagiarism:</b> The student will be terminated from the Faculty, if one student attends the exam on another behalf according to the policy, rules and regulations of the university.
<b>7</b>	<b>Other policies:</b> _ All the teaching materials should be kept out the examination hall.  _ the mobile phone is not allowed.  _ There should be a respect between the student and his teacher.

<b>Reviewed By</b>	<b><u>Vice Dean for Academic Affairs and Post Graduate Studies</u></b> <b><u>Dr. Tarek A. Barakat</u></b> <b><u>Dr. Mohammad Algorafi</u></b>
	<b><u>Deputy Rector for Academic Affairs Dr. Ibrahim AlMutaa</u></b> <b><u>Dr. Ahmed mujahed</u></b> <b><u>Dr. Munaser Alsubri</u></b>

Prepared by Head of Department  
Dr. Abdulkareem  
Yahya Al khattabi

Quality Assurance Unit  
Ass. Prof. Dr. Mohammad  
Algorafi

Dean of the Faculty  
Prof. Dr. Mohammed  
AL-Bukhaiti

Academic Development  
Center & Quality Assurance  
Ass. Prof. Dr.  
Huda Al-Emad

Rector of Sana'a University  
Prof. Dr. Al-Qassim Mohammed Abbas



## Course Plan (Syllabus) of Engineering Economics

I. Information about Faculty Member Responsible for the Course:								
Name of Faculty Member	Dr. Abdslam Althawr		Office Hours					
Location & Telephone No.			SAT	SUN	MON	TUE	WED	THU
E-mail						8-2		

II. Course Identification and General Information:						
1-	Course Title:	<i>Engineering Economics</i>				
2-	Course Number & Code:	CE410				
3-	Credit hours:	C.H				Credit Hours
		Th.	Tu.	Pr.	Tr.	
		2				2
4-	Study level/year at which this course is offered:	5th Level/ 2 <sup>nd</sup> semester				
5-	Pre –requisite (if any):					
6-	Co –requisite (if any):	-----				
7-	Program (s) in which the course is offered	Civil <b>Engineering</b>				
8-	Language of teaching the course:	English+ Arabic				
9-	System of Study:	Regular				
10-	Mode of delivery:	Lecture				
11-	Location of teaching the course:	Class				

Prepared by Head of Department  
Dr. Abdulkareem  
Yahya Al khattabi

Quality Assurance Unit  
Ass. Prof. Dr. Mohammad  
Algorafi

Dean of the Faculty  
Prof. Dr. Mohammed  
AL-Bukhaiti

Academic Development  
Center & Quality Assurance  
Ass. Prof. Dr.  
Huda Al-Emad

Rector of Sana'a University  
Prof. Dr. Al-Qassim Mohammed Abbas





### III. Course Description:

This course is designed to provide students with information about the engineering economy and its application in the civil engineering aspects. **It is aimed to introduce them** to the basics of engineering economy: aim, economic study's stages, time value money, interest simple and compound, equivalency. **They are expected to learn** cash flow diagram, different payments' types: present, future, single, annual, salvage, geometric payments, economic tables. **They will make alternative** analysis: present method, B/C method, ROR method.

### IV. Intended learning outcomes (ILOs) of the course:

- Brief summary of the knowledge or skill, the course is intended to develop the student's skills to:

<b>a1</b>	Define the basics of engineering economy study	A1
<b>a2</b>	Define how to select the appropriate standards and codes of economic analysis	A2
<b>a3</b>	Define appropriate models to analyze the alternatives	A3
<b>b1</b>	Demonstrate in solving the alternatives to get the best alternative	B1
<b>b2</b>	<b>Choose</b> appropriate models to analyze the alternatives	B3
<b>b3</b>	Demonstrate proficiency in the evaluation in civil engineering project related to economic analysis	B4
<b>c1</b>	<b>Create</b> the feasibility study, alternatives option.	C4
<b>d1</b>	Write report on feasibility study	D1

Prepared by Head of Department  
Dr. Abdulkareem  
Yahya Al khattabi

Quality Assurance Unit  
Ass. Prof. Dr. Mohammad  
Algorafi

Dean of the Faculty  
Prof. Dr. Mohammed  
AL-Bukhaiti

Academic Development  
Center & Quality Assurance  
Ass. Prof. Dr.  
Huda Al-Emad

Rector of Sana'a University  
Prof. Dr. Al-Qassim Mohammed Abbas



<b>V. Course Content:</b>				
<ul style="list-style-type: none"> <li>Distribution of Semester Weekly Plan of Course Topics/Items and Activities.</li> </ul>				
<b>A – Theoretical Aspect:</b>				
Order	Topics List	Sub Topics List	Week Due	Contact Hours
1	Introduction to basics of definition of engineering economy aspects,	Economic study process, time value money, interest rates: simple and compound	1	2
2	<b>Equivalency</b>	Cash flow diagram, present and future values, single, annual payments, salvage value	2,3,4	6
3	Alternatives analysis	Comparison criteria, present / annual value method, B/C method, ROR method	5,6,7	6
4	Midterm Exam		8	2
3	Alternatives analysis	Comparison criteria, present / annual value method, B/C method, ROR method	9,10	4
4	Cases studies	Cases studies	11,12,13,14	8
5	Updates and <b>software</b>	Red analysis, HDM4	15	2
8	Final Exam		16	2
<b>Number of Weeks /and Units Per Semester</b>			16	32

Prepared by Head of Department  
Dr. Abdulkareem  
Yahya Al khattabi

Quality Assurance Unit  
Ass. Prof. Dr. Mohammad  
Algorafi

Dean of the Faculty  
Prof. Dr. Mohammed  
AL-Bukhaiti

Academic Development  
Center & Quality Assurance  
Ass. Prof. Dr.  
Huda Al-Emad

Rector of Sana'a University  
Prof. Dr. Al-Qassim Mohammed Abbas



### VI. Teaching strategies of the course:

Lecture  
Multimedia Presentations  
Discussion  
Demonstration  
model demonstration  
-Project method/cases study

### VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Introduction to basics of definition of engineering economy aspects,	a1,a2,a3,b1,b2,b3,c1	3	2
2	Equivalency	a1,a2,a3,b1,b2,b3,c1	4	2
3	Alternatives analysis	a1,a2,a3,b1,b2,b3,c1	6,9	4
4	Cases studies	,b1,b2,b3,c1	11	2

### VIII. Schedule of Assessment Tasks for Students During the Semester:

Assessment	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Assignments	3,6,9,11	10	10%
2	Mid Term	7	10	10%
3	Group project	13	10	10%
4	Final Exam	Schedules	70	70%
5	<b>Total</b>		<b>100</b>	<b>100%</b>

Prepared by Head of Department  
Dr. Abdulkareem  
Yahya Al khattabi

Quality Assurance Unit  
Ass. Prof. Dr. Mohammad  
Algorafi

Dean of the Faculty  
Prof. Dr. Mohammed  
AL-Bukhaiti

Academic Development  
Center & Quality Assurance  
Ass. Prof. Dr.  
Huda Al-Emad

Rector of Sana'a University  
Prof. Dr. Al-Qassim Mohammed Abbas



## IX. Learning Resources:

• Written in the following order: ( Author – Year of publication – Title – Edition – Place of publication – Publisher).

### 1- Required Textbook(s) ( maximum two ).

1- الاقتصاد الهندسي، د جمال اصبيحات العبادي 2011 مكتبة المجتمع العربي للنشر والتوزيع

### 2- Essential References.

1- ملحقات وعروض توزع في المحاضرات تخدم الجزء التطبيقي والحديث في المادة

### 3- Electronic Materials and Web Sites etc.

- 1- Ms Excell
- 2- Red analysis
- 1- HDM4

Prepared by Head of Department  
Dr. Abdulkareem  
Yahya Al khattabi

Quality Assurance Unit  
Ass. Prof. Dr. Mohammad  
Algorafi

Dean of the Faculty  
Prof. Dr. Mohammed  
AL-Bukhaiti

Academic Development  
Center & Quality Assurance  
Ass. Prof. Dr.  
Huda Al-Emad

Rector of Sana'a University  
Prof. Dr. Al-Qassim Mohammed Abbas



X. Course Policies:	
1	<p><b>Class Attendance:</b></p> <p>The students should have more than 75 % of attendance according to rules and regulations of the faculty.</p>
2	<p><b>Tardy:</b></p> <p>The students should respect the timing of attending the lectures. They should attend within 1 minutes from starting of the lecture.</p>
3	<p><b>Exam Attendance/Punctuality:</b></p> <p>The student should attend the exam on time. The punctuality should be implemented according to rules and regulations of the faculty for midterm exam and final exam.</p>
4	<p><b>Assignments &amp; Projects:</b></p> <p>The assignment is given to the students after each chapter, the student has to submit all the assignments for checking on time.</p>
5	<p><b>Cheating:</b></p> <p>If any cheating occurred during the examination, the student is not allowed to continue and he/she has to face the examination committee for <b>enquiries</b>.</p>
6	<p><b>Plagiarism:</b></p> <p>The student will be terminated from the Faculty, if one student attends the exam on another behalf according to the policy, rules and regulations of the university.</p>
7	<p><b>Other policies:</b></p> <ul style="list-style-type: none"> <li>_ All the teaching materials should be kept out the examination hall.</li> <li>_ the mobile phone is not allowed.</li> <li>_ There should be a respect between the student and his teacher.</li> </ul>

Prepared by Head of Department  
Dr. Abdulkareem  
Yahya Al khattabi

Quality Assurance Unit  
Ass. Prof. Dr. Mohammad  
Algorafi

Dean of the Faculty  
Prof. Dr. Mohammed  
AL-Bukhaiti

Academic Development  
Center & Quality Assurance  
Ass. Prof. Dr.  
Huda Al-Emad

Rector of Sana'a University  
Prof. Dr. Al-Qassim Mohammed Abbas