



Course Syllabus (Academic Year 2020)

School of Interdisciplinary Studies, Kanchanaburi Campus, Mahidol University

1. **Course No. and Title** : KAED 378 Engineering Economics
Credit (study hours) : 3(3-0-6)
2. **Program Name** : Bachelor of Engineering Program in Environmental Engineering and Disaster management
3. **Course Module** : Specific Elective Courses
4. **Pre/co-requisite** : none
5. **Class Semester** : 1st Semester 2nd Semester Academic Year 2020
6. **Class Schedule & Venue** : Thursday, 13:00 – 16:00
7. **Class Coordinator** : Dr.Keerati Sripramai
 Contact No. : 081-685-0002 Email : keerati.sri@mahidol.edu

8. Course Description

A systematic evaluation on costs and benefits of engineering projects in consideration of “Time Value of Money” concept; discounted cash flow schematics diagram; and decision making on the project regarding to financial parameters; and applications in the engineering projects.

9. Course Objectives / Course Learning Outcomes (CLOs)

No.	Objectives / CLOs	Expected Skills / Knowledge			PLOs	ABET Criteria
		Specific	Generic	Knowledge		
8.1	To students can describe A systematic evaluation on costs and benefits of engineering projects in consideration of “ Time Value of Money” concept.	SS10,SS11	GS1,GS2,GS8	K1-K5	1	(a), (b), (c), (e)
8.2	To students can analyze the discounted cash flow schematics diagram; and decision making on the project regarding to financial parameters; and applications in the engineering projects.	SS10,SS11	GS1,GS2,GS8	K1-K5	1	(a), (b), (c), (e)

10. Class Instructor List

Dr.Keerati Sripramai

Contact No. : 08 1685 0002 Email : keerati.sri@mahidol.edu

Dr.Wimonmas Boonyungyuen

Contact No. :08 1906 6678 Email : wimonmas.boo@mahidol.edu

11. Course Outline

Week	Date	Contents	CLOs	Teaching & Learning method	Instructor's Names
1	13 Aug 20	Concept of Engineering Economics	8.1,8.2	<ul style="list-style-type: none"> ● Presentation ● Assignment 	Keerati, Wimonmas
2	20 Aug 20	Cash-Flow Diagrams	8.1,8.2	<ul style="list-style-type: none"> ● Presentation ● Assignment 	Keerati, Wimonmas
3	27 Aug 20	Factors	8.1,8.2	<ul style="list-style-type: none"> ● Presentation ● Assignment 	Keerati, Wimonmas
4	3 Sep 20	Nominal and Effective Interest Rates	8.1,8.2	<ul style="list-style-type: none"> ● Presentation ● Assignment 	Keerati, Wimonmas
5	10 Sep 20	Present-Worth	8.1,8.2	<ul style="list-style-type: none"> ● Presentation ● Assignment 	Keerati, Wimonmas
6	17 Sep 20	Rate-of-Return Computations for a Single Project	8.1,8.2	<ul style="list-style-type: none"> ● Presentation ● Assignment 	Keerati, Wimonmas
7	24 Sep 20	Rate-of-Return Evaluation for Multiple Alternatives	8.1,8.2	<ul style="list-style-type: none"> ● Presentation ● Assignment ● Quiz 	Keerati, Wimonmas
8	1 Oct 20	Benefit/Cost Ratio Evaluation	8.1,8.2	<ul style="list-style-type: none"> ● Presentation ● Assignment 	Keerati, Wimonmas
9	Mid-term Examination 8 Oct 20				
10	15 Oct 20	Replacement Analysis	8.1,8.2	<ul style="list-style-type: none"> ● Presentation ● Assignment 	Keerati, Wimonmas
11	22 Oct 20	Capital Recovery and Depletion Models	8.1,8.2	<ul style="list-style-type: none"> ● Presentation ● Assignment 	Keerati, Wimonmas

12	29 Oct 20	Taxation	8.1,8.2	<ul style="list-style-type: none"> ● Presentation ● Assignment 	Keerati, Wimonmas
13	5 Nov 20	Breakeven Values	8.1,8.2	<ul style="list-style-type: none"> ● Presentation ● Assignment 	Keerati, Wimonmas
14	12 Nov 20	Cost Capital	8.1,8.2	<ul style="list-style-type: none"> ● Presentation ● Assignment 	Keerati, Wimonmas
15	19 Nov 20	Sensitivity Analysis and Decision Trees	8.1,8.2	<ul style="list-style-type: none"> ● Presentation ● Assignment ● Quiz 	Keerati, Wimonmas
16	26 Nov 20	Decision Making for Large Capital Investments.	8.1,8.2	<ul style="list-style-type: none"> ● Presentation ● Group assignment presentation 	Keerati, Wimonmas
17	Final Examination 3 Dec 20				
18					

12. Course Assessment

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
11.1	Mid-term exam	<ul style="list-style-type: none"> ■ Content (Week 1-8) ■ Open-book Examination ■ Faculty-approved calculator ■ 3 Hours 	8.1,8.2	9	30
11.2	Final exam	<ul style="list-style-type: none"> ■ Content (Week 10-16) ■ Open-book Examination ■ Faculty-approved calculator ■ 3 Hours 	8.1,8.2	17	30
11.3	Assignments / Quiz	<ul style="list-style-type: none"> ■ 1 group assignment ■ 14 assignments ■ 2 quizzes 	8.1,8.2	16 1-8,10-16 7,15	15 15 5
11.4	Class participation	Sign name and student must attend a class more than 80%	8.1,8.2	1-8,10-16	5

		of the whole course			
				Total	100

13. Grading System

Criterion-referenced evaluation

Grade	Score	Grade	Score	Grade	Score	Grade	Score
A	≥ 80 %	B	70 – 74.99%	C	60 – 64.99%	D	50 – 54.99%
B+	75 – 79.99%	C+	65 – 69.99%	D+	55 – 59.99%	F	< 50 %

14. References

14.1 เศรษฐศาสตร์วิศวกรรม: Engineering Economy. กรุงเทพฯ : สำนักพิมพ์ท็อป, 2549. 364 หน้า.

14.2 Leland T. Blank, Anthony J. Tarquin., et al. (2012). Engineering economy: (7th ed.): McGraw-Hill.

14 Note:

Specific Skill (SS)	
SS10	To understand principle functions, advantages and disadvantages of each IT tool
SS11	To apply and select suitable IT tool for each scenario/situation
Generic Skill (GS)	
GS1	Systematic Thinking, Problem Solving and Analytical Skills
GS2	Basic Computer Skills
GS3	Environmental and Disaster Risk Awareness
GS5	An ability to function on multidisciplinary teams
GS8	An ability to use the techniques, skills and modern engineering tools necessary for engineering practice
Knowledge (K)	
K1	Cash-Flow Diagrams
K2	Interest rate
K3	Worth/Benefit/cost/rate of return analysis
K4	Sensitivity analysis and value decisions
K5	Engineering economy
ABET Criteria	
(a)	An ability to apply knowledge of mathematics, science, and engineering
(b)	An ability to design and conduct experiments, as well as to analyze and interpret data
(c)	An ability to design a system, component, or process to meet desired needs within and safety, manufacturability, and sustainability reality constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(e)	An ability to identify, formulate, and solve engineering problems

