ÇANKAYA UNIVERSITY
Faculty of Engineering
Course Definition Form

Part I. Basic Course Information

Department Name	INDUSTRIAL ENGINEERING					**Dept. Numeric Code**	12
Course Code	IE345	**Number of Weekly Lecture Hours**	3	**Number of Weekly Lab/Tutorial Hours**	0	**Number of Credit Hours**	3
Course Web Site	http://ie345.cankaya.edu.tr					**ECTS Credit**	04

Course Name *This information will appear in the printed catalogs and on the web online catalog.*	
English Name	ENGINEERING ECONOMY
Turkish Name	MÜHENDİSLİK EKONOMİSİ

Course Description
Provide a brief overview of what is covered during the semester. This information will appear in the printed catalogs and on the web online catalog. Maximum 60 words.

This course highlights the importance of economic principles in engineering applications, especially in project evaluation procedures. Basics of economic evaluation of engineering decisions such as time value of money, inflation, depreciation and income taxes and related techniques are given.

Prerequisites (if any) *Give course codes and check all that are applicable.*	1st	2nd	3rd	4th
	☐ Consent of the Instructor	☐ Senior Standing	☐ Give others, if any.	
Co-requisites (if any)	1st	2nd	3rd	4th
Course Type *Check all that are applicable*	☐ Must course for dept.	☒ Must course for other dept.(s)	☐ Elective course for dept.	☐ Elective course for other dept.(s)

Course Classification
Give the appropriate percentages for each category.

Category	Mathematics & Natural Sciences	Engineering Sciences	Engineering Design	General Education	Other
Percentage	40	40	20		

Part II. Detailed Course Information

Course Objectives
Explain the aims of the course. Maximum 100 words.

The main aim of this course is:

- To give students the ability to analyze the engineering problems using an economic view,
- To give students the ability to evaluate different engineering projects and select the best one(s) among them using various evaluation methods,
- To develop skills for using economic concepts in engineering applications.

Learning Outcomes
Explain the learning outcomes of the course. Maximum 10 items.

On successful completion of this course, all students will have developed:

1. Knowledge of the effects of time, money, interest rate and inflation on value of money and economic equivalence,
2. Ability to identify private/public sector projects, mutually exclusive/independent projects, and to formulate engineering economic problems and make present/annual/future worth, rate of return and benefit/cost analysis,
3. Skills in analyzing and comparing project alternatives using different analytical, numerical and incremental evaluation methods,
4. Capability to determine the economic lives of alternatives and make replacement analysis,
5. Understand basics of breakeven analysis, depreciation methods, and taxation,
6. Skills in report writing.

On successful completion of the course, all students will have:

7. Improved their team work skills,
8. Awareness of ethical issues.

Textbook(s)
List the textbook(s), if any, and other related main course materials.

Author(s)	Title	Publisher	Publication Year	ISBN
Leland Blank Anthony Tarquin	Engineering Economy, 7th Ed.	McGraw-Hill	2012	978-007-108609-7

Reference Books
List the reference books as supplementary materials, if any.

Author(s)	Title	Publisher	Publication Year	ISBN
William G. Sullivan, Elin M. Wicks, and C. Patrick Koelling	Engineering Economy, 16th ed.	Prentice Hall	2014	978-0133439274
Donald G. Newnan, Jerome P. Lavelle, and Ted G. Eschenbach	Engineering Economic Analysis, 12th ed.	Oxford University Press	2013	978-0199339273
Chan S. Park	Contemporary Engineering Economics	Pearson, 5 ed.	2011	0-13-509638-3
John A. White Kenneth E. Case David B. Pratt	Principles of Engineering Economic Analysis	Wiley	2010	978-0-470-11396-7
William G. Sullivan Elin M. Wicks James T. Luxhoj	Engineering Economy	Prentice Hall	2006	0-13-148649-7

Teaching Policy
Explain how you will organize the course (lectures, laboratories, tutorials, studio work, seminars, etc.)

3 hours of lecturing per week.

Laboratory/Studio Work
Give the number of laboratory/studio hours required per week, if any, to do supervised laboratory/studio work, and list the names of the laboratories/studios in which these sessions will be conducted.

No Laboratory/Studio Work.

Computer Usage
Briefly describe the computer usage and the hardware/software requirements in the course.

Spreadsheet programming will be used in solving problems.

Course Outline
List the topics covered within each week.

Week	Topic(s)
1	Foundations of Engineering Economy, Time Value of Money and Economic Equivalence
2	Engineering Economy Factors: How Time and Interest Affect Money
3	Combining Engineering Economy Factors
4	Nominal and Effective Interest Rates
5	Methods for Project Evaluation and Selection: Present Worth Analysis
6	Methods for Project Evaluation and Selection: Annual Worth Analysis
7	Rate of Return Analysis: Single Project

8	Rate of Return Analysis: Multiple Alternatives
9	Rate of Return Analysis: Multiple Alternatives (continued)
10	Public Sector Projects and Benefit/Cost Analysis
11	Breakeven and Payback Analysis
12	Replacement and Retention Decisions
13	Cost Concepts and Basics of Cost Analysis, Depreciation Methods and After-Tax Economic Analysis
14	Effects of Inflation

Grading Policy
List the assessment tools and their percentages that may give an idea about their relative importance to the end-of-semester grade.

Assessment Tool	Quantity	Percentage	Assessment Tool	Quantity	Percentage	Assessment Tool	Quantity	Percentage
Homework	3	20	Case Study	1	15	Attendance		
Quiz			Lab Work			Field Study		
Midterm Exam	1	30	Class Participation			Project		
Term Paper			Oral Presentation			Final Exam	1	35

ECTS Workload
List all the activities considered under the ECTS.

Activity	Quantity	Duration (hours)	Total Workload (hours)
Attending Lectures (*weekly basis*)	14	3	42
Attending Labs/Recitations (*weekly basis*)			0
Preparation beforehand and finalizing of notes (*weekly basis*)			0
Collection and selection of relevant material (*once*)			0
Self study of relevant material (*weekly basis*)			0
Homework assignments	3	5	15
Preparation for Quizzes			0
Preparation for Midterm Exams (*including the duration of the exams*)	1	15	15
Preparation of Term Paper/Case Study Report (*including oral presentation*)	1	10	10
Preparation of Term Project/Field Study Report (*including oral presentation*)			0
Preparation for Final Exam (*including the duration of the exam*)	1	20	20
TOTAL WORKLOAD / 25			4,08
ECTS Credit			**4**

Total Workloads are calculated automatically by formulas. To update all the formulas in the document first press CTRL+A and then press F9.

Program Qualifications vs. Learning Outcomes
Consider the below program qualifications determined in terms of learning outcomes of all the courses in the curriculum and capabilities. Look at the learning outcomes of this course given above. Relate these two using the Likert Scale by marking with X in one of the five choices at the right.

No	Program Qualifications	Contribution				
		0	1	2	3	4
1	Adequate knowledge in mathematics, science, engineering and social sciences subjects pertaining to Industrial Engineering; ability to use theoretical and applied information in these areas in complex Industrial Engineering problems.					
2	Ability to identify, define, formulate and solve complex Industrial Engineering problems involving human, material, machinery, money, information, time and energy elements; ability to select and apply proper analysis tools, operations research methods and modeling techniques for formulating and solving such problems.					
3	Ability to analyze a complex system and/or a subsystem or a process involving human, material, machinery, money, information, time and energy elements and ability to design it under realistic constraints and conditions, in such a way as to meet the desired improvement; ability to apply modern systems design methods for this purpose.					
4	Ability to devise, select, and use modern techniques and computing tools needed for analyzing and solving complex problems encountered in Industrial Engineering practice; ability to use information technologies effectively with the knowledge of state-of-the art hardware, and especially software capabilities related to Industrial Engineering.					

5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex Industrial Engineering problems or Industrial Engineering research questions.					
6	Ability to work efficiently in intra-disciplinary and multidisciplinary teams by collaborating effectively; ability to work individually.					
7	Ability to communicate effectively in Turkish and in English, both orally and in writing; ability to use visual tools such as technical drawing and flow diagram; ability to write effective reports and comprehend written reports, prepare design and production reports, make effective presentations, and give and receive clear and intelligible instructions.					
8	Awareness of the need for lifelong learning; ability to access information (ability to search resources, to use databases and other information sources to access information), to follow developments in science and technology, and to keep continuous self-improvement.					
9	Consciousness to behave according to ethical principles and professional and ethical responsibility; knowledge on standards used in engineering practice.					
10	Knowledge about business life practices such as project management, risk management, and change management; awareness in entrepreneurship, innovation; knowledge about sustainable development.					
11	Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering; awareness of the legal consequences of engineering solutions.					

Contribution Scale to a Qualification: **0**-None, **1**-Little, **2**-Medium, **3**-Considerable, **4**-Largest

Part III New Course Proposal Information

State only if it is a new course

Is the new course **replacing** a former course in the curriculum**?**	Yes ☐	No ☐	Former Course's Code	Former Course's Name
Is there any similar course which has content **overlap** with other courses offered by the university**?**	Yes ☐	No ☐	Most Similar Course's Code	Most Similar Course's Name
Frequency of Offerings *Check all semesters that the course is planned to be offered.*	☐ Fall	☐ Spring	☐ Summer	
First Offering	Academic Year		Semester ☐ Fall	☐ Spring
Maximum **Class Size** Proposed		Student **Quota** for Other Departments		Approximate **Number of Students** Expected to Take the Course
Justification for the proposal *Maximum 80 words*				

Part IV Approval

	Faculty Member *Give the Academic Title first.*	Signature	Date
Proposed by	Asst. Prof. Dr. Nureddin KIRKAVAK		05.02.2017
	Asst. Prof. Dr. Haluk AYGÜNEŞ		05.02.2017

Departmental Board Meeting Date		Meeting Number		Decision Number	
Department Chair	Assoc. Prof. Dr. Ferda Can ÇETİNKAYA	Signature		Date	

Faculty Academic Board Meeting Date		Meeting Number		Decision Number	
Dean	Prof. Dr. H. Selçuk GEÇİM	Signature		Date	

Senate Meeting Date		Meeting Number		Decision Number	