

COURSE INFORMATION					
Course Title	<i>Code</i>	<i>Semester</i>	<i>L+P+L Hour</i>	<i>Credits</i>	<i>ECTS</i>
Engineering Management	ES 301	5/7 Fall	3 + 0 + 0	3	4

Prerequisites	-
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Language of Instruction	English
Course Level	Bachelor's Degree
Course Type	Restricted Elective
Course Coordinator	
Instructors	Öğr. Gör. Cem KUM
Assistants	
Goals	The aim of this course is to furnish students with the necessary knowledge and abilities so that they will be able to make correct and economically viable decisions, and will be able to operate in teams, by introducing them to elements of cost accounting, finance, as well as elements of team-work, and several mathematical models that will be beneficial to them in making managerial decisions.
Content	<ul style="list-style-type: none"> • Fundamentals of cost accounting; concepts, and measurement • Concept of financial risk and return & mathematical models of measuring risk and return; • Linear programming; slacks, sensitivity analysis; • Network analysis; PERT & CPM; • Stock inventory models; EOQ, EPLS, Shortages; • Principles of team workteam-work.

Learning Outcomes	Programme Learning Outcomes	Teaching Methods	Assessment Methods
1) Using mathematical scenarios to comprehend the important contribution of cost accounting, and to obtain optimal solutions therefrom in the solution of engineering and management problems	1,2,9,10,11	1,2,4	A,C
2) To grasp the major effects of financial risk and return in engineering and management problems, and to make optimal choices between various financial projects.	1,2,9,10,11	1,2,4	A,C
3) To devise and develop optimal solutions to engineering and management problems by the efficient utilization of mathematical models.	1,2	1,2,4	A,C
4) To understand the nature and implementation of team-work	6	1,2,4	A

Teaching Methods:	1: Lecture, 2: Question-Answer, 3: Lab, 4: Case Study
Assessment Methods:	A: Testing B: Experiment, C: Homework, D: Project

COURSE CONTENT		
Week	Topics	Study Materials
1	Definition of management, and management cycle, planning & control functions, budgets, importance of reporting in exercising the control function, types of reports, classification of costs	Lec. Notes Ref. 1
2	Classification of organisations from the perspective of cost accounting, concepts of raw-material, work -in-progress, and finished-goods stocks, balance sheets and income statements, case studies	Lec. Notes Ref. 1
3	Cost-Volume-Profit relationships, solutions, and applications by the use of algebraic, graphical and unit contribution margin techniques	Lec. Notes Ref. 1
4	Definitions and uses of main capital, and operational capital; case studies; definition and examples of opportunity costs	Lec. Notes Ref. 1
5	Concept of depreciation, and applications, production planning; case studies	Lec. Notes Ref. 1
6	Joint production costs, case study	Lec. Notes Ref. 1
7	Concepts and calculation methods of financial uncertainty, risk and return, probability distributions, definition of life cycle of a project, concept of cash-flow, and how it differs from the concept of profit, and the contribution of depreciation costs to cash flow after tax.	Lec. Notes Ref. 2
8	Risk and Return calculations for investment projects, average rate of return, payback period, and "Net Present Value" calculation techniques (NPV, PI, IRR), concept of total risk and methods of diversification	Lec. Notes Ref. 2
MIDTERM EXAM 1		
9	Network analysis techniques, the importance of critical activities, and of the critical path for the timely completion of a project, analysis of CPM networks, time-cost trade-offs	Lec. Notes Ref. 3 & 4
10	Analysis of PERT networks, calculations regarding probability of completion	Lec. Notes Ref. 3 & 4
11	Importance of stocking good, and the cost of stocking to the organisation, calculation of optimal stock levels, deterministic stock models (EOQ, EPLS), and optimisation techniques	Lec. Notes Ref. 3 & 4
12	Development of Stock Model with Shortages, its optimization, case studies, and examples for all models	Lec. Notes Ref. 3 & 4
13	Constraints effecting the decision making process, Linear Programming, problem definition, solution techniques, graphical solution to LP problems, maxima, and minima applications, slacks, and sensitivity analysis	Lec. Notes Ref. 3 & 4
14	Fundamentals of team-work, origins and organisation, communication within the team, and with third parties, team management, and leadership	Lec. Notes

RECOMMENDED SOURCES

Textbook	ES 301 Lecture Notes
Additional Resources	Ref. 1) Cost Accounting: A Managerial Emphasis/ Horngren, Datar, Foster/Prentice-Hall Ref. 2) Managerial Finance/Gitman, Joehnk, Pinches/Harper & Row Publ. Ref. 3) Quantitative Analysis for Management / Render, Stair, Hanna/ Prentice-Hall Ref. 4) Introduction to Management Science/ B.W. Taylor/Prentice-Hall

MATERIAL SHARING
Documents
Assignments
Exams

ASSESSMENT		
IN-TERM STUDIES	NUMBER	PERCENTAGE
Mid-Term	2	50
Assignment		
Lab Work		
Term Project		
	Total	50
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE		50
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		
	Total	100

COURSE CATEGORY	Expertise/Field Courses
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COURSE'S CONTRIBUTION TO PROGRAMME						
No	Program Learning Outcomes	Contribution				
		1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve management problems.			X		
2	Ability to identify, formulate, and solve complex management problems; ability to select and apply proper analysis and modeling methods for this purpose.				X	
3	Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.					
4	Engineering practice; ability to employ information technologies effectively.					

5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating engineering problems.	
6	Ability to work efficiently in intra-disciplinary and multi-disciplinary teams; ability to work individually.	X
7	Ability to communicate effectively both orally and in writing; knowledge of a minimum of one foreign language	
8	Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.	
9	Awareness of professional and ethical responsibility.	
10	Information about business life practices such as project management, risk management, and change management; awareness of entrepreneurship, innovation, and sustainable development.	X
11	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety; awareness of the legal consequences of engineering solutions.	X

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION			
Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration (Including the exam week: 12x Total course hours/week)	14	3	42
Hours for off-the-classroom study (Pre-study, practice)	14	4	56
Midterm examination	2	1	2
Homework			
Project			
Final examination	1	1	1
Total Work Load			101
Total Work Load / 25 (h)			4.04
ECTS Credit of the Course			4