

**DEPARTMENT of INDUSTRIAL ENGINEERING  
COURSE CATALOGUE FORM**



<b>Course Code:</b> INDE4403				<b>Course Title:</b> Engineering Investment Decisions			
<b>Semester</b>	<b>L + R + L</b>	<b>Credits</b>	<b>AKTS</b>	<b>Language</b>	<b>Category</b>	<b>Instructional Methods</b>	<b>Prerequisites</b>
7	3+0+0	3	6	English	Elective	Lecture	INDE2442
<b>Course Objectives</b>				This course is organized with a focus on financial basic concepts and methods required during the feasibility phase. The uncertainty dimension of the analysis is detailed with the risk approach.			
<b>Course Content</b>				Financial statements, Capital and operating costs accounts, Revenue, Tax and operating capital estimates, Criteria for investment decision, Sensitivity and scenario analysis, Risk and capital product pricing, Capital costs, stochastic and risk-based reduction methods, Monte Carlo Simulation			
<b>Course Learning Outcomes</b>				Students, who pass the course satisfactorily: 1. Ability to read and analyze financial statements [2] 2. Basic turnover, operation and equipment cost estimation capability [2] 3. Ability to understand the basic criteria for investment decisions [2] 4. Ability to understand and estimate risk and uncertainty in investment analysis [2] 5. Ability to manage risk at the decision-making stage [2]  [Note: Numbers in brackets are indicating the related program outcomes]			
<b>ISCED Category of the course</b>				52 Engineering			
<b>Textbook</b>				F.K. Crundwell., Finance for Engineers, Springer, 2008			
<b>Supplementary Material</b>				William G. Sullivan, Elin M. Wicks, C. Patrick Koelling., Engineering Economy (15th Edition), Prentice Hall, 2011			

**COURSE PLAN**

Week	Topics	Laboratory / Tutorial Work
1	Overview	
2	Financial Statements	
3	Capital and Operating Costs Estimates	
4	Income, Tax and Working Capital Estimates	
5	Time Value Estimates	
6	Evaluation Criteria for Investment Decisions	
7	Evaluation Criteria for Investment Decisions	
8	Sensitivity and Scenario Analysis	
9	Risk and CAPM	
10	Cost of Capital	
11	Probability and Risk adjusted discount rate	
12	Precision Equivalence Mthd. and Monte Carlo Simulation	
13	Decision tree and utility theory.	
14	Real options analysis	

**COURSE ASSESSMENT SYSTEM**

	Activities	Contribution (%)
<b>Semester Activities</b>	<b>Semester Written Exams</b>	50
	<b>Homework</b>	
	<b>Presentations</b>	
	<b>Term Project</b>	25
	<b>Other (attendance, field trip etc.)</b>	5
<b>FINAL EXAM</b>		25
<b>Total</b>		100

**CONTRIBUTION of the COURSE on INDUSTRIAL ENGINEERING PROGRAM OUTCOMES**

	<b>Program Outcomes</b>	Low	High
1	Adequate knowledge in mathematics, science and subjects pertaining to Industrial Engineering; ability to use theoretical and applied knowledge in these areas in complex engineering problems.		
2	Ability to identify, formulate, and solve complex Industrial Engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.		<b>X</b>
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	Ability to devise, select, and use modern techniques and tools needed for analyzing and solving problems encountered in engineering practice; ability to employ information technologies effectively.		
5	Ability to design and conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or discipline specific research questions.		
6	Ability to work efficiently individually and in intra-disciplinary / multi-disciplinary teams.		
7	Knowledge of Turkish and English languages; ability to communicate effectively orally, inscriptive and visually by using these languages (via business methods such as reports, presentations and instructions).		
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	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 (management activities such as project, risk, change and quality etc.); awareness in entrepreneurship, innovation; knowledge about sustainable development.		
11	Knowledge about the global and social effects of engineering practices on health, environment, economics and safety, and contemporary issues of the century reflected into the field of engineering; awareness of the legal consequences of engineering solutions.		

**ECTS - WORK LOAD TABLE**

<b>COURSE ACTIVITIES</b>	<b>Quantity</b>	<b>Time (hr)</b>	<b>Work Load (hr)</b>
Lectures	14	3	42
Final Exam (Preparation included)	1	20	20
Semester Written Exams (Preparation included)	2	15	30
Out of class study time	14	2	28
Homework			
Reports			
Labs			
Seminar			
Presentations			
Term Project	1	30	30
<b>Total Load (hr)</b>			150
<b>ECTS Credits of the course (Total Work Load / 25)</b>			6

<b>Revision/Date</b> 5/02/2020	<b>Coordinator / Prepared By</b> Kemal Sarıca	<b>Approved By</b> Çağlar Aksezer
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