

**DEPARTMENT of INDUSTRIAL ENGINEERING
COURSE CATALOGUE FORM**



Course Code: INDE3401				Course Title: Risk Analysis			
Semester	L + R + L	Credits	AKTS	Language	Category	Instructional Methods	Prerequisites
6	3 + 0 + 0	3	5	English	Elective	Lecture	MATH2201
Course Objectives				To introduce quantitative risk analysis and control techniques by engineering, economic, environmental and security aspects and to introduce their role in decision support systems.			
Course Content				Basic topics and interactions on different areas of risk; engineering, finance, environment and security. Risk management phases; identifying, evaluating, coordinating and observing the risk as a priority. Multi-objective optimization on the trade-off between risk, cost and security elements. Loss functions and Utility Theory for robust design, control and risk optimization.			
Course Learning Outcomes				Students, who pass the course satisfactorily: 1. Able to make risk analysis and optimization with appropriate numerical methods. [2] 2. Ability to use risk as a decision support tool with different dimensions (security, environment, finance, etc.). [2] [Note: Numbers in brackets are indicating the related program outcomes]			
ISCED Category of the course				52 Engineering			
Textbook				Principles of Risk Analysis: Decision Making Under Uncertainty - Charles Yoe			
Supplementary Material				-			

COURSE PLAN

Week	Topics	Laboratory / Tutorial Work
1	Historical notes and basic concepts	-
2	Review of probabilistic and statistical models	-
3	Review of probabilistic and statistical models	-
4	Decision making under uncertainty	-
5	Risk modeling	-
6	Decision trees	-
7	Loss functions	-
8	Loss functions	-
9	Utility Theory	-
10	Risk in financial engineering	-
11	Safety and reliability	-
12	Environmental and ethical dimension	-
13	Risk management and alternative scenario studies	-
14	Recent advances in risk engineering	-

COURSE ASSESSMENT SYSTEM

	Activities	Contribution (%)
Semester Activities	Semester Written Exams	40
	Homework	-
	Reports	-
	Labs	-
	Seminars	-
	Presentations	-
	Term Project	15
	Other (attendance, field trip etc.)	10
FINAL EXAM		35
Total		100

CONTRIBUTION of the COURSE on INDUSTRIAL ENGINEERING PROGRAM OUTCOMES

	Program Outcomes	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.		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	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

COURSE ACTIVITIES	Quantity	Time (hr)	Work Load (hr)
Lectures	14	3	42
Final Exam (Preparation included)	1	20	20
Semester Written Exams (Preparation included)	2	10	20
Out of class study time	12	2	24
Homework	-	-	-
Reports	-	-	-
Labs	-	-	-
Seminar	-	-	-
Presentations	-	-	-
Term Project	1	20	20
Total Load (hr)			126
ECTS Credits of the course (Total Work Load / 25)			5

Revizyon/Tarih 5/02/2020	Koordinatör / HAZIRLAYAN Çağlar Aksezer	ONAYLAYAN Çağlar Aksezer
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