BOĞAZİÇİ UNIVERSİTY

Department of Civil Engineering

58F: Risk Management and Decision Analysis

SYLLABUS

NOTE: This syllabus is subject to change. Any changes will be communicated in advance.

COURSE: Risk Management and Decision Analysis [3 credits]
Hour: T 8,9,10
Room: M 2231
Office Hour: Tuesday 15:00-16:00

INSTRUCTOR: Semra Çomu, PhD
Email: semra.comu@boun.edu.tr
Phone: +90 212 359 4841
Office: M3000

Course Description (Catalog):
CE 58F Risk Management and Decision Analysis
(3+0+0)3
Introduction to risk management framework. Qualitative and quantitative risk analysis tools and methods. Soft systems methodology, Monte Carlo Simulation, multi-attribute decision making tools, sensitivity testing. Construction industry related case studies. Demonstrating the application of risk management principles and techniques in practice.

Prerequisite: CE 202 Introduction to Probability and Statistics for Civil Engineers.

Course Objectives (Learning Outcomes):
This course is designed to acquaint students with issues relating to the basic principles and applications of risk management and decision analysis. The main objective of this course is to provide students with both theoretical and practical methods for risk analyses and decision-making in relation to construction projects. By the end of the course, students will

- Develop a systematic understating of construction project risks and risk management frameworks.
- Learn risk identification methods.
- Learn both qualitative and quantitative risk analysis tools and methods.
- Develop an understanding on decision analysis and making decisions under uncertainty.
- Analyse case studies taken from construction industry to understand the application of risk management principles and techniques in practice.

Textbook:
- No assigned text book. Lecture notes will be provided.

References:

- Smith, N.J. (1999) Managing risk in construction projects, Blackwell Scientific Publications, Oxford, UK.
- Making Hard Decisions: An Introduction to Decision Analysis, 2nd ed., Robert Clemen, Duxbury Press, 1997
- Flanagan R. and Norman, G. (2000) Risk management and construction, Blackwell Scientific Publications, Oxford, UK.
- Chicken, J. C. (1994) Managing risks and decisions in major projects, Chapman and Hall, London, UK.
- Raftery, J. (1994) Risk analysis in project management, St. Edmundsbury Press Ltd., Suffolk.
- Cooper D.F. and Chapman, C.B. (1986) Risk analysis for large projects, John Wiley and Sons, UK.

Curricular Context

This elective course provides the graduate students with the elementary techniques about risk management and decision analysis of construction projects with the systematic approach as applied to engineering.

Laboratory and Computer Usage: N/A

Honor Policy:

Academic Integrity is expected of all students at all times. Boğaziçi University the Code of Student Rights and Responsibilities applies to all work in this class, including homework and examinations. Suspected violations of the code will be immediately referred to the ethics committee for adjudication. (See the Code of Student Rights and Responsibilities **http://www.boun.edu.tr/Default.aspx?SectionID=703**)

Class Policies:

- Participation: 5% of the course grade.
- Midterm exam: 25% of the course grade.
- Term Project: 25% of the course grade
- Assignments: 15% of the course grade
- Final exam: Comprehensive exam at the end of the semester, 30% of the course grade.

Contribution of the Course to Program Outcomes:

(a) An ability to apply knowledge of mathematics, science and engineering
(e) An ability to identify, formulate and solve engineering problems
(j) A knowledge of contemporary issues
(k) An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

Good Luck and Enjoy the Course!

Week	Topic	Reading Assignment	Content
1	Course Introduction Introduction to Construction Projects and Risk		Going over the syllabus. Introduction to the concept of risk. Construction Projects, Organizational Structures, Project Networks, Project Risks, Project Networks in Risk Management
2	Introduction to the risk management	" Systematic Risk Management Approach for Construction Projects"	Risk and value management. The risk management process and model. Understanding project risks. Applying value and risk management. Risk identification.
3	Risk Analysis - Qualitative Methods	"Management of risks, uncertainties and opportunities on projects: time for a fundamental shift"	Checklists, the risk logs, Using a risk log to formulate risk management strategy, Qualitative methods, Soft systems methodology
4	Risk Analysis - Quantitative Methods	" Using fuzzy risk assessment to rate cost overrun risk in international construction projects"	Probabilistic analysis , sensitivity testing, multi-attribute risk assessment, fuzzy rating
5	Risk Analysis - Modeling and Simulation		Probability, correlation, data processing, Monte Carlo Simulation, computer applications
6	Risk Response Strategies		Risk reduction, transfer, sharing and retaining strategies, risk allocation in contracts
7	Introduction to Decision Analysis		How people make decisions? Decisions involving multi objectives. SMART, alternatives to SMART
8	Decision Making Under Uncertainty		Expected Monetary Value (EMV) Limitations of EMV criterion. Single attribute utility, interpreting utility functions.
9	Developing a Decision Models		Decision matrices, decision trees, influence diagrams
10-11	Case Studies	TBA	
12-13	Group Presentations		