COURSE IDENTIFICATION FORM

Course Code and Name: IM5065 PROBABILISTIC APPROACHES TO BUILDING SAFETY				**Department of :** CIVIL ENGINEERING / MASTER PROGRAMME			
Semester	**Theoretic Hour**	**Practice Hour**	**Total Hour**	**Credits**	**ECTS**	**Education Language**	**Type: Compulsory Elective**
Atumn/Spring	3	0	3	3	5	Turkish	Optional
Prerequisite (s)							
Instructor						**Mail :** **Web :**	
Course Assistant						**Mail :** **Web :**	
Groups / Classes							
Course Aim	To teach modeling engineering problems involving uncertainties and calculating the probability of collapse of systems.						
Course Goals	The role of probability in structural engineering, basic probability concepts, random variables, analytical models related to random events, discrete and continuous probability distributions, functions of random variables, estimation theory, testing of hypotheses, linear regression and correlation, reliability theory, reliability analyses and determination of structural collapse probabilities.						
Course Learning Outs and Proficiencies	Gündüz, A., Mühendislikte Olasılık, İstatistik, Risk ve Güvenilirlik, Birinci Baskı, Küre Basım Yayım, İstanbul, 1996 Ang, A. H-S., and Tang, W. H., Probability concepts in engineering planning and design, V.I, Basic principles, Wiley, New York, 1975 Ang, A. H-S., and Tang, W. H., Probability concepts in engineering planning and design, V.II, Decision, risk, and reliability, Wiley, New York, 1984 Nowak, A.S and Collins, K.R., Reliability of Structures, The McGraw-Hill Companies, USA, 2000. Ranganathan, R., Reliability analysis and design of structures, tata McGraw-Hill offices, New Delhi, 349 pp, 1990. Alacalı, S. N., Yapısal Güvenilirlik Ders Notları, 2012, Yıldız Teknik Üniversitesi, İstanbul						
Course Basic and Auxiliary Contexts	• Students will be able to determine the probabilistic reliability of structural systems. • Students will be able to determine the probabilistic failure of structural systems. • Students will be able to perform regression and correlation analyses.						
Methods of Give a Lecture	Face to Face						

Assessment Criteria		**If Available, to Sign (x)**	**General Average Percentage (%) Rate**
	Midterm Exam	**X**	**50**
	1. Quiz		
	2. Quiz		
	3. Quiz		
	4. Quiz		
	Oral Examination		
	Practice Examination (Laboratory, Project etc.)		
	Final Exam	**X**	**50**

Semester Course Plan

Week	Subjects
1	The role of probability in structural engineering and basic probability concepts
2	Random variables and probability distributions
3	Estimation theory, testing of hypotheses
4	Regression and correlation analysis
5	Determining the reliability of structural systems with third-order approach, Monte Carlo simulation
6	Second-moment approaches, linear limit state functions
7	Numerical applications
8	Midterm exam
9	Approaches to determining partial safety factors in structural design
10	Probabilistic design in structural engineering
11	Calculation of collapse probabilities of structural systems according to multiple failure modes, lower and upper limits
12	Numerical applications
13	Numerical applications
14	Numerical applications