STOCHASTIC PROCESSES

1	Course Title:	STOCHASTIC PROCESSES
2	Course Code:	END 5155
3	Type of Course:	Optional
4	Level of Course:	Second Cycle
5	Year of Study:	1
6	Semester:	1
7	ECTS Credits Allocated:	7.50
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	Undergraduate Level Probability and Statistics
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Doç. Dr. Fatih ÇAVDUR
15	Course Lecturers:	
16	Contact information of the Course Coordinator:	e-posta: fatihcavdur@uludag.edu.tr, Telefon: + 90 (224) 294 20 77 Adres: Uludağ Üniversitesi, Mühendislik-Mimarlık Fakültesi, Endüstri Mühendisliği Bölümü, Görükle Kampüsü, 16059 Nilüfer, Bursa
17	Website:	
18	Objective of the Course:	Learning basic concepts of stochastic processes.
19	Contribution of the Course to Professional Development:	
20	Learning Outcomes:	

		1	Being able to understand the basics of stochastic processes.
		2	Having knowledge of basic probability concepts.
		3	Being able to analyze real-life systems using stochastic processes.
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21	Course Content:	

Course Content:	

Week	Theoretical	Practice
1	Basic Probability Concepts -Sample Space, Events, Probabilities of Events -Basic Definitions and Theorems -Conditional Probability	

#	Topic	
2	Random Variables -Introduction to Random Variables, Definitions -Mean and Variance of Random Variables -Discrete Random Variables -Continuous Random Variables	
3	Expectation and Conditional Expectation -Definition of Expectation -Conditional Expectation -Computing Probabilities and Expectations using Conditioning	
4	Discrete Probability Distributions -Bernoulli Process and Binomial Distribution -Negative Binomial, Geometric, Hyper-Geometric Distributions -Poisson Distribution	
5	Continuous Probability Distributions -Uniform Distribution -Exponential Distribution -Normal Distribution -Gamma Distribution -Beta Distribution	
6	Discrete Markov Chains -Markov Chains, Definitions and Basic Concepts	
8	Continuous Time Markov Chains and Basic Concepts -Some Properties of Continuous Time Markov	
9	Continuous Time Markov Chains (cont.) -Applications	
10	Exponential Distribution and Poisson Process -Exponential Distribution, Definitions and	
11	Exponential Distribution and Poisson Process -Counting Process and Poisson Process -Some Properties of Poisson Process	
12	Queuing Theory -Basic Concepts, Notation -Long-Run or Steady-State Parameters -Basic Queuing Systems, M/M/1, M/M/c etc.	
13	Applications	
14	Student Project Presentations	
22	Textbooks, References and/or Other Materials:	1. Introduction to Probability Models; 10th Edition; Sheldon Ross; Academic Press 2. Stochastic Processes, Sheldon Ross, 2nd Edition; Wiley
23	Assesment	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	10.00	140.00
Homeworks	1	30.00	30.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm Exams	1	5.00	5.00
Others	0	0.00	0.00
Final Exams	1	8.00	8.00
Total Work Load			225.00
Total work load/ 30 hr.			7.50
ECTS Credit of the Course			7.50

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT	
Midterm Exam	1	25.00	
Quiz	0	0.00	
Home work-project	1	25.00	
Final Exam	1	50.00	
Total	3	100.00	
Contribution of Term (Year) Learning Activities to Success Grade		50.00	
Contribution of Final Exam to Success Grade		50.00	
Total		100.00	
Measurement and Evaluation Techniques Used in the Course			

24	ECTS / WORK LOAD TABLE

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS

	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	1	5	3	1	1	1	1	1	5	4	4	1	1	1	1	1
ÖK2	1	5	3	1	1	1	1	1	5	4	4	1	1	1	1	1
ÖK3	1	5	3	1	1	1	1	1	5	4	4	1	1	1	1	1

LO: Learning Objectives   PQ: Program Qualifications

Contribution Level:	1 very low	2 low	3 Medium	4 High	5 Very High