

School of Engineering and Natural Sciences / Industrial Engineering (English)

2023 - 2024 Academic Year

STOCHASTIC MODELS

Syllabus

Course Description					
Name	Code	Semester	T+A Hour	Credit	ECTS
STOCHASTIC MODELS	IND2249060	Spring Semester	3+0	3	6
Prerequisites Courses	OLASILIK VE RASSAL DEĞİŞKENLER				
Recommended Elective Courses					
Language of Instruction	English				
Course Level	First Cycle (Bachelor's Degree)				
Course Type	Required				
Course Coordinator	Assoc.Prof. Yasin GÖÇGÜN				
Name of Lecturer(s)	Assoc.Prof. Yasin GÖÇGÜN				
Assistant(s)	Teaching Assistant: Ersin Durmuşkaya (medurmuskaya@medipol.edu.tr)				
Aim	This course aims to introduce basic stochastic models in order to deal with uncertainties in Industrial engineering problems and presents how to develop Markov models to reflect stochastic processes faced in real life situations.				
Course Content	This course contains; Introduction to the Course,Review of Probability Theory,Conditional Probability and Conditional Expectation,Introduction to Stochastic Processes and Markov Chains,Discrete Time Markov Chains-1,Discrete Time Markov Chains-2,The Exponential Distribution and Poisson Process-1,The Exponential Distribution and Poisson Process-2,Continuous Time Markov Chains-1,Continuous Time Markov Chains-2,Queuing Systems-1,Queuing Systems-2,Queuing Systems-3,General Review.				
Course Learning Outcomes			Teaching Methods	Assessment Methods	
Students differentiate deterministic and stochastic cases.			16, 6, 9	A, E	
Students implement modeling methodologies of uncertainty in industrial engineering problems.			16, 6, 9	A, E	
Students define the exponential distribution and its relationship with the Poisson process.			16, 6, 9	A, E	
Students analyze Markov Chain models.			16, 6, 9	A, E	
Students define queuing theory.			16, 6, 9	A, E	
Teaching Methods	16: Question - Answer Technique, 6: Experiential Learning, 9: Lecture Method				
Assessment Methods	A: Traditional Written Exam, E: Homework				
Lecture Schedule					
Sequence	Topics	Preliminary Preparation			
1	Introduction to the Course				
2	Review of Probability Theory				
3	Conditional Probability and Conditional Expectation				
4	Introduction to Stochastic Processes and Markov Chains				
5	Discrete Time Markov Chains-1				
6	Discrete Time Markov Chains-2				
7	The Exponential Distribution and Poisson Process-1				
8	The Exponential Distribution and Poisson Process-2				
9	Continuous Time Markov Chains-1				
10	Continuous Time Markov Chains-2				
11	Queuing Systems-1				
12	Queuing Systems-2				
13	Queuing Systems-3				
14	General Review				
Evaluation Methods		Weight(%)			
Midterm Exam		30			
General Exam		70			

Resources
Introduction to Probability Models by Sheldon Ross, Academic Press. Operations Research: Applications & Algorithms by W.L. Winston Thomson Operations Research: Applications & Algorithms by W.L. Winston Thomson, ISBN: 0-534-42362-0.