

The University of Jordan School of Engineering Industrial Engineering Department First semester 2022/2023

Course name:	Probabilistic Operations Research					
Course code:	IE 0916555					
Credits hours	3hr.					
Contact hours& room\office hours:	12:30-13:30 Sunday, Tuesday, and Thursday. Office hours: 11:30 – 12:30 (in person) Sunday, Tuesday, and Thursday.					
	Prof. Dr. Mohammad D. AL-Tahat					
Course instructor's name, E-mail,	altahat@ju.edu.jo					
and phone.	Phone: 22933					
Course Coordinator:						
Textbook:	Hamdy A. Taha. Operations Research: An introduction. Prentice hall, 10 th edition.					
Other reference(s):	 Instructor's notes Paul A. Jenson and Jonathan F. Bard. Operations Research Models and Methods. John Wiley & Sons. ISBN 0-471- 38004-0. 					
Course Description:	This course introduces Probabilistic and stochastic models used to investigate the behavior of industrial systems; queuing theory, queuing models, queuing networks and its applications, discrete and continuous Markov processes, and related mathematical analysis.					
Providing Department:	Industrial Engineering					
Prerequisite Course:	0916357 + 0906356					
Course type	Required (Mandatory)					
Assessment Methods:	Method		Weight %	Date		
	In-class activities and short exams		20			
	Mid Exam		30	Tuesday 6/12/2022		
	Final Exam		50			
				1		
Course Learning Outcomes:	#	After successful completion of this course, the student will be able to		' SO		
	CLO1	Gain essential knowledge and skills that will help in understanding queuing theory and related elements and terminology		1		
	CLO2	CLO2 Master the mathematics of queuing models and analyze its performance.		1		
	CLO3 Learn the queuing networks and how to evaluate their performance.		1			
	CLO4 Practice the algebraic analysis of discrete-time Markov process		1			
	CLO5	Master the algebraic continuous-time Markov pr	analysis of rocess	1		

	Week #	Торіс	
	1	General Course Orientation	
	1-10	 Queuing Theory: Why queues form, elements of queue, generalized queuing model. Specialized Poisson queues. Mathematics of evaluating steady state measures of performance for single and multiple servers' models, and for limited and unlimited queuing models. Applications Queuing networks, modeling and analysis of queuing networks Real life applications of queuing networks. 	
Brief list of topics 10-15		 Markov Chains and Stochastic analysis Definitions of stochastic process Definition of Markov chains (CTMCs, and DTMCs) State transition diagrams Transition Matrix Classifications of states Modeling example (DTMC) Modeling the Game of craps (DTMC) Continuous-time Markov Chain Modeling the ATM example (CTMC) Absolute and n-step transition probabilities Chapman-Kolomogorov mathematics, Steady state probabilities and First return time First passage time Analysis of absorbing states Algebra of analyzing the Game of craps (DTMC) Model 	
	16	Assessments and evaluation	
Important Notes:	 16 Assessments and evaluation a. Do not hesitate to ask questions b. You are required to bring a notebook and take notes in classes. c. Students are expected to attend every class session and they are responsible for all material, announcements, schedule changes, etc., discussed in class. d. Discuss the assignments among yourselves e. Don't Cheat; direct copying of others work will NOT be allowed or tolerated and will result in a reduction of grade. If you are found to be cheating in any way, on an exam or assignment, even signing the roll sheet for another student, you will be given an "F" for the course. There will be no exceptions. f. All cases of academic dishonesty will be handled in accordance with university policies and regulations. JU policy requires the faculty member to assign ZERO grade (F) if a student miss 15% of the classes that are not excused, and 20% of the classes that are excused g. Students are expected to be ready to take a quiz any time they have a class. There will be no make-up quizzes or homework. h. Any students with disabilities who need accommodations in this course are encouraged to speak with the instructor as soon as possible to make appropriate arrangements for these accommodations. 		