



Jordan University of Science and Technology
Faculty of Computer & Information Technology
Network Engineering And Security Department

NES712 Performance Evaluation Of Computer Networks - JNQF Level: 9

First Semester 2023-2024

Course Catalog

3 Credit Hours. This course covers the application of probability theory to computer networks. Random processes, Little's theorem, birth-death processes, Markov chains, Multidimensional Markov chains, M/M/1, M/M/m, M/M/m/m, M/G/1 and G/G/1 queuing systems and their applications in computer networks. Loss models such as Erlang loss model and Engset loss model, Insensitivity and Generalization of loss models. Conservation laws, priority queues, and polling models. Traffic models such as Markovian traffic models and Long-Range Dependent (LRD) traffic models. Discrete event simulations, generation of random variables, variance reduction techniques and general purpose simulation languages.

Teaching Method: On Campus

Text Book

Title	Discrete Event System Simulation
Author(s)	Jerry Banks, John S. Carson II, Barry L. Nelson, and David M. Nicol
Edition	5th Edition
Short Name	Ref # 2
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref #1	The Art of Computer Systems Performance Analysis	Raj Jain	1st Edition	

Instructor

Name	Dr. ABDALLAH ALMA'AITAH
Office Location	-
Office Hours	Sun : 08:30 - 10:30 Mon : 08:30 - 09:30 Tue : 09:30 - 11:00 Thu : 10:00 - 11:30

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Class Schedule & Room

Section 1:
 Lecture Time: Mon, Wed : 10:00 - 11:30
 Room: NES01-E1L3

Tentative List of Topics Covered

Weeks	Topic	References
Weeks 1, 2	Random processes	From Ref # 2
Weeks 3, 4, 5	Queuing systems and their applications	From Ref # 2
Weeks 6, 7	Traffic models	From Ref #1
Weeks 8, 9, 11	Confidence intervals and variance reduction	From Ref #1
Weeks 10, 12	Student course presentations	
Weeks 13, 14, 15	Ratio games and metrics presentation	From Ref #1

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Understand the basic terms of performance analysis and evaluation. [1MSO1] [1L9K1]	11%	
Specify the common mistakes in performance evaluation and how to avoid them. [1MSO2] [1L9K2]	11%	
Understand Birth death process and its application in different Queuing techniques. [1MSO1] [1L9K2]	15%	
Understand the Basic Probability and Statistics Concepts: CDF, PDF, PMF, Mean, Variance, CoV, Normal Distribution. [1MSO1] [1L9S2]	7%	
Compare two or more systems using sample data and Critically identify the shortcomings in state of the art literature and suggest/implement improvements [1MSO4] [1L9S2]	45%	
Identify the desired properties of good random number generator and reflect them in input modelling. [1MSO2] [1L9K2]	11%	

Relationship to Program Student Outcomes (Out of 100%)													
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SO1	SO2	SO3	SO4	SO5	SO6	SO7	MSO1	MSO2	MSO3	MSO4	MSO5	MSO6	MSO7
							33	22		45			

Relationship to NQF Outcomes (Out of 100%)		
L9K1	L9K2	L9S2
11	37	52

Evaluation	
Assessment Tool	Weight
MidTerm Exam	15%
Presentations	15%
Progress reports	10%
Final report	30%
Final Exam	30%

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