



Jordan University of Science and Technology
Faculty of Engineering
Industrial Engineering Department

IE750 Operations Research And Management - JNQF Level: 9

First Semester 2023-2024

Course Catalog

3 Credit Hours. This course will introduce the students to advanced topics and applications of operations research particularly in the field of modeling, decision analysis and simulation. The course includes an introduction to nonlinear programming, decision making tools/trees and value of information, introduction to discrete event simulation systems, Markov chains and queuing theory. The course targets master students who have sufficient background in mathematics and probability models.

Teaching Method: On Campus

Text Book

Title	Operations Research: Applications and Algorithms
Author(s)	Wayne L. Winston
Edition	4th Edition
Short Name	Textbook
Other Information	

Instructor

Name	Prof. Dorid Dalalah
Office Location	M5L3
Office Hours	
Email	doraid@just.edu.jo

Class Schedule & Room

Section 1:
Lecture Time: Tue : 14:30 - 17:30
Room: M5124

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Introduction	From Textbook
Weeks 2, 3, 4	Nonlinear programming	From Textbook
Weeks 5, 6	Decision making under uncertainty	
Week 7	Decision trees	
Weeks 8, 9	Value of information	From Textbook
Week 10	Queuing theory. Markov chains. Simulation.	
Weeks 11, 12, 13	Markov chains	
Weeks 14, 15	Simulation	
Week 16	Final exams	

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Construct and analyze advanced optimization models for complex real-world systems. [1SO1] [1L9K1]	20%	First Exam, Final Exam, Assignments
Utilize analytical techniques and software to solve nonlinear optimization models. [1SO2, 1SO7] [1L9S1]	20%	First Exam, Second Exam, Final Exam, Assignments
Employ decision trees and decision-making tools to evaluate alternative courses of action under uncertainty. [1SO4, 1SO6] [1L9K2, 1L9K3, 1L9C1]	20%	First Exam, Second Exam, Final Exam, Assignments
Develop the capability to apply Markov chains to model and analyze dynamic systems. [1SO1, 1SO2] [1L9K2]	20%	Final Exam, Assignments
Design and implement queuing systems along with discrete event simulation systems to model stochastic processes. [1SO4, 1SO6] [1L9S1, 1L9C1]	20%	Final Exam, Assignments

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
30	20		20		20	10

Relationship to NQF Outcomes (Out of 100%)				
L9K1	L9K2	L9K3	L9S1	L9C1
20	26.67	6.67	30	16.67

Evaluation

Assessment Tool	Weight
First Exam	20%
Second Exam	25%
Final Exam	50%
Assignments	5%

Policy	
Attendance Policy	As per the university bylaws
Makeup policy	As per the university bylaws
Grading Policy	According to the criteria mentioned in the syllabus

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