Jordan University of Science and Technology

Faculty of Engineering

Industrial Engineering Department

IE458 Simulation - JNQF Level: 7
Second Semester 2023-2024

Course Catalog
3 Credit Hours. This course presents the basic concepts of computer simulation modeling of manufacturing, production, service, and other stochastic systems. Use of commercial simulation software environments to build, analyze, verify, and validate models. Use of mathematical and numerical modeling concepts as system design tools through statistical and optimization techniques.
Teaching Method: On Campus

Text Book	
Title	simulation with arena
Author(s)	W. David Kelton, Mcgraw Hill
Edition	5th Edition
Short Name	reference 1
Other Information	

Instructor	
Name	**Dr. MOHAMMED OBEIDAT**
Office Location	C5 L-2
Office Hours	
Email	msobeidat1@just.edu.jo

Instructor	
Name	**Dr. Lawrence Al Fandi**
Office Location	C5 L1
Office Hours	
Email	lmalfandi@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Mon, Wed : 10:00 - 11:30 Room: CAD LAB Section 2: Lecture Time: Mon, Wed : 11:30 - 13:00 Room: CAD LAB Section 3: Lecture Time: Sun, Tue, Thu : 10:30 - 11:30 Room: CAD LAB Section 4: Lecture Time: Sun, Tue, Thu : 11:30 - 12:30 Room: CAD LAB

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
294570	IE457 Operations Research (2)	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Introduction to Simulation	
Week 2	Introduction to Simulation and General Principles	From **reference 1**
Week 3	Behind the Scenes: How Simulation Languages Work	From **reference 1**
Week 4	Statistical Models (review):	From **reference 1**
Weeks 5, 6	Arena Concepts	From **reference 1**
Week 7	Random Number Generation	From **reference 1**
Week 8	Exam 1	
Week 9	Queuing Theory In Simulation	
Week 10	Verification and Validation of Simulation Models	
Week 11	Output Analysis for a Single System:	
Week 12	Analysis for Comparing Alternative Systems	
Week 12	Exam 2 (only Arena)	
Week 13	Input Analysis	
Week 14	Metamodeling and Optimization	

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
To learn basic concepts of computer simulation modeling of manufacturing, production, service, and other stochastic systems. Use of commercial simulation software environments to build, analyze, verify, and validate models. Use of mathematical and numerical modeling concepts as system design tools through statistical and optimization techniques. [1SO1, 1SO2, 1SO5, 1SO6, 1SO7] [1L7C4]	100%	

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

Relationship to NQF Outcomes (Out of 100%)
L7C4
100

Evaluation	
Assessment Tool	**Weight**
first	20%
second	20%
Final	40%
Project	20%

Policy	
Attendance	The first three absences (excused or unexcused) will result in no grade reduction. Each absence thereafter will result in a 1% reduction in the final score (100% maximum), which determines the grade. Perfect attendance will result in a 3% increase in the final score.
Homework	1- Homework is to be turned in at the beginning of class on the day it is due. 2- No points are awarded for late homework.
Student Conduct and academic integrity	It is the responsibility of each student to adhere to the principles of academic integrity. Academic integrity means that a student is honest with him/herself, fellow students, instructors, and the University in matters concerning his or her educational endeavors. Cheating will not be tolerated in this course. University regulations will be pursued and enforced on any cheating student.

Date Printed: 2024-02-20