	Hashemite University Prince Al-Hussein bin Abdullah II Faculty for Information Technology Department of Computer Information Systems	

Course Syllabus

Year: 2018-2019 **Semester: (2)**

Course No.	Course Title	Designation	Prerequisite	Co-requisite	Credit Hours Lectures /Lab.
151001373	Simulation and Modeling	Compulsory	15100xxxx	-	3 / 0

Instructor Name	E-mail	Office No.	Office ext.	Office Hours
Dr. Nabhan Hamadneh	nabhan@hu.edu.jo	241	-	Sat, Sun, Mon(11-12)
Coordinator's Name:	Dr. Nabhan Hamadneh			

Course Description	The purpose of the course is to have students understand the general principles of simulation model design and concepts of computer simulation. The course introduces students to simulation types, mathematical model types and simulation software and languages. The course covers in details simulation of discrete system (Discrete Event Simulation and simulation by different equations) and simulation of continuous system using differential equations with practical examples in management, banking, manufacturing and computer networks. Both Arena and MS Excel software are intended to be used throughout the course.

Learning References:

1- Textbook (s):
Jerry Banks, John S. Carson, II, Barry L. Nelson, David M. Nicol, Discrete-Event System Simulation, 5th Edition, Prentice Hall, ©2010
2- References:
1. W. David Kelton,..et..al, Simulation with Arena, 6th Edition, McGraw Hill, 2015
2. Averill Law, Simulation Modeling and Analysis, 5th Edition, McGraw Hill, 2014.
3. Manuel D. Rossetti., Simulation modeling and Arena, John Wiley & Sons, Inc., 2010.

Course Intended Learning Outcomes (ILOs)

Upon successful completion of this course, students are expected to achieve the following learning outcomes:

Course ILOs	Program ILOs	Teaching and Learning Method	Assessment Method
Have an understanding of differences between different types of simulations such as discrete event and continuous simulation models.	CIS-A, CIS-B	Lectures	Exam
Have knowledge of the important random numbers and frequency distributions in simulation mode	CIS-A, CIS-B	Lectures and Assignments	Exam and Assignments
List applications of simulation.	CIS-A	Lectures and Assignments	Exam and Assignments
Be able to formulate a simulation study and develop a simulation model within the simulation tools; such as Arena.	CIS-B	Lectures	Exam
Be capable of analyzing the result from simulation models	CIS-A, CIS-B CIS-D,	Assignments	Exam and Assignments
Design a model for a system	CIS-A	Assignments	Exam and Assignments
Implement a simulation for a real system	CIS-B	Lectures	Exam

Course Schedule:

Topic Details	Course ILO number	Reference	No. of Weeks	Contact hours*
Introduction to simulation	1	1	1	3
Simulation examples	2	1	2	6
General principles	2	1	2	6
Simulation software	3	1	2	6
Simulation with Arena: where Arena fits in	6	2.1	1	3
Simulation with Arena:Fundemental simulation concepts	5	2.1	2	6
A guided tour through Arena	4	2.1	2	9
Modeling basic operations and inputs	6	2.1	3	6
Total			**15**	**45**

Assessment Methods and Grading System:

Assessment method	Grade	Comments
First Exam	25%	Covers Chapters 1,2,3
Second Exam	25%	Covers Chapters 4,5,6
Assignments	10%	TBA
Final Exam	40%	Covers all topics that were discussed during the semester
Total	100%	

Course Relationship to Key Student Outcomes:

#	Student Outcome Description	Contribution
General and Computer Information System Student Outcomes		
CIS-A	Be able to apply basic math and statistics including the differences between discrete event and continuous simulation models, important random numbers generators and frequency distributions	**H**
CIS-A	List applications of simulation	**M**
CIS-G	Be able to formulate, design, and implement a simulation solution for real problems or modelled ones in business areas such as scheduling and warehouse systems using simulation techniques with or without a simulation tool such as Arena	
CIS-D	Work in a group in order to implement a simulation project	**L**
CIS-F	Present the final work (project) and make a demo	
H=High, **M**= Medium, **L**=Low		