CPIS-424 Syllabus

Catalog Description

CPIS-424 Modeling and Simulations
Credit: 3 (Theory: 3, Lab: 2, Practical: 1)
Prerequisite: CPIS-250
Classification: Elective

The objective of this course is to develop the student's ability to understand the basic concepts in modeling and simulation and develop discrete event simulation models. Topics include basic simulation modeling, simulation input and output analysis, validation and verification of simulation models, and building simulation models using Arena and MS Excel.

Class Schedule

Meet 50 minutes 3 times/week or 80 minutes 2 times/week

Lab/Tutorial 90 minutes 1 times/week

Textbook

Averill Law, , "Simulation Modeling and Analysis with Expertfit Software", McGraw-Hill Science/Engineering/Math; 4 edition (2006-07-21)

ISBN-13 9780073294414 **ISBN-10** 0073294411

Grade Distribution

Week	Assessment	Grade %
8	Exam 1	15
10	Graded Lab Work 1	1
11	Graded Lab Work 2	2
12	Exam 2	20
12	Graded Lab Work 3	2
14	Formal Presentation	5
14	Group Project	20
15	Lab Exam	5
16	Exam	30

Last Articulated

May 21, 2017

Relationship to Student Outcomes

a	b	c	d	e	f	g	h	i	j
x		x						x	

Course Learning Outcomes (CLO)

By completion of the course the students should be able to

1. Identify need for simulation, simulation types and applications (a)
2. **Apply basic computer simulation on simple example. (i)**
3. Use Discrete-event modeling and simulation to better understand simulation concepts (a)
4. Differentiate between discrete and continuous simulation (a)
5. **Recognize the types of modeling formalizm (c)**
6. Express system model by informal representation (c)
7. Apply empirical input modelling to simulation system (a)
8. Discuss different distribution methods (i)
9. **Use heuristic methods and goodness of fit tests to identify the probability distribution that best fits the input data (a)**
10. Represent input modeling for arrival, service, and other applications (a)
11. **Define Event-graph excution rules (a)**
12. Construct Event graph model for some applications (c)
13. Represent parameterized Event Graph for some applications (a)
14. Define Activity graph modeling and simulation (a)
15. **Use Commertial modeling and simulation tool to represent some applications (c)**

Coordinator(s)

Prof. Manal Abdullah, Professor

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Topics Coverage Durations

Topics	Weeks
Basics of Computer Simulation	2
Introduction to Discrete-Event System Modeling & Simulation	4
Input Modeling for Simulation	4
Introduction to Event-based Modeling & Simulation	2
Parameterized Event Graph Modeling and Simulation	1
Introduction to Activity Graph Modeling and Simulation	1
Software packages for M&S	1