

Course Syllabus

1. Program of Study	Bachelor of Science (Computer Science)	
Faculty/Institute/College	Mahidol University International College	
2. Course Code	ICCS 477	Course Title System Simulation
3. Number of Credits	4 (Lecture/Lab) (4-0)	
4. Prerequisite(s)	ICSC 303, ICCS 365	
5. Type of Course	Elective	
6. Trimester / Academic Year	2 nd trimester / every academic year	

7. Course Description

Mathematical modeling of systems. Stochastic processes. Study of analytical and discrete-event simulation models. Verification and validation procedures. Programming techniques. Special purpose simulation languages. Simulation experiments.

8. Course Objective(s)

After the completion of the course, students will

1. understand the concepts of simulation, ie., physical, mathematical, and computerized modelings,
2. be able to plan, analyze, conceptualize, and design simulation models of real world systems,
3. be able to appropriately collect data and implement models using programming languages and tools,
4. be able to verify and validate models against the real systems,
5. be able to analyze the simulation outputs, comparing two or more alternative solutions.

9. Course Outline

Week	Topic				Instructor
	Lecture	Hour	Lab	Hour	
1	Introduction to the course, nature of simulation	4	-	-	Dr. Udom Silparcha
2	Types of simulations, simple simulation practices, tools for simulation, programming and simulation languages	4	-	-	
3	Fundamental simulation concepts, discrete-event simulation model	4	-	-	
4	Designing models, conceptual models, data collection and analysis	4	-	-	
5	Probability distributions, random variates, random	4	-	-	

	number generators, Monte Carlo simulation			
6	Midterm Examination Models, Animation.	4	-	-
7	Systems dynamics modeling using Arena	4	-	-
8	Model building	4	-	-
9	Model verification and validation	4	-	-
10	Output analysis, Comparing alternative system configurations	4	-	-
11	Experimental simulation design and optimization	4	-	-
	Total	44		0

10. Teaching Method(s)

1. Lectures
2. Tests / Assignments
3. Project

11. Teaching Media

1. Textbooks
2. Lecture notes
3. Powerpoint presentations
4. Demonstrations

12. Measurement and evaluation of student achievement

Marks	Grade
81 or more	A
76 – 80	B+
71 – 75	B
66 – 70	C+
61 – 65	C
56 – 60	D+
51 – 55	D
50 or less	F

13. Course evaluation

Components	%
Tests & Assignments	15
Project	15
Midterm Exam	30
Final Exam	40
Total	100

14. Reference(s)

1. Charles Harrell; Biman K. Gosh; Royce O. Bowden, Jr., “*Simulation Using Promodel*”, McGraw-Hill, 2004.

2. Averill Law, W. David Kelton, “*Simulation Modeling and Analysis*”, 3rd Ed., McGraw-Hill, 2000.
3. W. David Kelton, Randall P. Sadowski, Deborah A. Sadowski, “*Simulation with Arena*”, 2nd. Ed., McGraw-Hill, 2002.
4. James R. Evans, David L. Olson, “*Introduction to Simulation and Risk Analysis*”, 2nd Ed., Prentice Hall, 2002.

15. Instructor(s)

Dr. Udom Silparcha

16. Course coordinator

Dr. Udom Silparcha