Graduate Course Syllabus

IT 630: Computer Simulation and Modeling

Center: Online

Course Prerequisites

IT 501 and IT 510

Course Description

This course focuses on the theory and practice of discrete-event system simulation. Topics include simulation modeling and analysis techniques and methodologies employed in businesses and industry. Applications include computer and network modeling, manufacturing simulation, scheduling, and queuing systems. Queuing theory, input and output statistical analysis, and business process re-engineering are included. The emerging field of serious games and virtual worlds is explored. Modeling software is used.

Course Outcomes

- Identify the place of computer simulation and modeling principles, techniques, and software using appropriate terms for the computer analyst
- Identify problems that are candidates for discrete-event computer simulation modeling solutions
- Evaluate the efficacy of problem statement, expected results, and modeling/analysis issues
- Apply the simulation modeling and analysis (SMA) project lifecycle, and apply SMA principles to a problem situation using simulation software
- Identify, create, manage, and evaluate data-driven models
- Identify and interpret best-fit data distributions and use to drive simulation models
- Create, implement, and evaluate base and “what-if” alternative models
- Describe and implement experimental design parameters with multiple replications
- Assess the possibilities for simulations applied to business process re-engineering
- Evaluate where and when serious games and virtual worlds can be useful simulations

Required Materials

Using your learning resources is critical to your success in this course. Please purchase directly through SNHU’s online bookstore, MBS Direct, rather than any other vendor. Purchasing directly from the bookstore ensures that you will obtain the correct materials and that the Help Desk, your advisor, and the instructor can provide you with support if you have problems.

Your resources in this course include:

1. eText: *Applied Simulation: Modeling and Analysis Using FlexSim* 4th Edition (available as a PDF or in an ePub format)
2. Supplemental Documents from FlexSim
3. FlexSim 7.3.4 Software
4. Student license code for FlexSim

Click here to get directions for paying for and receiving your materials.

The direct link that you will be using to purchase and download your materials is http://www.flexsim.com/snhu.

After you purchase, your materials will also be available on this page.

Additionally this course uses VISIO 2010, which can be download free through DreamSpark.

Southern New Hampshire University students are able to obtain discounted, often free, Microsoft software for IT and DAT courses through the DreamSpark program. Go to the SNHU Academic Software Center and request an account from the right panel to begin managing your software.

In Visio 2010, try File/New/Flowchart/Basic Flowchart OR MS Word OR you can draw a flowchart in PowerPoint.

Instructor Availability and Response Time

Your class interaction with your instructor and your classmates will take place in Blackboard on a regular, ongoing basis. Your instructor will be active in Blackboard at least five days a week, and you will normally communicate with your instructor in the open Blackboard discussion forum so that your questions and the instructor's answers benefit the entire class. You should send emails directly to your instructor only when you need to discuss something of a personal or sensitive nature, and in those cases your instructor will generally provide a response within 24 hours.

Grade Distribution

Assignment Category	Number of Graded Items	Point Value per Item	Total Points
Discussions	6	25	150
Short Papers	3	35	105
FlexSim Tutorials	5	10	50
FlexSim Activities	7	30	210
Final Project			
Milestone One	1	100	100
Milestone Two	1	200	200
Milestone Three	1	200	200
		Total Course Points:	1,015

This course may also contain practice activities. The purpose of these non-graded activities is to assist you in mastering the learning outcomes in the graded activity items listed above.

University Grading System: Graduate

		Total Points:	*1015*	
Grade	**Numerical Equivalent**	**Points**	**Points Equivalent**	
			Lower	*Upper*
A	93-100	4.00	944	1015
A-	90-92	3.67	914	943
B+	87-89	3.33	883	913
B	83-86	3.00	842	882
B-	80-82	2.67	812	841
C+	77-79	2.33	782	811
C	73-76	2.00	741	781
F	0-72	0.00	0	740
I	Incomplete			
IF	Incomplete/Failure*			
W	Withdrawn			

*Please refer to the policy page for information on the incomplete grade process.

Grading Guides

Specific activity directions, grading guides, posting requirements, and additional deadlines can be found in the Course Information area in the Assignment Guidelines and Rubrics folder.

Weekly Assignment Schedule

The Learning Modules area in Blackboard contains one module folder for each week of the course. All reading and assignment information can be found in the folders. All assignments are due by 11:59 p.m. Eastern Time on the last day of the module week.

In addition to the textbook readings that are listed, there may be additional required resources within each module in Blackboard.

Module	Topics and Assignments
1	Modeling Reality and Unreality Reading: *Applied Simulation Flexsim*, Preface, Chapters 1 and 2 1-1 Discussion: Winter Simulation Conference 1-2 FlexSim Tutorial: Module One Tutorials 1-3 Short Paper: The Importance of Simulations

2	The Power of Simulation: Solving Problems and Supporting Decision Making Reading: *Applied Simulation Flexsim*, Chapters 3, 4, and Appendix 3 2-1 Discussion: FlexSim Run 2-2 Short Paper: SMA Roles 2-3 FlexSim Tutorial: Module Two Tutorials
3	Building and Managing: SMA Projects Step by Step Reading: *Applied Simulation Flexsim*, Chapter 5 and Appendix 5; Chapter 6 and Appendix 6 3-1 Discussion: FlexSim Help Facility 3-2 FlexSim Tutorial: Module Three Tutorials 3-3 FlexSim Activity: Module Three Exercises 3-4 Short Paper: Object Flow Diagram
4	Representing System Behavior: Model Logic Is the Key Reading: *Applied Simulation Flexsim*, Chapter 7 and Appendix 7; Chapter 8 and Appendix 8 4-1 Discussion: FlexSim Videos 4-2 FlexSim Example: Module Four Example 4-3 FlexSim Tutorial: Module Four Tutorials 4-4 FlexSim Activity: Module Four Exercises
5	Probability Distributions: Everything You Wanted to Know about Randomness and Variability Reading: *Applied Simulation Flexsim*, Chapter 9 and Appendix 9 5-1 Final Project: Milestone One 5-2 FlexSim Activity: Module Five Exercise
6	Data-Driven Decisions: Simulation Output Analysis Reading: *Applied Simulation Flexsim*, Chapter 10 and Appendix 10 6-1 FlexSim Activity: Module Six Exercises 6-2 FlexSim Activity: Module Six Exercise
7	Reliability: Customizing Model Logic Reading: *Applied Simulation Flexsim*, Chapter 11 and Appendix 11; Chapter 12 and Appendix 12 7-1 FlexSim Examples: Module Seven Examples 7-2 FlexSim Activity: Module Seven Exercises 7-3 Final Project: Milestone Two
8	Object Communication: Let's Talk Reading: *Applied Simulation Flexsim*, Chapter 12 and Appendix 12; Chapter 13 and Appendix 13 8-1 FlexSim Example: Module Eight Examples 8-2 FlexSim Tutorial: Module Eight Tutorial 8-3 FlexSim Activity: Module Eight Exercises
9	Production Schedules and Advanced Modeling Techniques: Get in Line Reading: *Applied Simulation Flexsim*, Chapter 15 and Appendix 15; Appendix: Interacting with Other Applications; and Appendix: Advanced Techniques 9-1 Discussion: Serious Games and Simulation 9-2 Final Project: Milestone Three
10	The Cyberscape: Serious Games and Simulations 10-1 Discussion: Reflection 10-2 FlexSim Tutorial: Module Ten Tutorial

Attendance Policy

Online students are required to post to the Blackboard discussion board during the first week of class. If a student does not submit a posting to the discussion board during the first week of class, the student is automatically withdrawn from the course for non-participation. Review the full attendance policy.

Late Assignments Policy

Meeting assigned due dates is critical for demonstrating progress and ensuring appropriate time for instructor feedback on assignments. Students are expected to submit their assignments on or before the due date. Review the full late assignment policy.

SNHU College of Online and Continuing Education Guide to Student Success

Review the guide to student success.

Diversity and Disability Statement

The College of Online and Continuing Education (COCE) at SNHU values diversity and inclusion. SNHU strives to create inclusive and welcoming academic environments. If there are aspects of the instruction or design of this course that present barriers to your inclusion, please notify the Disability Resource Center (DRC) as soon as possible. We will work with you and your instructor to address needs and concerns.

We encourage all students with known or suspected physical, medical, sensory, psychiatric, and/or learning disabilities to register with the Disability Resource Center (DRC) in order to assess learning needs and take advantage of available academic accommodations and support services. We look forward to hearing from you. Our contact information is below.

Disability Resource Center (DRC)
(877) 591-4723 (select option 4)
(877) 520-8916 (fax)
drc@snhu.edu

We welcome COCE students, faculty, and staff to consult with the Disability Resource Center (DRC) on disability-related questions or concerns.

Academic Honesty Policy

Southern New Hampshire University requires all students to adhere to high standards of integrity in their academic work. Activities such as plagiarism and cheating are not condoned by the university. Review the full academic honesty policy.

Copyright Policy

Southern New Hampshire University abides by the provisions of United States Copyright Act (Title 17 of the United States Code). Any person who infringes the copyright law is liable. Review the full copyright policy.

SNHU College of Online and Continuing Education Withdrawal Policy

Review the full withdrawal policy.

Southern New Hampshire University Policies

More information about SNHU policies can be found on the policy page.

Assessment Calibration and Student Work Samples

For the purpose of continuous improvement of our educational training, Southern New Hampshire University's College of Online and Continuing Education may, on occasion, utilize anonymous student work samples for internal professional development and staff training. If you have any questions or concerns, contact your advisor. If you would like to withdraw permission for use of your work, please contact the assessment calibration administrator at assessmentcalibration@snhu.edu. See this document for more information.