The University of Texas at Tyler
Master of Science in Computer Science

Course Syllabus

1 December 2008

Course Number:	***COSC 5377***
Course Title:	Fundamentals of Modeling and Distributed Simulation of Complex Systems
Course Description: (Catalog) This course aims to teach the fundamentals of modeling, simulation, distributed simulation, and large-scale asynchronous distributed simulation of real systems on parallel processors. Examples from the real-world include CAD of digital systems, IVHS, etc.	
Pre-requisites:	Graduate standing
Credits:	3.0
Text(s): No prescribed text book (Reference book: Modeling and Asynchronous Distributed Simulation: Analyzing Complex Systems, Sumit Ghosh and Tony Lee, IEEE Press/Wiley Publishers, 2000)	
Languages Used: (if applicable)	None
Topics: 1. The Nature of Physical and Natural Systems 2. The Nature of Simulation 3. The Role of Time and Causality in Simulation 4. Principles of Modeling Complex Systems. 5. Principles of Simulation -- Time-Based, Event Driven 6. Synthesis of Uniprocessor Simulations 7. Principles of Large-Scale Distributed Simulation 8. Monitoring, Data Acquisition and Analysis, Meta-Performance Analysis	
Additional Materials:	None

Evaluation Method: (only items in dark print apply)	
1. **Examination/Quiz**	2. Homework
3. Paper/Report	4. Computer Program
5. **Project**	6. Presentation
7. **Class Participation**	8. Peer Review
9.	10.

Course Objectives[1]: By the end of this course students are expected to:
1. Modeling real-world systems (1,5,7)
2. Simulation of real-world systems (1,5,7)
3. Time-based simulation (1,5,7)
4. Discrete-event simulation (1,5,7)
5. Performance analysis (1,5,7)
[1] *Numbers in round brackets refer to method(s) used to evaluate the course objective.*

Relationship to Program Outcomes: (only items in dark print apply)[2] **This course supports the following computer science graduate program outcomes, which state that our students at the time of graduation are expected to:**
1. possess an enhanced breadth of knowledge in computer science, combined with a depth of knowledge in critical core areas of computing; (1,2,3,4,5)
2. possess the skills and knowledge for lifelong learning in computer science; (1,2,3,4,5)
3. possess knowledge of the theoretical foundations of computing and have strong practical application experience; (1,2,3,4,5)
4. posses and demonstrate oral and written communication skills; (1,2,3,4,5)
5. understand and respect the professional standards of ethics expected of a computer scientist and be knowledgeable concerning the history of computing field;
6. possess a knowledge of computer security and computer security management;
7. analyze and compare relative merits of alternative software design, algorithmic approaches, and computer system organization, with respect to a variety of criteria relevant to the task (e. g. efficiency, scalability, security); and
8. implement algorithms in multiple programming languages, on multiple hardware platforms, and multiple operating system environments.
[2]Numbers in brackets refer to course objective(s) that address the Program Outcome.