KENNESAW STATE UNIVERSITY

SYLLABUS

COLLEGE OF COMPUTING AND SOFTWARE ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE

CS 4632: MODELING AND SIMULATION

ACADEMIC TERM: SPRING 2020

Course Information

Class meeting time: TBD
Modality: Traditional On Campus and Fully Online.
Location: TBD

Instructor Information

Name: TBD
Email: TBD
Office Location: TBD
Office phone: TBD
Office Hours: TBD
Preferred method of communication: TBD

Course Description

Catalog Description:

This course covers the modeling and simulation of the structure and behavior of real-world systems using object-oriented discrete-event simulation techniques. The course emphasizes the modeling and computer programming perspective of simulation; design and implementation of simulation models. The fundamental concepts of object-oriented simulation are introduced. Model implementation will require programming in an object-oriented simulation language such as OOSimL, or in a general purpose programming language (Java or C++). Students will also be exposed to a commercial integrated simulation software tool: Arena.

Prerequisites: CS 3305

Credit Hours: 3-0-3

Course Materials

Required Text:

Object Oriented Simulation: A Modeling and Programming Perspective. Garrido, José M. ISBN: 978-1-4419-0515-4. Springer, 2009.

Recommended Texts:

Simulation with Arena. W David Kelton, Randall P. Sadowski, and David T. Sturrock, 5th Ed., McGraw-Hill Higher Ed, 2007. ISBN: 13-978-0-07-352341-5. Recommended reference.

Discrete-Event System Simulation. Banks, Jerry, John Carson and Barry Nelson. Prentice-Hall, 1995. ISBN 0-13-217449-9. Recommended reference.

Technology requirements: TBD

Learning Outcomes

Upon the completion of the course, students should be able to

1. Understand and be able to describe the structure and dynamic behavior of various types of systems
2. Design the conceptual models in UML for most of the properties of systems
3. Implement simulation models with an object oriented simulation language
4. Implement simulation models using a commercial integrated software tool such as Arena
5. Carry out general discrete-event simulation runs and provide basic analysis of results
6. Develop a project on developing a simulation model for a selected application domain, or a research paper on some aspect of modeling and simulation

Course Requirements and Assignments

Summary of Assignments:

1. Midterm Exam
2. Final Exam
3. Class Project
4. Assignments: Discrete-Event Simulation, Multiple-Server Models, Models with Interrupts

Evaluation and Grading Policies

The final grade will be assessed based on students' progress and findings as follows:

Assessment Criteria:	
Quizzes	20%
Homework assignments	20%
Exam I	30%
Exam II	30%

Grading Scale:	
A	90% - 100%
B	89% - 80%
C	79% - 70%

D	69% - 60%
F	59% or below

Students will receive feedback on each assignment/presentation within one to two week of the assignment/presentation due date.

Course Policies

Attendance:
Class attendance is required and very important for successful completion of the course. Students are expected to attend every class and participate in the discussion of research ideas developed by others in the class. Peer feedback is essential and is part of the grade assigned to each of the course assignments stated above. Excused absences must be planned for, when possible, and justified with documentation. The student is responsible for making up missed class sessions. Late arrival that causes disruption, early departure that causes disruption, excessive conversation among students (a disruption in its own right), inappropriate use of electronic devices that cause disruptions and other actions that disrupt the classroom are unacceptable.

Class Participation:
Thoughtful, prepared class participation is essential. This research seminar is designed to give students opportunities to engage classmates and professors in conversations about the research process related to computer science. Some conversations started in this seminar will eventually carry over to their graduate work. Students should take advantage of this opportunity to build their research community by engaging fully in class discussions with fellow students and faculty.

Faculty Conversations:
In preparation for the conversations with CS faculty about the research process/method, students must complete assigned background reading. There will articles or book chapters assigned per class. In addition to the assigned articles or chapters, students should review the background information on the professor.

Email Policy:
Students are encouraged to use only their official KSU email account since emails from other accounts may not successfully reach the instructor. Piazza will be used to facilitate interaction between class members.

Classroom Behavior:
All students are reminded to conduct themselves in accordance with the Student Code of Conduct, as published in the University Catalog. Every KSU student is responsible for upholding the provision. Students who are in violation of KSU policy will be asked to leave the classroom and may be subject to disciplinary action by the University.

Department or College Policies

Students are expected to be aware that the Computer Science department has certain policies in place that govern practices within the department including:

1. “B” or better grade is required for CS 1321/L and CSE 1322/L and their equivalent transfers. All courses used toward any undergraduate degree in the computer science must be completed with an assessed performance grade of "C" or better. This means that all prerequisite courses from the

CS Department must have been completed with a "C" or better in order for a student to enter the next course in a sequence.

2. All requests for course overloads must be made through the College advising office and with the approval of the Program coordinator and department chair. The instructor of any course is not permitted to authorize course overloads.

3. All requests for prerequisite bypasses must be made through the College advising office and with the approval of the Program coordinator and department chair. The instructor of any course is not permitted to authorize course overwrites.

4. All students are encouraged to register their current choice of major using the department major change process. Students who are not recorded under their intended major may find that they may be limited from registering for courses they require to complete their intended program of study.

Institutional Policies

Please visit each of the following links for Institutional policies.

Federal, BOR, & KSU Course Syllabus Policies:

https://curriculum.kennesaw.edu/resources/federal_bor_ksu_student_policies.php

Student Resources:

https://curriculum.kennesaw.edu/resources/ksu_student_resources_for_course_syllabus.php

Academic Integrity Statement:

https://scai.kennesaw.edu/codes.php

KSU Student Resources

This link contains information on help and resources available to students:

https://curriculum.kennesaw.edu/resources/ksu_student_resources_for_course_syllabus.php

Course Schedule

Course Topics and Outline: Subject to change and more details

Week	Topic
1	Introduction to Modeling and Simulation
2	Techniques for Discrete-Event Simulation: Object Orientation Assignment
3	Modeling and Simulation with an Integrated Simulation Software Tool (Arena)
4	Review of Object-Oriented Modeling
5	Simulation with the Process Interaction Approach

6	Single-server Simulation Models, Case Studies
7	Review- Midterm Exam
8	Simulation with Multiple-Server Models, Case Studies Assignment
9	Models with Resources, Case Studies
10	Advanced Process Interaction: Synchronous Cooperation, Case Studies
11	Conditional Waiting, Case Studies
12	Models with Interrupts, Case Studies Assignment
13	Overview of Basic Applied Probability Theory
14	Simulation Output Analysis: Overview Project: Demo/Presentations
15	Emerging Topics; Review for Final Exam
16	Final Exam