

Fayetteville State University
College of Arts and Sciences
Department of Mathematics and Computer Science
CSC 360-01 Introduction to Computer Simulation
Course Syllabus, Fall Semester, 2011

I. Locator Information:

Instructor: Dr. K. C. Wong

Course # and Name: CSC360-01

Semester Credit Hours: 3

Day and Time Class Meets: **T, R: 3:45 p.m. – 5:00 p.m.**

Total Contact Hours for Class: 36.25

Building and Room Class Meets: **SBE 221**

Office Location: SBE 343

Office hours: M, W: 4:00 p.m. – 5:00 p.m.

T, R: 11:00 a.m. – 2:00 p.m.

Office Phone: (910) 672-1697.

Email address: kwong@uncfsu.edu

TEST 1..... Tuesday, September 13, 2011

TEST 2..... Tuesday, October 11, 2011

TEST 3..... Tuesday, November 15, 2011

Final Exam: 4:00 – 5:50 p.m. Tuesday, December 6, 2011

FSU Policy on Electronic Mail: Fayetteville State University provides to each student, free of charge, an electronic mail account that is easily accessible via the Internet. The university has established email as the primary mode of communicating with enrolled students about impending deadlines, upcoming events, and other information important to student progression at the university. Students are responsible for reading their email on a regular basis to remain aware of important information disseminated by the university. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail.

Students making inquiries via email to FSU faculty and staff about academic records, grades, bills, financial aid, and other matters of a confidential nature are required to use their FSU email account.

Rules and regulations governing the use of FSU email may be found at:

<http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf>

II. Course Description:

This course introduces simulation and modeling of systems with concentration on discrete stochastic systems. Topics include modeling and simulation techniques, Monte Carlo methods, queuing models, and computer simulation languages such as GPSS, PYTHON and SIMSCRIPT. A simulation project is developed, completed, and presented by each student as a member of a project team.

PREREQUISITE: MATH 142 And proficiency in a programming language.

III. Disabled Student Services: In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability to please contact the Center for Personal Development in the Spaulding Building, Room 155 (1st Floor); 910-672-1203.

IV. Textbook:

Frank L. Severance, SYSTEM MODELING AND SIMUJLATION, An Introduction, Wiley & Sons, Ltd, 2001

V. Student Learning Outcomes:

Upon completion of this course, the student will be able to:

1. Demonstrate an understanding of the goals and objectives of computer simulation.
2. Demonstrate an understanding of computer simulation processes and procedures.
3. Demonstrate a deep understanding of the problems simulated.
4. Change the simulation model by adjusting values of key parameters.

5. Demonstrate the ability to use the Python Interactive and IDLE for VPython environments to run programs.
6. Acquire the knowledge on Python's type and operations, statements and syntax, functions, modules, classes, and exceptions.
7. Develop simulation models using a general purpose programming language (e.g. Python) to simulate standard problems from the natural sciences,(e.g. Physics, Chemistry, and Biology).
A standard programming language will be used instead of a higher-level simulation language so that students learn how to develop the building blocks used in simulations instead of using a simulation language that has those building blocks as pre-existing language constructs. The course will develop simulations of well-known problems from the natural sciences to reinforce concepts in problems. Problems will be chosen that require a graphical or animated presentation to represent change or motion. All problems will also reflect key components of calculus .

VI. Course Requirements and Evaluation Criteria:

2 highest test scores out of 3 tests totaling.....	30%
8 programming assignments totaling	30%
Final Exam.....	40%
+_____	
Semester_Grade_Points (SGP)	100%

Semester Grade Semester_Grade_Points

A	92% - 100%
B	83% - 91%
C	73% - 82%
D	64% - 72%
F	0% - 63%

WN See the University's Attendance/Withdrawal Policy.
This will be applied to all students.

W Student initiated withdrawal from class.

I Incomplete grade by PRIOR APPROVAL of the instructor. A university form must be completed and signed by BOTH the student and the instructor.

Please note: If these evaluation criteria must be revised because of extraordinary circumstances, the instructor will distribute a written amendment to the syllabus.

Student Behavior Expectations: -The instructor will respect all students and will make every effort to maintain a classroom climate that promotes learning for all students. Students must accept their responsibility for maintaining a positive classroom environment by abiding by the following rules:

1. Students are expected to arrive to class on time, remain in class until dismissed by the instructor, and refrain from preparing to leave class until it is dismissed.
2. Students are not permitted to sleep in class.
3. Student/teacher relationships, as well as relationships among peers, must be respectful at all times.
4. Students are not permitted to wear headphones or other paraphernalia that may be distracting to the classroom environment.
5. Students must refrain from any activity that will disrupt the class; this includes turning off cell phones and pagers.
6. Students are not permitted to use profanity in the classroom.
7. Students should not pass notes or carry on private conversations while class is being conducted.

Consequences for Failing to Meet Behavioral Expectations: The first time a student violates one of these rules, the instructor will warn him or her privately, either after class or before the next class. The second time a student violates the guidelines; the instructor may deduct as many as twenty points from the student's next exam grade. If a student violates the

guidelines three times, the instructor will report the student to the Dean of Students for disciplinary action according to the FSU Code of Student Conduct.

VII. Academic Support Resources:

Support resources for this course are available at the following locations:

- (1) Computer laboratories on campus including but not limited to HTC bldg;
- (2) Classrooms: SBE 218, SBE 221, SBE 224 when no class is being held there;
- (3) Chestnut Library, Student dormitories, Lyon Science Bldg New Wing room(LSA) 125.

VIII. Course Outline and Assignment Schedule

WEEK	TOPICS
1	Administrative details, introduction to Python. Demonstration of simulation programs. How to run programs in COMMAND/IDLE environments.
2, 3	Types and Operations in Python: Numbers, Strings, Lists, Dictionaries, Tuples, and Files. (Assignments #1, #2)
4, 5, 6	Assignment, Expressions, Print, Standard input/output, if Tests, while and for loops, disk input/output. Functions, Definitions and calling, Scopes and Arguments. (Assignments #3, #4)
7, 8	Describing Systems, modeling and simulations. (Assignment #5)
9, 10, 11	Dynamical systems. (Assignment #6)
12, 13, 14	Stochastic Generators.(Assignment #7)
15, 16	Spatial Distributions (Assignment #8)

- This schedule is subject to change for the optimum benefit of the class as a whole.
- Therefore it is important to stay alert and attend class regularly.

IX. Teaching Strategies

The primary teaching strategy for this course will be lecture, discussion and computer programming laboratory work.

X. Bibliography (The bibliography should be reviewed each year to ensure currency.)

- (1) B. P. Zeigler, H. Praehofer, T. G. Kim, Theory of Modeling and Simulation, 2nd Edition, Integrating Discrete Event and Continuous Complex Dynamic Systems, Academic Press, 2000
- (2) I. Aleksander and H. Morton, An Introduction to Neural Computing 2nd Edition, International Thomson Computer Press, 1995
- (3) Angela B. Shiflet and George W. Shiflet, Introduction to Computational Science, Modeling and Simulation for the Sciences, Princeton University Press, 2006
- (4) F. Neelamkavil, Computer Simulation and Modeling, John Wiley & Sons, 1987
- (5) M. H. Dunham, Data Mining, Introductory and Advanced topics, Prentice Hall, Pearson Education Inc. 2003
- (6) M. Pidd, Computer Simulation in Management Science, John Wiley & Sons, 1984
- (7) <http://www.Python.org>
- (8) <http://www.VPython.org>
- (9) <http://www.wmich.edu/ece/sever.html>