COT 3502 Computer Model Formulation (Mathematical & Numerical Methods)
Fall 2019

Instructor: Spyros A. Svoronos

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E-mail: svoronos@ufl.edu (only checked M-F)
        E-mails must include a call-back phone number.
        Without it, they may not receive a response.
Office: 264 ChE Student Center
Office Hours: MW 4:05-6:05 PM
-    In addition, I have an open door policy afternoons and evenings.

Course Objectives: - To instill ability to formulate mathematical process models.
                          - To teach analytical methods for solving the mathematical models.
                          - To teach numerical methods for solving the mathematical models.
                          - To develop the ability to write programming code.

Impact on Program Objectives:

This course will significantly contribute in achieving B.S. program objectives 1, 2, 3, 5, 6, 8, and 11   (see www.che.ufl.edu/che/undergraduate/Goals.asp)

Course Outline:

1. Models
2. Linear and nonlinear regression
3. Analytical solution of linear algebraic equations
4. Introduction to programming and Excel manipulation using Python (and some VBA)
5. Numerical solution of linear algebraic equations
6. Numerical solution of nonlinear algebraic equations
7. Analytic solution of linear ordinary differential equations using linear algebra
8. Numerical solution of linear and nonlinear ordinary differential equations

Required Text:

Automate the Boring Stuff with Python by Al Sweigart, no starch press

https://automatetheboringstuff.com/

Highly Recommended Texts:

Numerical Methods for Engineers **any edition** by Chapra & Canale, McGraw Hill
Python in Easy Steps any edition

Computer: Laptop computer running Windows and Excel is **required**

Course Assessment:
1. Two <u>evening exams</u> weighing 27.5% each and a final exam weighing 30%.
   Dates: October 3, November 14, and December 12 (3:00-5:00 PM)
2. Homework weighing 10%. Each homework problem will be graded in a scale from 0 to 3 with a 3 earned only for perfect answers.
3. Class participation weighing 5%.

Detailed Explanation of Grading:

1. For each student, Overall points are calculated as follows:

Overall Points = 0.275*Exam1Grade +0.275*Exam2Grade+
0.30*Exam3Grade+0.10*HomeworkGrade+0.05*ClassParticipationGrade

where
- Exam grades are 0-100
- HomeworkGrade = (Total homework points earned)/(maximum possible points) *100
- Class participation grade:
  - 88 if student never misses class (without excuse) and never speaks. This number is multiplied by my estimate of the fraction of times the student was present in class. Then the grade is raised according to how frequently a student answers or asks questions. Corrections of my lecture errors are especially noted. However, if a student is engaged in obvious non-class activity (reading paper, having laptops on when lecture is not involving computer, etc), that student is considered absent. If you are using your laptops for taking class notes, you are encouraged to notify me of that (I may sometimes ask you to see your notes after a class).

2. The students are sorted in the order of decreasing overall points. Grades are then decided as follows:

Division between A and A- : Largest gap between two students with 90 >= overall points > 85
Division between A- and B+ : Largest gap between two students with 85 >= overall points > 80
Division between B+ and B : Largest gap between two students with 80 >= overall points > 75
Division between B and B- : Largest gap between two students with 75 >= overall points > 70
Division between B- and C+ : Largest gap between two students with 70 >= overall points > 65
Division between C+ and C : Largest gap between two students with 65 >= overall points > 60
Division between C and C- : overall points > = 60 (no gap here, 60 is C, 59.9 C-)
Division between C- and D+ : Largest gap between two students with 50 >= overall points > 45
Division between D+ and D : Largest gap between two students with 30 >= overall points > 25
Division between D and D- : Largest gap between two students with 5 >= overall points >= 0
        (never happens)
E: Given to students for honesty violations

The class participation grade is designed so that a student who attends class regularly will not have an A grade lowered even if s/he never speaks. It helps attending students with lower overall points. Even though it is only 5%, it may have 1/3 grade point effect by moving a gap. And it may be critical in helping a student reach 60%

Other:

Do not hesitate to ask questions both in class and outside class.

ADDITIONAL INFORMATION

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu/evals. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Campus Resources:

<u>*Health and Wellness*</u>

U Matter, We Care:
If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

<u>*Academic Resources*</u>

E-learning technical suppor*t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. https://www.crc.ufl.edu/.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall*, 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*:*
https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.