

**COMPUTER MODEL FORMULATION**  
**COT 3502 | Class Number 12622 | Section 3914**  
**Class Periods:** M, W, F | Period 4 (10:40 - 11:30 AM)  
**Location:** M PSY151, W CSEE121, F PSY151  
**Academic Term:** Fall 2021

***Instructor***

Dr. Oscar D. Crisalle  
*Professor and Distinguished Teaching Scholar*  
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***Supervised-Teaching Student***

None

Office hours

TBA on the Canvas site for the course

***Grader***

TBA

***Course Description***

Solutions of scientific and engineering problems using digital computers. Formulation of models for describing physical processes, numerical analysis and computer programming.

***Course Pre-Requisites***

ECH 3023 and MAP 2302 and MAC 2313

***Course Objectives***

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

1. The students will be able to use numerical methods to find zeros of polynomials and calculate definite integrals
2. The students will be able to solve linear and algebraic equations
3. The students will be able to program in advanced languages, such as Python and MATLAB.
4. The students will be able to determine physical model parameters

5. The students will be able to use numerical methods to solve mathematical models described by differential equations.

### ***Materials and Supply Fees***

Not applicable

### ***Professional Component (ABET)***

The ABET *Student Outcomes* (SO) assessed in this course are:

1. **SO 1:** An ability to identify, formulate, and solve complex problems by applying principles of engineering, science, and mathematics. (Coverage: HIGH)
2. **SO 7:** An ability to acquire and apply new knowledge as needed, using appropriate learning strategies (Coverage: HIGH)

### ***Required Textbook***

*Numerical Methods for Engineers*, 8th Edition, by Chapra & Canale, McGraw Hill

### ***Recommended Textbook***

Python in Easy Steps. Any edition.

### ***Computer***

A laptop computer running MacOS or MS Windows.

### ***Recommended Software***

At the discretion of the instructor, this class will utilize the MATLAB and Simulink packages of TheMathworks. This software is available free of charge for students at any of the UFIT Computer Labs located on campus (<https://labs.at.ufl.edu/>). Students can also use the browser-based version of the software offered through UFApps (<https://info.apps.ufl.edu/>). A *Student Edition* or MATLAB, including Simulink is available at a discounted student price (consult the UF Bookstore).

### ***Course Topics***

1. Modeling
2. Linear and nonlinear regression
3. Introduction to programming and Excel manipulation using Python
4. Analytical solution of linear algebraic equations
5. Numerical solution of linear algebraic equations
6. Numerical solution of nonlinear algebraic equations

7. Numerical Integration
8. Numerical solution of linear and nonlinear ordinary differential equations

The list of covered topics may be changed at the sole discretion of the instructor as needed to better serve the learning needs of the class.

### ***Online Lecture Recordings***

At the discretion of the instructor, class sessions delivered via teleconference, such as using Zoom, may be audio visually recorded. Students must keep their computer cameras on during the lecture and must show their face in the camera field so the instructor can identify the class members and better communicate according to the perception of facial expressions. By keeping the cameras on, or by showing a Zoom profile image, students are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, you must contact the instructor to discuss options. If your objection stands, be sure to keep your camera off and do not use a profile image.

Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you must contact the instructor to discuss options. If your decision stands, you will need to keep your Zoom mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared.

The recording of zoom sessions without explicit instructor permission is not allowed. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

### ***Attendance Policy, Class Expectations, and Make-Up Policy***

Class attendance is required in this class. Excused absences are consistent with university policies stated in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation. Requests for make-up tests will be granted only if appropriate documentation about illness, family emergency, job interview, or UF-related travel are provided and verified by the Instructor.

### ***Evaluation of Grades***

The following is given as an example only. The instructor reserves the right to modify the policy at his sole discretion to better assess the performance of the class.

<b>Assignment</b>	<b>Total Points<sup>1</sup></b>	<b>Percentage of Final Grade</b>
Homework	100 <sup>2</sup>	15 %
Quizzes	100 <sup>2</sup>	15 %
Projects <sup>4</sup>	100 <sup>3</sup>	15 %
Midterm 1	100	15 %
Midterm 2	100	15 %
Final Exam	100	25 %
		100 %

<sup>1</sup> The total number of points earned through this component will be normalized to 100.

- 2 It is expected that each student will have the total score larger than 50 % for all homework assignments during the semester. Similarly, the total score larger than 50 % is expected for all quizzes during the semester. A failing grade will be assigned to students if the total score for all homework assignments or for the quizzes is smaller than 50%.
- 3 A total score higher than 50 % is expected in the Projects category. A failing grade will be assigned if the total score is less than 50 % or for failure to submit an acceptable project report.
- 4 Assignments labeled as "computer project" will be classified as Homework, and their grades will not be included in the Projects category.

### **Grading Policy**

The following is given as an example only. The instructor reserves the right to modify the policy at his sole discretion to better assess the performance of the class.

Percentage	Score	Letter Grade	Grade Points
90.68	- 100.00	A	4.00
87.34	- 90.67	A-	3.67
84.01	- 87.33	B+	3.33
80.68	- 84.00	B	3.00
77.34	- 80.67	B-	2.67
74.01	- 77.33	C+	2.33
70.68	- 74.00	C	2.00
67.34	- 70.67	C-	1.67
64.01	- 67.33	D+	1.33
60.68	- 64.00	D	1.00
50.68	- 60.67	D-	0.67
0.00	- 50.67	E	0.00

The Percentage-Score ranges shown above are calculated using an assumed class mean Percentage score of 80 % and a standard deviation of 10 %. The ranges may change as a function of the final statistics values at the end of the course. More information on the UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

### **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.

### ***Commitment to a Safe and Inclusive Learning Environment***

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, [rbielling@eng.ufl.edu](mailto:rbielling@eng.ufl.edu)
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, [taylor@eng.ufl.edu](mailto:taylor@eng.ufl.edu)
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, [nishida@eng.ufl.edu](mailto:nishida@eng.ufl.edu)

### ***Student Privacy***

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see:

<https://registrar.ufl.edu/ferpa.html>

### ***Health***

**If are flagged as “not cleared”** by the University, please visit the **UF Health Screen, Test & Protect** website

<https://coronavirus.ufhealth.org/screen-test-protect-2/>

to get cleared, or contact the Chemical Engineering Department advisors for assistance on how to get cleared and for any questions about your rights regarding the student clearing process.

**If you are sick.**

1. Stay home and self-quarantine, and please **immediately** visit the UF Health Screen, Test & Protect website

<https://coronavirus.ufhealth.org/screen-test-protect-2/>

about next steps, retake the questionnaire and schedule your test for no sooner than 24 hours after your symptoms began. P

2. Please also **immediately** contact your primary care provider if you are ill and need immediate care, or contact the UF Student Health Care Center at 352-392-1161 or at [covid@shcc.ufl.edu](mailto:covid@shcc.ufl.edu) to be evaluated for testing and to receive further instructions about returning to campus. Stay home and self-quarantine, and please **immediately** visit the UF Health Screen, Test & Protect website
3. Please **immediately** contact your primary care provider if you are ill and need immediate care, or contact the UF Student Health Care Center at 352-392-1161 or at [covid@shcc.ufl.edu](mailto:covid@shcc.ufl.edu) to be evaluated for testing and to receive further instructions about returning to campus. Stay home and self-quarantine, and please **immediately** visit the UF Health Screen, Test & Protect website
4. Please contact the instructor **as soon as your health condition permits it (but not sooner)**, so arrangements can be made to help you catch up or keep up with the lecture pace. Text messaging or phone calls are the fastest and most efficient ways of communication. Take all the time you need to contact the instructor, as dictated by your health condition.

### ***Campus Resources***

#### *University Health and Wellness Resources*

##### **U Matter, We Care:**

If you or a friend is in distress, please contact [umatter@ufl.edu](mailto: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/>.

#### *Academic Resources*

**E-learning technical support**, 352-392-4357 (select option 2) or e-mail to [Learning-support@ufl.edu](mailto: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](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf).

**On-Line Students Complaints:** <http://www.distance.ufl.edu/student-complaint-process>.

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