

Sara Pollock

Department of Mathematics

College of Liberal Arts and
Sciences

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MAD 4401 (S25) Syllabus

General Information

Instructor: Dr. Sara Pollock

email: s.pollock@ufl.edu,

office: LIT 444

spring 2025 office hours: posted on [home](#) page, or by appointment

(Scheduled) Class Time and Location

M W F Period 8 (3:00-3:50pm), Little Hall (LIT) 223

Required Text

Scientific Computing with MATLAB and Octave, A. Quarteroni, F. Saleri and P. Gervasio, 4th Edition. Published by Springer, 2014. tip: you can download a free and legal copy from the UF Library, or order a low-cost paperback. You need to be on-campus or connected by VPN to do this. Try this [link](#), or search for the title [here](#).

Description and Goals

Description. (Credit hours: 3), Numerical integration, nonlinear equations, linear and nonlinear systems of equations, differential equations and interpolation.

Topics.

Ch. 1: Floating point numbers

Ch. 2: Nonlinear equations

Ch. 3: Approximation of functions and data

Ch. 4: Numerical differentiation and integration

Ch. 5: Linear systems

Ch. 6: Eigenvalues and eigenvectors

Ch. 7: Optimization (time permitting)

Ch. 8: Ordinary differential equations

Ch. 9: Numerical approximation of boundary-value problems (time permitting)

Goals. Introduce the subject of numerical methods and develop hands-on experience with implementation and basic theoretical properties of these methods.

Prerequisites. MAS 3114 or MAS 4105, with a minimum grade of C and experience with a scientific programming language.

Grading Policy

Grades will be calculated according to the following percentages ('+' and '-' may be assigned at upper and lower 2-point ranges of each grade):

Midterm	14%	90%-100%	A
Homework (& Quizzes)	41%	80-89%	B
Final Exam	25%	70-79%	C
Class participation	20%	60-69%	D
		<60%	F
Total	100%		

Class Participation. The class participation grade is broken down as follows.

15% In-class activities: They will be graded for a combination of participation, completeness and correctness.

5% General participation: (1) Showing up to class on time on a regular basis and attending the entire class. (2) Asking for clarification if you do not understand a concept or assignment. (3) Maintaining the appearance that you are paying attention in class. At the end of the semester you will have the opportunity to tell me what your general participation grade should be, based on these criteria.

Homework. Problem sets will be assigned regularly. You are welcome to discuss problems with each other, our grader, and/or with me; but, the solutions you turn in must be your own. Any code turned in must be your own or modified from presented examples or in-class work. You are discouraged from searching the internet or asking a chatbot/LLM for solutions without first thinking through the problem on your own. If you do refer to an outside source, you should cite that source. Wikipedia, blogs and tutorial websites are not valid sources. If you do refer to an outside source, you should cite that source. Wikipedia, blogs and tutorial websites are not valid sources. Source codes from the textbook or that I give you in class **are** valid sources. If you do consult a chatbot, you should clearly state that, and append the entire chatbot conversation to your assignment. If you use NaviGator Chat ([https://it.ufl.edu/ai/navigator-chat/ Links to an external site.](https://it.ufl.edu/ai/navigator-chat/Links%20to%20an%20external%20site/)), you can either export or generate a shareable link to the chat. Homework guidelines will be posted on the class Canvas page.

Some problems will include writing basic matlab or python code. In some cases I may ask you to submit the code (by Canvas) so that I may run it. Not all problems will be graded on all homeworks; homework grades will be assigned based on a combination of completeness (attempting all problems), and on your solutions to those explicitly graded.

Late homework: Homework will be assigned and turned in via Canvas. Late homeworks will lose 5% of total possible points for each full hour they are late. If I am informed of a

valid reason why an assignment is late (or going to be late), such as an internet or Canvas failure, then this penalty will not apply.

Quizzes. If there are any quizzes, they will be announced in advance. Each quiz will count the same as a homework.

Exams. There will be two exams: a midterm and a final. Each exam will include a written component. Exams may also have a take-home component which may involve producing running code. This work is expected to be your own, and you will receive a zero on the entire exam if it is not. Exam dates will be posted.

Take-home (components of) exams will lose 10% of total possible points for each full hour they are late. If I am informed of a valid reason why an exam is late (or going to be late), such as an internet or Canvas failure, then I will update the deadline accordingly.

Class Policies

Symbolic Math. The focus of the class is on the basic computational algorithms in floating-point arithmetic used in scientific computation. Generally, you may not use the symbolic math toolbox (or use matlab commands including “sym”, “syms,” “symfun,” “symsum,” “symprod,” etc.) on any homework or exam question. We may use it on occasion for comparison.

Attendance. It is in your best interest to attend lectures.

Computers. You will be expected to bring a laptop for in-class programming activities. There may be times a computer is necessary for the homework and take-home exams, as required. It is suggested that you program in Matlab or Octave. We may also use Python.

Cell phones. Please don't use your cell phone during class. Phones and all electronic devices should be turned off during exams.

Excused absences. Make-up exam/quiz work is allowed only when written evidence of an official University excused absence is provided. Notification in writing (acknowledged email is acceptable) prior to the date of the absence, or as soon as possible thereafter, is required. If these conditions are met and the solutions are not yet posted, the student may take the quiz/exam. If the solutions are already posted, the student may take an alternate quiz/exam, although no guarantee can be made that the alternate quiz/exam is no more challenging than the original.

Academic Integrity

Honor Code. 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 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. You can find the honor code here: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/> If you have any questions or concerns, please consult with the instructor.

I take academic integrity very seriously. If a homework solution or take-home portion of an exam you turn in is not your own work as outlined above, you will receive a zero on that assignment. If multiple assignments are found not to be your own work, you will receive an F in the class.

SUGGESTION. Seek outside help on a problem only after thinking about it for at least 40 minutes.

Additional UF Policy Information

UF Policy on Grade Points. Grading will be in accord with the UF policy stated here: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Class Attendance. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found here: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Accommodations for Students with Disabilities. 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.

U Matter We Care. Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392- 1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Contact information for the Counseling and Wellness Center.

<https://counseling.ufl.edu/>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Online Evaluations. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/> . Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/> .

Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

Diversity, Equity and Inclusion Statement. The Mathematics Department is committed to diversity and inclusion of all students. We acknowledge, respect, and value the diverse nature, background and perspective of students and believe that it furthers academic achievements.

It is our intent to present materials and activities that are respectful of diversity: race, color, creed, gender, gender identity, sexual orientation, age, religious status, national origin, ethnicity, disability, socioeconomic status, and any other distinguishing qualities.

UF Policy on In-Class Recording: Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

UF Policy on Religious Holidays: can be found here:

<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/#religiousholidaystext>.

We will follow these guidelines. If there is a conflict between an class assignment or activity and a religious holiday, students are encouraged to let the instructor know as far in advance as possible. If it may include multiple students, whether or not multiple students informed the instructor, accommodations may be made for the entire class.

THIS SYLLABUS IS SUBJECT TO CHANGE.

