

Home

Research &  
Students

Publications

Curriculum Vitae

Courses

Editorial/calls for  
papersNumerical Analysis  
Research GroupSeminar on Applied  
and Numerical  
Analysis (ANA)Department of  
Mathematics

AWM@UF

Finite Element  
Circus@UF

Links

## MAP 6375 (F23) Syllabus

### Course: Numerical Partial Differential Equations General Information

Instructor: Dr. Sara Pollock

email: [s.pollock@ufl.edu](mailto:s.pollock@ufl.edu),

office: LIT 444

Fall 2023 office hours: Wednesday, Period 6 (12:50-1:40), or by appointment. *Please request an appointment by email if you are not available during regular office hours.*

### Class Time and Location

M W F Period 8 (3:00-3:50p), Little Hall Room 221.

### Required Text:

*Introduction to Automated Modeling with FEniCS*, L. R. Scott. Available on Amazon (either full or student edition is fine). Additionally, a pdf of the book will be made available to students.

### Also required:

Install FEniCS on some computer that you have regular access to. Download it [here](#). Different versions are available for Linux, Mac and Windows.

### Suggested Text:

*Partial Differential Equations with Numerical Methods*, S. Larsson and V. Thomée, Springer, 2003.

### Description and Goals

**Description.** (Credit hours: 3), Introduction to partial differential equations and fundamental concepts of modeling elliptic, parabolic, and hyperbolic equations. Emphasis will be placed on finite element simulations. Students will have the opportunity to explore select topics in greater depth.

### Topics.

- Variational formulations
- Variational approximations
- Boundary conditions and nonconvex domains
- Boundary layers
- Laplace/Poisson, heat, and wave equations
- As time/interest allows: Stokes equation, plus additional topics

**Goals.** Understand the mathematical framework of basic numerical approximation techniques used for modeling classical physical phenomena. Understand how these techniques can extend to more realistic problems, and where additional challenges arise.

**Prerequisites.** MAD 6406-6407 or consent of the instructor

## Grading Policy

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

Homework	25%	90%-100%	A
Final Project	25%	80-89%	B
Class Participation	50%	70-79%	C
		60-69%	D
		<60%	F
Total	100%		

**Class Participation.** Your participation grade will be determined by the following factors. (1) Showing up to class on time on a regular basis and attending the entire class, however: *missing class when you are not feeling well, or think you may be contagious to others, will not affect your grade*; (2) Asking for clarification if you do not understand a concept or assignment. (3) Maintaining the appearance that you are paying attention in class, and avoiding distracting others; (4) Demonstrating that you can run the example codes. You will have the opportunity to rate your own class participation at the end of the semester.

**Homework.** Problem sets will be assigned. You may work with a partner on homework: one student should turn it in through Canvas, and both students will receive the same grade; however, you may not work with the same partner two weeks in a row. You are always welcome to discuss problems with each other 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. You are discouraged from searching the internet or asking a chatbot for solutions. If you do refer to an outside source, you should cite that source. Wikipedia, blogs and tutorial websites are not valid sources.

Some problems will include numerical examples using FEniCS.

**Exams.** There will be no exams.

**Projects.** Projects will explore some of the more advanced topics not covered in lectures. Students may work with a partner on projects; both students will receive the same grade.

## Class Policies

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

**Computers.** You will need to use one.

**Cell phones.** Please don't use your cell phone during class.

**Make-up/late work.** Make-up exam 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 is required. In cases where this is not feasible, the student must provide documentation by the end of the second working day after the absence. If these conditions are met, then the percentage grade earned on the final exam will be substituted for a missed exam.

## 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](mailto: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/> .

