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Courses

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MAT 6932 Finite  
Difference  
Methods for

# MAT 6932 Finite Difference Methods for PDEs

## Basic Information

**Instructor:** Maia Martcheva

**Office:** 469 Little Hall

**E-mail:** maia@ufl.edu

**Course Meetings:** MWF 3:00-3:50 (Period 8) LIT 205

**Office Hours:** MW 12:50-1:40 (Period 6) or by appointment

NOTE: If you want to register this class, you have to talk to Margaret Somers.

## Goal:

To develop basic knowledge in numerical methods for Ordinary and Partial Differential Equations. The main type of numerical methods that will be discussed are Finite Difference Methods.

## Basic Topics

1. Numerical Methods for ODEs. Euler's Method, Taylor's methods, Runge-Kutta Methods.
2. Very basic introduction to PDEs,
3. Numerical methods for elliptic equations.
4. Numerical methods for hyperbolic equations.
5. Numerical methods for parabolic equations.
6. Stability, consistency, convergence. (if time permits)

## Prerequisites:

PDEs
Curriculum Vitae
Publications
Research

Some ODEs/PDEs. Introductory Numerical Analysis class (MAD 4401 or better).

## Requirements:

1. Project: Find a PDE equation from your area of expertise/interests. Develop a finite difference method for the PDE equation. Code it (in MATLAB). Students will be expected to make presentations on their projects and/or project results. Alternatively, students may present a paper.
2. Students are expected to attend class.
3. Having access to MATLAB might help you learn more in this class.

## Grading:

Grades will be based on (1) Attendance; (2) Projects/Presentations.

## Syllabus

## Special Accommodations:

Students requesting classroom accommodations or special arrangements during examinations must first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc](http://www.dso.ufl.edu/drc)). The DRC will provide documentation. The student must then present this documentation to instructor to meet the requesting accommodation. This should be done as early in the semester as possible.

## Academic Honesty:

Students are expected to know and follow the [Code of Student Conduct](#). In particular, students must refrain from cheating,

not make their work available for cheating, give due credit and citation for any quoted work, and make only fair use of copyrighted materials and software. You are expected to write exams and complete computer projects on your own. The university has a policy on academic honesty, which may be found in the University of Florida Rules, 6C1-4, dealing with Student Affairs. In contrast to the exams and computer projects, you are allowed to work with others on homework problems—including the ones to be handed in.

## 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.

### Course Evaluation:

Students are invited to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. 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/>

