

# SPRING 2019

## SYLLABUS

<i>Course title</i>	<b>Intro to Numerical Analysis</b>
<i>Course number</i>	MAD 4401
<i>Schedule, Room</i>	<b>MWF 8</b> , Lit 219
<i>Instructor</i>	Maia Martcheva maia@ufl.edu <a href="http://people.clas.ufl.edu/maia/">http://people.clas.ufl.edu/maia/</a>
<i>Office hours</i>	WF 3rd period or by appointment
<i>Office</i>	Little Hall 469

*Goals:* To introduce students to basic numerical methods for approximate solution of equations, approximate numerical differentiation and integration, approximate solution of ordinary differential equations and interpolation of data.

*Required Textbook:* R. Burden, D. Faires, A. Burden, Numerical analysis, 10 E, Cengage Learning, US, 2016.

### *Topics:*

- (1) Solutions of equations of one variable
- (2) Interpolation and polynomial approximation
- (3) Numerical differentiation and integration
- (4) Initial-value problems for ODEs
- (5) Direct methods for linear systems

*Prerequisites:* MAS 3114 (or MAS 4105). Access to and some familiarity with Matlab will be necessary.

### **Requirements:**

- (1) There will be 2 tests
  - Midterm – **March 13, 2019, in class.**
  - Final – **April 24, 2019, in class.**
- (2) There will be frequent open-notes in-class quizzes.
- (3) Students will be expected to attend class.
- (4) A good calculator (TI 83 or better) will be necessary.
- (5) We will use Matlab for computation. Having access to the software will be necessary and useful.

*Expected Student Learning Outcomes:* At the end of this course, students will be expected to have achieved the learning outcomes in content, problem solving and critical thinking:

Content: Students demonstrate elementary competence in the terminology, concepts, and methodologies used within the discipline. Students will acquire a basic knowledge in solving approximately one dimensional non-linear equations, interpolating data, approximate methods for differentiation and integration and solving ODEs. Students will learn to analyze and use computation to approximate the error of the methods. At the

end of the class students are expected to know how to formulate numerical methods and estimate the error of the approximation.

**Problem solving:** Students will work on open-book/notes in class quizzes and solve problems on their own. Practice exams for the midterm and final will be available for students to review and prepare for the exam. Working in teams on these practice exams is allowed. Student outcome of this learning tool will be evaluated at the Midterm and Final.

**Critical Thinking:** Students analyze information carefully and logically from multiple perspectives, using discipline-specific methods. Students will grade each others' quizzes and provide feedback to peers as well as interpret others' criticism of their work. Achievement of this learning outcome will be assessed by collecting and grading students' quizzes.

*Grading:* Grades will be based on (1) Tests; (2) Quizzes;

- Midterm – 100 points
  - Final – 100 points
  - Quizzes – 100 points
- 
- Total: 300 points

Additional grading policies:

- (1) Class letter grades are based on a curve. Approximate minimal cutoffs are:
  - A – 270 points or higher
  - B – 240 points or higher
  - C – 210 points or higher
  - D – 180 points or higher
- (2) 5 quizzes will be graded by the instructor for a total of 100 points. All quizzes will be graded by classmates.
- (3) In case of planned absence of a test, you may take the test beforehand. In case of an emergency, if a test is missed, a make up may be approved and administered within one week of the regular exam.

*Special Accommodations:*

Students requesting classroom accommodations or special arrangements during examinations must first register with the Disability Resource Center

<https://disability.ufl.edu/>

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 take exams and quizzes on your own and complete the project within your team. The university has a policy on academic honesty, which should be followed.

*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) (or see <http://www.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/>