

MAD 4401 (3215) Introduction to Numerical Analysis

Fall 2015

<http://people.clas.ufl.edu/kees/files/MAD4401Fall2015.jpg>

Instructor: James Keesling (352)294-2312
LIT 424
kees@ufl.edu

Office Hours: MW 3rd Period

Meeting Time and Place: MWF 5th Period, 11:45-12:35
LIT 219

Textbook: No textbook assigned. A **TI-Nspire CX CAS** calculator is required. The manual can be found at <http://education.ti.com/en/us/guidebook/search/ti-nspire>.

Goal: The student should become familiar with the techniques of numerical analysis and be able to solve various types of mathematical problems using the techniques.

Syllabus: This course is an introduction to the basic techniques of numerical analysis. A major theme in the course will be analysis of error. This is a course in mathematics. So, attention will be paid to the mathematical theory behind the methods used.

No textbook is required. Class notes will be available online. The TI-Nspire CX CAS will be used in class to investigate examples to clarify the theory. It will also be required for the tests. The tests and final will include examples to be calculated and explained.

Topics to be covered will include: the Bisection Method of Solving Equations, Newton-Raphson Method of Solving Equations, Lagrange polynomial Interpolation, Newton-Cotes Quadrature, Gaussian Quadrature, Romberg Quadrature, Taylor Method of Solving Differential Equations, Runge-Kutta Method of Solving Differential Equations, Adaptive Step-Size Solutions of Differential Equations, Richardson extrapolation, Queueing Theory and Simulation, and Monte-Carlo Integration.

Week 1	Solving equations
Week 2-3	Polynomial approximation
Week 4-7	Estimating integrals
Week 8-9	Estimating derivatives
Week 10-12	Numerical solution of differential equations
Week 13-15	Queueing and stochastic simulation
Week 16	Review

Tests and Grading: There will be two in-class tests and a final exam. The grades will be determined by averaging the tests and final exam scores: 95-100 = A, 90-94 = A-, 87-89 = B+, 83-86 = B, 80-82 = B-, 76-79 = C+, 70-75 = C, 65-69 = D+, 60-64 = D, 0-59 = E.

Final Exam: Friday, Dec 18, 12:30-2:30 pm, LIT 219

Policy for Make-Up Exams: If a student has a known conflict for an exam, the student has the responsibility to make arrangements for a make-up before the exam is given. If a student misses an exam due to an emergency, arrangements must be made as soon as possible for a make-up.

Students with Disabilities: Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, 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.