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MAT 683    Methods of Numerical Analysis I
       A. Lutoborski,   Syracuse University
                   Fall 2017.
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Classes : Tuesday, Thursday, 12:30-1:50, Carnegie Room 109.

Instructor : Professor Adam Lutoborski, Department of Mathematics, 213 B Carnegie, phone 443-1489, e-mail `alutobor@syr.edu`

Office Hours : Monday 11:00-12:00, Wednesday 1:00-2:00.

Text : "Numerical Analysis. Mathematics of Scientific Computing" by D. Kincaid and W. Cheney, Brooks-Cole, 3rd Edn.

Prerequisites : MAT 512. MATLAB will be used in some of our homework problems.

Exams, Homeworks, Final Exam: There will be two exams and a cumulative final exam given in this course. Exam 1 will be given after chapters 1,2,6 are covered and Exam 2 after Chapter 7 is covered. Precise date will be annnounced in class. Homework will be given every week; selected problems will be graded. Dates of the exams will be announced approximately a week before the exam. Final Exam: Wednesday December 13, 5:15-7:15 pm.

Course Grades: Course grades will be determined by: homework= 35%, 2 exams= 40%, final exam= 25%.

Course Description: This is an introductory graduate course in numerical analysis. We cover: computer arithmetic, interpolation and approximation of functions, numerical differentiation and integration, solution of nonlinear equations. The course material will be selected from chapters 1,2,6,7,3 (in that order) of the text.

Course Content

1. Basic concepts in numerical analysis

    1.1 Mathematical preliminaries

    1.2 Floating point arithmetic

    1.3 Sensitivity analysis

2. Approximation of functions

    2.1 Polynomial interpolation

    2.2 Hermite interpolation

    2.3 Spline interpolation

    2.4 Trigonometric interpolation

    2.5 Least squares approximation

3. Numerical integration

    3.1 Interpolatory quadratures

    3.2 Composite quadratures

    3.3 Gaussian quadratures

4. Solution of nonlinear equations

Disability-Related Accomodations: Students who are in need of disability-related academic accommodations must register with the Office of Disability Services (ODS), 804 University Avenue, Room 309, 315-443-4498. Students with authorized disability-related accommodations should provide a current Accommodation Authorization Letter from ODS to the instructor and review those accommodations with the instructor. Accommodations, such as exam administration, are not provided retroactively; therefore, planning for accommodations as early as possible is necessary. For further information, see the ODS website, Office of Disability Services http://disabilityservices.syr.edu/

Academic Integrity: Syracuse University's Academic Integrity Policy reflects the high value that we, as a university community, place on honesty in academic work. The policy defines our expectations for academic honesty and holds students accountable for the integrity of all work they submit. Students should understand that it is their responsibility to learn about course-specific expectations, as well as about university-wide academic integrity expectations. The policy governs appropriate citation and use of sources, the integrity of work submitted in exams and assignments, and the veracity of signatures on attendance sheets and other verification of participation in class activities. The policy also prohibits students from submitting the same work in more than one class without receiving written authorization in advance from both instructors. Under the policy, students found in violation are subject to grade sanctions determined by the course instructor and non-grade sanctions determined by the School or College where the course is offered as described in the Violation and Sanction Classification Rubric. SU students are required to read an online summary of the University's academic integrity expectations and provide an electronic signature agreeing to abide by them twice a year during pre-term check-in on MySlice.

The Violation and Sanction Classification Rubric establishes recommended guidelines for the determination of grade penalties by faculty and instructors, while also giving them discretion to select the grade penalty they believe most suitable, including course failure, regardless of violation level. Any established violation in this course may result in course failure regardless of violation level. For more information and the complete policy, see http://class.syr.edu/academic-integrity/

Religious observances policy: SU religious observances policy recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes. For fall and spring semesters, an online notification process is available through MySlice (Student Services Enrollment My Religious Observances) from the first day of class until the end of the second week of class.