MAT 683   Methods of Numerical Analysis I
A. Lutoborski,   Syracuse University
Fall 2016.

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 : Tuesday, Thursday 11:00-12:00, Wednesday 3:00-4:00.

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 14, 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, 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: The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the Policy and know that it is their responsibility to learn about instructor and general academic expectations with regard to proper citation of sources in written work. The policy also governs the integrity of work submitted in exams and assignments as well as the veracity of signatures on attendance sheets and other verifications of participation in class activities. Serious sanctions can result from academic dishonesty of any sort. For more information and the complete policy, see http://academicintegrity.syr.edu

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 are 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 $\rightarrow$ Enrollment $\rightarrow$ My Religious Observances) from the first day of class until the end of the second week of class.