MAT 423 - Numerical Analysis I

Instructor: Z. Jackiewicz, GWC 644
Class location and time: WXLR A 106, MW 10:45AM-12:00PM
Office hours: GWC 644, MWF 9:30AM-10:30AM
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Solution of systems of linear and nonlinear equations, optimization, eigenvalues, round-off error, and floating point arithmetic. Fluency in computer programming (Matlab) is required for enrollment in this course. Some of the topics include:

- Rootfinding for nonlinear equations: the bisection method, Newton’s method, the secant method, a general theory of one-point iteration methods, systems of nonlinear equations, Newton’s method for nonlinear systems, unconstrained optimization.

- Linear systems: permutation and triangular matrices, Gaussian elimination, LU factorization, pivoting, vector and matrix norms, error analysis and conditioning, positive definite matrices, Cholesky factorization, Matlab linear algebra tools.

- Least squares problems: curve fitting, Householder reflections and Givens rotations, QR factorization, pseudoinverse, rank deficiency, error analysis, Matlab least squares tools.

- Eigenvalues and singular values: eigenvalue and singular value decompositions, eigenvalue and singular value sensitivity and accuracy, Jordan and Schur canonical forms, the QR algorithm, principal components and approximation of matrices, applications, Matlab tools.

Textbook:

Supplementary Texts:


Attendance:

Attendance is mandatory! Your instructor reserves the right to take attendance and to incorporate your attendance as part of your overall grade. For classes that meet two days a week, the maximum number of absences is four. For classes that meet three days a week, the maximum number of absences is six. Students who exceed the number of allowed absences will receive a grade of EN. Your instructor reserves the right to take attendance and to incorporate your attendance as part of your overall grade.

Classroom behavior, etiquette and academic integrity policies:

Athletes with travel schedules should meet with the instructor by the end of the first week of classes to discuss any necessary arrangements that need to be made. If you have a disability that requires special accommodations, it is your responsibility to bring this to your instructor’s attention during the first week of class. You must also contact the ASU Disability Resource Center https://eoss.asu.edu/drc. All efforts will be made to ensure you have equal opportunity to succeed in the course, but there can be no retroactive accommodation. Arrangements for any religious observances or ASU sanctioned activity must be arranged with the instructor at least one week prior to the event. Classroom disturbances, including but not limited to: arriving late, talking in class, using cellular devices, texting, listening to music, eating and drinking are not tolerated. Each student is expected to show respect for every student registered in the course. Turn off any cellular phones, pagers, laptops, tablets and other electronic devices and put them out of sight prior to entering class. The usage of laptops is prohibited in the classroom. Notes should
be taken with pen/pencil on paper. If you wish to use an electronic device for note taking, talk to your instructor. An instructor may withdraw a student from a course when the student’s behavior disrupts the educational process under USI 201-10 http:www.asu.edu/aad/manuals/usi/usi201-10.html Students are required to adhere to the ABOR Student Code of Conduct: https://eoss.asu.edu/dos/srr/codeofconduct.

**Academic Integrity:**

Academic honesty is expected of all students in all examinations, papers, laboratory work, academic transactions and records. The possible sanctions include, but are not limited to, appropriate grade penalties, course failure (indicated on the transcript as a grade of E), course failure due to academic dishonesty (indicated on the transcript as a grade of XE), loss of registration privileges, disqualification and dismissal. For more information, see http://provost.asu.edu/academicintegrity. The grade of XE: A grade of XE is reserved for ”failure due to academic dishonesty.” The grade goes on the student’s transcript and usually remains there permanently. Examples of academic dishonesty are signing an attendance sheet for another student or asking another student to sign an attendance sheet on your behalf, accessing unauthorized help while taking an exam, and attempting to influence a grade for reasons unrelated to academic achievement. Asking for a higher grade than the one you have earned because you need a higher grade to maintain a scholarship, or to satisfy your own or someone else’s expectations constitutes academic dishonesty.

**Course Withdrawal Deadline:**

November 6, 2019.

**Complete Withdrawal Deadline:**

December 6, 2019.

**Withdrawal:**

A student may withdraw from a course with a grade of W during the withdrawal period. The instructor’s signature is not required. A complete withdrawal must be done in person and that it involves withdrawing from all ASU classes, not just Math 266. Students will not be withdrawn if they merely stop coming to class. It is a student’s responsibility to verify whether they have in fact withdrawn from a class.
The grade of Incomplete:
A grade of incomplete will be awarded only in the event that a documented emergency or illness prevents the student who is doing acceptable work from completing a small percentage of the course requirements. The guidelines in the current general ASU catalog regarding a grade of incomplete will be strictly followed. Instructor-Initiated Drop: At the instructor’s discretion, a student who has not attended any class during the first week of classes may be administratively dropped from the course. However, students should be aware that non-attendance will NOT automatically result in their being dropped from the course. Thus, a student should not assume they are no longer registered for a course simply because they did not attend class during the first week. It is the student’s responsibility to be aware of their registration status.

Final Exam Make-up Policy:
The final exam schedule listed in the Schedule of Classes will be strictly followed. Except to resolve those situations described below, no changes may be made in this schedule without prior approval of the Dean of the College of Liberal Arts and Sciences. Under this schedule, if a conflict occurs, or a student has more than three exams on one day, the instructors may be consulted about an individual schedule adjustment. If necessary, the matter may be pursued further with the appropriate dean(s). This procedure applies to conflicts among any combination of Downtown Phoenix campus, Tempe campus, Polytechnic campus, West campus, and/or off campus class. Make-up exams will NOT be given for reasons of a non-refundable airline tickets, vacation plans, work schedules, weddings, family reunions, and other such activities. Students should consult the final exam schedule before making end-of-semester travel plans.

Disability Accommodations:
If you have a disability that needs accommodating, please report this privately to the instructor by the end of the first week of class. You should also contact the Disability Resource Center at (480) 965 – 1234 (voice) or (480) 965 – 9000 (TTY). All efforts will be made to ensure you have equal opportunity to succeed in the course.

Note:
This syllabus is tentative and should not be considered definitive. The
instructor reserves the right to modify it (including the dates of the tests) to meet the needs of the class. It is the student responsibility to attend class regularly and to make note of any change. The Instructor also reserves the right to create class policies in regards to homework due date, late assignments.