MAT 532
Applied Linear Algebra
Fall 2017
Sean Rostami

Contact

This course meets MWF from 10:35 AM to 11:30 AM in 120 Carnegie Building. Sadly, there is no Recitation for MAT 532. My Office Hours are W from 8:25 AM to 9:20 AM, R from 9:30 AM to 10:50 AM, and F from 11:40 AM to 12:35 PM. *These times are deliberately non-uniform, to increase the chance that every student can visit at least once per week.* If you cannot attend any of these, contact me for a special appointment. My email is sjrostam@syr.edu, and my office is 313C Carnegie Building.

Logistics

I will use Blackboard to host documents and communicate. Be sure that you can operate Blackboard and that you can send/receive email via your @syr.edu address. If you have trouble with either of these things, please feel free to visit me for help. Y*ou are expected to check email and Blackboard at least once per day.*

Content

The textbook for this course is *Applied Linear Algebra* by Peter Olver and Chehrzad Shakiban. We will cover most, but not all, of each of the following chapters: from Chapter 1 up to and including Chapter 5, Chapter 8, and Chapter 10. I hope there will be time also to do Linear Programming. *Linear Programming is not represented in this particular book, but I will provide some materials if and when the time comes.* The overall pattern is to "pair" a review of prerequisite material with genuinely new topics. For example, Singular Value Decomposition and Power Method will follow a review of eigenvalues and diagonalization.

Coursework

Homework will be assigned after most lectures, and due the following lecture. A short quiz will occur in most lectures. The topic of the quiz can be anything up to and including the previous lecture, although obvious sources of questions for the quiz are the previous lecture and the previous homework. All exams will be "in class", without books/notes.

Technology

Real-world Linear Algebra is done with the aid of a computer, but no amount of computation is useful if you don't understand the theory. To emphasize this, we will sometimes employ a computer for mechanical but time-consuming procedures and focus more on (a) clear mathematical statements of questions, (b) how to interpret the computer's results. In other words, we focus more on the beginning and end of a problem than the middle. In a perfect world, we would all use MATLAB for this. To avoid the overhead required for this, while still retaining the spirit, we will instead use a Graphing Calculator. You may be surprised to learn that most graphing calculators can perform some of the key operations from Linear Algebra. Many of you already own such a calculator, but the Carnegie Library has dozens of such calculators available to borrow. You will need these for some homework, some quizzes, and some exams. I will occasionally use MATLAB to illustrate something that would otherwise be impractical.

Scoring

Categories of work, and their relative weights, are:
- Homework (≈ Daily)   10%
- Quiz (≈ Daily)   15%
- Imperatives   5%
- Midterm 1 (≈ Oct 13)   20%
- Midterm 2 (≈ Nov 17)   20%
- Final Exam (Cumulative, Dec 11)   30%

The Final Exam will occur from 3:00 PM to 5:00 PM on Dec 11. The location of the Final Exam is not yet known. The "Imperatives" category will be explained by me on the first day. The assignment of letter grades to scores will largely follow the usual Syracuse University standard.

Advice

It is important that you complete the homework with minimal assistance. "Assistance" includes solution manuals, the internet, tutors, friends, and the textbook (if used to copy examples). It is difficult, but necessary, to resist these opportunities. In reality, you rarely see mathematics exactly as you see it in a course like this – otherwise, "WolframAlpha user" would be the only job. Instead, you must adjust and transport ideas to new situations. The only way to do this, a delicate and subtle business, is to understand every detail of our version. The only reliable way to know every detail is to struggle through it.

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 failure regardless of violation level. For more information and the complete policy, see http://class.syr.edu/academic-integrity/.

Religion

The Religious Observance Policy protects the rights of students, faculty, and staff to observe religious holy days according to their tradition. Under the policy, students are provided an opportunity to make-up any coursework missed due to religious observance, provided that they notify instructors of such before the end of the second week of class. This notification may also be accomplished online, via mySlice. More information is available at http://supolicies.syr.edu/studs/religious_observance.htm.

Disabilities

The Office of Disabilities Services (ODS) should be contacted by any student who may need academic accommodations. Upon registration at ODS, documents will be issued which should be provided to instructors. It is also encouraged to discuss such needs with the instructor at the beginning of the semester. Such accommodations and services are not provided retroactively, so it is important to contact ODS as soon as possible. More information is available at http://disabilityservices.syr.edu.