AMS 210 Applied Linear Algebra

INSTRUCTOR: Suil O
Assistant Professor, Department of Applied Math & Statistics
CLASS: Mon, Wed 5:00-6:20 pm, Room: A114
OFFICE: Academic Building B523
OFFICE HOUR: Tue 10:00 - noon, 3:00 - 5:00 pm or by appointment
PHONE: 632-626-1913
E-MAIL: suil.o@stonybrook.edu
WEB SITE: http://www.ams.sunysb.edu/~suilo

TA: Sinye Noh
OFFICE: Academic Building B517
E-MAIL: Sinye.noh@stonybrook.edu
OFFICE HOUR: Mon, Wed 3:40 - 4:40 pm


Chapters to be Covered: We will cover portions of Chapters 1 through 5 (skip chapter 4).

Homework: Assignments will be given on a weekly basis. Each homework is due the following week at the beginning of lecture. No late homework will be accepted. The lowest two homework scores will be dropped before computing the average.

Tests
Exam I: Mon, April 3, in class
Exam II: Wed, May 10, in class
Final: Wed, June 21, 12:30 pm - 3:00 pm

Grading of Tests and Homework
Grading will be based on the following:
Homework (10%), Midterms (25% × 2 = 50%), and Final exam (40%)
Any trend in your progress will also be taken into account.
Learning Outcomes

1. Become familiar with a diverse set of linear models and use them to interpret theory and techniques throughout the course:
   - a system of 3 linear equations in 3 unknowns;
   - a Markov chain model;
   - a dynamic (iterative) linear systems of equations;
   - a general equilibrium model.

2. Compute and apply basic vector-matrix operations:
   - scalar products;
   - matrix-vector products;
   - matrix multiplication.

3. Demonstrate diverse uses of scalar and vector measures of a matrix:
   - matrix norms;
   - dominant eigenvalue and dominant eigenvector.

4. Solve a system of linear equations using:
   - Gaussian elimination;
   - determinants;
   - matrix inverses;
   - iterative methods,
   - least squared approximate solutions using pseudo-inverses.

5. Demonstrate how Gaussian elimination determines if a system of linear equations is:
   - overdetermined;
   - underdetermined and how to determine the family of solutions;
   - uniquely determined and find the solution.

6. Apply basic ideas of numerical linear algebra:
   - computational complexity of matrix operations;
   - LU decomposition;
   - using partitioning to simplify matrix operations;
   - ill-conditioned matrices and the condition number of a matrix.

7. Learn and use basic theory about the vector spaces associated with a linear transformation:
   - linear independence;
   - the null space;
   - the range space;
   - orthonormal spaces.

8. Examine a sampling of linear models, chosen from linear regression, computer graphics, markov chains, and linear programming.

9. Strengthen ability in communicating and translating of mathematical concepts, models to real world settings:
• present solutions to problems in a clear, well-laid out fashion;
• explain key concepts from the class in written English;
• convert problems described in written English into an appropriate mathematical form;
• convert the mathematical solutions into a written answer.
Academic Integrity
Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person’s work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary/

Americans With Disabilities Act
If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Academic Affairs. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Critical Incident Management
Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students’ ability to learn.

Course Evaluations
Stony Brook University values student feedback in maintaining the high quality education it provides and is committed to the course evaluation process, which includes a mid-semester assessment as well as an end-of-the-semester assessment, giving students a chance to provide information and feedback to an instructor which allows for development and improvement of courses. Please click the the following link to access the course evaluation system: http://stonybrook.campuslabs.com/courseval/

Attendance Policy
(1) All students of SUNY Korea are required to attend every class.
(2) Unexcused absences will affect seriously the students final grade in the course.
(3) If a student has over 20% unexcused absence, the students final course grade will be an F.

   Example
   i) If the class is a 150 minute class, and is held once a week, the 4th unexcused absence of a student will lead to an F grade of the course.
   ii) If the class is a 75 minute class, and is held twice a week, the 7th unexcused absence of a student will lead to an F grade of the course.
   iii) If the class is a 50 minute class, and is held three times a week, the 10th unexcused absence of a student will lead to an F grade of the course.
   iv) In Intensive English Course (IEC), if a student misses the class more than 40 hours in a semester, the student will receive an F grade on the course.

(4) Students should report the reason of absence to the instructor in advance, or immediately after the absence.

(5) When a student excuses his/her absence, the student must provide documentation of the reason for the absence to the instructor.

(6) The instructor of the course reserves the right to excuse absences.

(7) The course instructor may excuse the absence if the submitted documentation fulfills the conditions below.

   i) Extreme emergencies (e.g. death in the family)
   ii) Severe medical reasons with doctors note (Not a slight illness)
   iii) Very important events (e.g. national conference, official school event)

(8) At the end of semester, the course instructor should submit a copy of the attendance sheet to the Academic Affairs Office.
## Tentative course schedule

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