MATH 551: Applied Matrix Theory

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### The Instructors

<table>
<thead>
<tr>
<th>Instructors</th>
<th>Rina Anno</th>
<th>Pietro Poggi-Corradini</th>
<th>Bacim Alali</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td><a href="mailto:ranno@ksu.edu">ranno@ksu.edu</a></td>
<td><a href="mailto:pietro@ksu.edu">pietro@ksu.edu</a></td>
<td><a href="mailto:bacimalali@ksu.edu">bacimalali@ksu.edu</a></td>
</tr>
<tr>
<td>Lecture</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>Ref n.</td>
<td>11980</td>
<td>11979</td>
<td>13675</td>
</tr>
<tr>
<td>Time</td>
<td>MW 10:30am</td>
<td>MW 1:30pm</td>
<td>MW 2:30pm</td>
</tr>
<tr>
<td>Room</td>
<td>CW 102</td>
<td>CW 102</td>
<td>CW 146</td>
</tr>
</tbody>
</table>
| Office Hrs  | M 11:30-12:20  
W 12:30-1:20  
in CW 112 | M 2:30-3:20  
W 11:30-12:20  
in CW 202 | By Appt. in LS 09C |

### The Course
Course Goals and Learning Outcomes

The main object of study are matrices. Formally, a matrix is simply a rectangular array of numbers. However, we will develop an algebra for matrices (how to add and multiply them), and we will explore their connections with linear systems of equations, vector geometry, transformation of data, graphs and networks and much more. The key to success in this class is to read the book regularly, before and after each lecture, attend all the lectures and labs, and start working on homework early.

Course Prerequisites

MATH 205 (General Calculus and Linear Algebra) or MATH 220 (Analytic Geometry and Calculus I).

Textbook


Assignments and Grading

Assignment Types

Final grades will be based on weekly homework assignments both written and online, programming lab assignments, two midterm exams and a final exam. Final grades will be weighted as follows:

- Written Homework: 15%
- Online Quizzes: 15%
- Labs: 15%
- Midterms: 15% (each)
- Final: 25%

Written Homework

Homework will be assigned each week and will be due the following week on Wednesdays at 5:00pm.

You must place your homework in the box under your instructor's name that is located in Cardwell Hall next to room 120. Homework placed in the wrong box will not be graded! Please staple all the sheets and put the assignment number and your name in the front page. Write the statement of each problem and explain all your steps. You are encouraged to work with others on homework but your solution must be written up independently and copying is not permissible.

Show your work! The homework is intended to help you practice and perfect your problem-solving techniques as applied to this course, not to simply see if you can write down the correct answer. Therefore, you must clearly and carefully explain the steps you took in arriving at your answer.

Online Quizzes
The online part of the homework will consist of weekly quizzes in Canvas. These will be due each Monday at 11:00pm.

**Programming Assignments**

There will be approximately a dozen MATLAB projects. Each one will be discussed in the computer lab on Thursdays or Fridays. Instructions will be posted in Canvas. Lab projects will be due on Fridays at 11:00pm in Canvas.

**Midterm Exams**

There will be two coordinated midterm exams

- Exam 1: Wednesday, February 20, 2019, 7:05 PM - 8:30 PM.
- Exam 2: Wednesday, March 27, 7:05 PM - 8:30 PM.

Exam Locations depend on the Lecture you belong to, as follow:

<table>
<thead>
<tr>
<th>Rooms</th>
<th>Umberger Hall 105</th>
<th>Weber Hall 123</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sections</td>
<td>Lecture A (n. 11980)</td>
<td>Lecture B (n. 11979)</td>
</tr>
<tr>
<td></td>
<td>Lecture C (n. 13675)</td>
<td></td>
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</tbody>
</table>

**Final Exams**

The Final will depend on the Lecture you belong to. The times will be as follow (and will be held in the same classroom as the lecture):

<table>
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<th>Bacim Alali</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>MW 10:30</td>
<td>MW 1:30</td>
<td>MW 2:30</td>
</tr>
<tr>
<td>Final</td>
<td>Friday, May 17, 11:50am-1:40pm</td>
<td>Tuesday, May 14, 11:50pm-1:40pm</td>
<td>Thursday, May 16, 4:10pm-6:00pm</td>
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**Letter Grades**

This class will **NOT** follow the usual 90-80-70-60 breakdown. Instead, the grading scheme in Canvas will start out with the 85-75-65-55 breakdown. This will be subject to modifications at the end of the semester.

**Assignment Policies**

**Late or Missing Assignment Policy**

No late homework or lab projects will be accepted.

**Missed exams**

If you expect to miss a midterm exam for a legitimate reason (illness or hospitalization, for example), please notify your instructor as soon as possible. If your instructor deems the absence excusable then your other exams will be weighted to make up for the missing one; otherwise your
score on it will be zero. There will be no make-up exams. A grade of incomplete may be given to a student who has missed more than one midterm or the final exam, if verifiable circumstances warrant it. It is your responsibility to discuss the situation with your recitation instructor should your personal situation suggest this as a possibility.

**Make-up Work**

Make-up work will be granted only if the issue is communicated to the instructor in a timely manner.

**Extra Credit Options**

Extra credit options will not be available in this course.

**Other Topics**

**Technology Requirements**

Students are encouraged to familiarize themselves with the following tools:

- **Matlab**: The programming assignments in this course must be completed using Matlab. Anyone with a valid KState eID will have access to our Matlab licence via this web-site ([https://www.math.ksu.edu/help/](https://www.math.ksu.edu/help/)), by clicking on the light blue rectangle "Matlab Windows Access".

**Technical Difficulties**

The K-State IT Help Desk is there to assist you with questions regarding the technology used for your course.

- **Phone**: 785-532-7722 or toll free 1-800-865-6143
- **Email**: helpdesk@k-state.edu

If you have issues with your technology, please contact them first, they are the technology experts. If you miss a deadline due to technological difficulties, make sure it is documented through communication with the IT Help Desk, then exceptions may be made on a case-by-case basis.

**University Expectations of "Classroom" Conduct**

All student activities in the University, including this course, are governed by the [Student Judicial Conduct Code](https://www.math.ksu.edu/help/) as outlined in the Student Governing Association [By Laws](https://www.math.ksu.edu/help/), Article V, Section 3, number 2. Students who engage in behavior that disrupts the learning environment may be asked to leave the class.

**Student Access Center and Classroom Accommodations**

Students with disabilities who need classroom accommodations, access to technology, or information about emergency building/campus evacuation processes should contact the Student Access Center and/or their instructor. Services are available to students with a wide range of disabilities including, but not limited to, physical disabilities, medical conditions, learning disabilities, attention deficit disorder, depression, and anxiety. If you are a student enrolled in
campus/online courses through the Manhattan or Olathe campuses, contact the Student Access Center at accesscenter@k-state.edu, 785-532-6441; for Salina campus, contact Disability Support Services at 785-826-2984.

**Academic Honesty**

Kansas State University has an Honor and Integrity System based on personal integrity, which is presumed to be sufficient assurance that, in academic matters, one's work is performed honestly and without unauthorized assistance. Undergraduate and graduate students, by registration, acknowledge the jurisdiction of the Honor and Integrity System. The policies and procedures of the Honor and Integrity System apply to all full and part-time students enrolled in undergraduate and graduate courses on-campus, off-campus, and via distance learning. The Honor and Integrity System website can be reached via the following URL: [http://www.k-state.edu/honor](http://www.k-state.edu/honor). A component vital to the Honor and Integrity System is the inclusion of the Honor Pledge which applies to all assignments, examinations, or other course work undertaken by students. The Honor Pledge is implied, whether or not it is stated: "On my honor, as a student, I have neither given nor received unauthorized aid on this academic work." A grade of XF can result from a breach of academic honesty. The F indicates failure in the course; the X indicates the reason is an Honor Pledge violation.

**Copyright**

Copyright is a form of legal protection that allows authors, photographers, composers, and other creators to control some reproduction and distribution of their work. Both student and professors are protected by copyright. Please visit [http://www.k-state.edu/copyright/basics/](http://www.k-state.edu/copyright/basics/) for more information.

**Academic Freedom**

Kansas State University is a community of students, faculty, and staff who work together to discover new knowledge, create new ideas, and share the results of their scholarly inquiry with the wider public. Although new ideas or research results may be controversial or challenge established views, the health and growth of any society requires frank intellectual exchange. Academic freedom protects this type of free exchange and is thus essential to any university's mission.