Instructor information
Érik Amorim, graduate student at Math Dept.

(My last name is sometimes written De Amorim or Deamorim, but please call me Erik.)

Office: Hill Center (the math building), room 624
(There is a pair of elevators that only go up to the 5th floor, but the ones by the library go to my floor too.)
E-mail: erik.amorim@math.rutgers.edu

Sakai: https://sakai.rutgers.edu/portal

All course materials can be found at the Sakai site for this class. Login with your NetID and check under the “sites” tab on the top right. You are expected to check the Sakai page regularly.

Classes and office hours

Classes: Monday thru Thursday, 10:10am-12:10pm, SEC-210 (SERC building, Busch campus)

Office hours: Monday thru Wednesday, 12:15pm-1:15pm in my office (address above)
(Contact me if you’d like to come to office hours but can’t make it at this time)

Contingency plan: In case of an emergency with the instructor, class cancellation and make-up plans will be announced on Sakai. Make sure you are signed up for e-mail notifications from Sakai.

General course information

Prerequisites: CALC2 or 01:640:136 or 138


Visit https://math.rutgers.edu/academics/undergraduate/courses/948-01-640-250-introductory-linear-algebra for more information, review material for exams, etc.

**Things requiring immediate action!!!** ← Please read!

- **Final exam time**: The final exam on 8/14 will be THREE HOURS LONG (10:10 to 1:10, same room where our lectures are). Contact me immediately if you anticipate not being available.
- **ODS**: If you require the Office of Disabilities Services for taking exams, please present your Letter of Accommodations to the instructor in the first week of classes. Full disability policies and procedures are indicated at http://ods.rutgers.edu/.
- **Homework 0**: It is due on the first day of class. You can find it on Sakai under “Assignments”.
- **Excused absences**: If you already know of a day when you’ll not be able to attend lecture for a compelling reason, arrange for proper documentation in advance and let me know as soon as possible.
Grade Breakdown
Your final grade is a weighted average of your grades on each category, as follows:

- **Final exam**: 35%
- **Midterm exam**: 25%
- **Quizzes**: 20%
- **Homeworks**: 15%
- **Other**: 5%

The “other” category mainly consists of participation and mini-quizzes (see below). Missed lectures, recurrent tardiness and class disruption will negatively affect this category, at the instructor’s discretion.

Exams and quizzes
- **8 quizzes**: 20 minutes, during lecture, most Tuesdays and Thursdays. Lowest quiz grade is dropped.
- **1 midterm**: 2 hours, 10:10am-12:10am, in the same class, on 7/25.
- **1 final**: 3 hours long, 10:10am-1:10pm, in the same class, on 8/14.

Mini-quizzes
Mini-quizzes will be given during the lecture period on days when we don't have a quiz or exam. They are small and easy tests of about 10 minutes, on the material covered on that same day, serving as a self-check of understanding for students, and also as a break from the lecturing format of the class. It will wake you up! You are allowed to consult the material, myself, and even your colleagues during these. Group work is encouraged, provided that you write up the solutions in your own words. But please be advised that good performance on mini-quizzes is by no means an indicator of good performance in the class - they are easy and worth only up to 5% of your final grade.

Homeworks
A total of about 6 or 7 homeworks will be assigned (posted on Sakai). Each one is divided into two parts that are submitted separately by different means:
- **Part A**: Contains mostly routine problems. Must be submitted online to Sakai (a scan or a good picture) by the due date, to be graded by a remote grader hired to help with this class.
- **Part B**: Contains more challenging problems (conceptual or proof-based). Must be handed in as a physical copy at the start of lecture on their due date (handwritten or typed) and will be graded by me. If turned in after 10:20am there will be a grade penalty for lateness. Cannot be submitted after the class period. Loose pages must be stapled together (paperclips not accepted), or there will be a grade penalty.

Also note that there is a Homework 0 already available on Sakai and due on the first day of class.

Other policies
- **Attendance**: You are expected to attend every lecture and be on time. Absences for valid reasons (illness, major outside commitment, major emergency) must be justified with proper documentation. You are entitled to 1 unexcused absence during the course (no questions asked), but subsequent absences or recurrent tardiness will affect your “other” grade category at the instructor’s discretion. The page [https://sims.rutgers.edu/ssra/](https://sims.rutgers.edu/ssra/) contains information about how to report an upcoming absence and the university policies that go with it.
• **Academic integrity:** *For homeworks and mini-quizzes, you are allowed and encouraged to discuss with others, consult class materials and other sources (and give them proper credit), but the work you submit must be your own (do not copy). You are not allowed to hire someone or use an online service (this includes Chegg) to do your homework for you. Asking for help is different from having someone give you all answers. During regular quizzes and exams, you are not allowed to communicate with other students, to use calculators, and to consult any material. The consequences of cheating will be taken seriously, according to policies at [http://academicintegrity.rutgers.edu/academic-integrity-policy/](http://academicintegrity.rutgers.edu/academic-integrity-policy/).*

• **Phone use in class:** Strongly discouraged. If you absolutely need to look at your phone during lecture, make it brief and as discreet as you can, because it is a distraction to others around you.

• **No make-up quizzes:** There are no make-ups *for any reason*, even a valid documented emergency. But the lowest quiz grade will be dropped, so consider this as an insurance policy for possible emergencies you may have. (In case a student has to miss more than one quiz for a valid reason, his or her case will be evaluated by the instructor separately.)

• **No make-up midterm:** A student who is excused from the midterm exam due to well-documented emergency will not take a make-up; instead his or her final exam will be worth the combined weight of 60% of the grade. *This is not an option that you can choose to pursue, it is intended only for students who were forced to be absent from the midterm due to truly compelling circumstances!*

• **Every student must take a final exam:** In case of excused absence, a make-up final must be arranged with the instructor.

• “I overslept” is not a valid reason (for anything in life). This is a morning class, so please make an effort, be a responsible human being and show up on time.

**Advice on taking a fast-paced course**

• Be aware that this class proceeds in a very fast pace, unlike anything you may be used to during regular Fall and Spring semesters. We are covering almost an entire book in just 6 weeks!

• You MUST take action the moment you start falling back on the material, otherwise you will stop following the next day. That’s why we have office hours almost every day after class.

• My favorite Pokémon is Sudowoodo. This line is here because it will be tested on Homework 0. I really want you to read this entire syllabus.

• Missing the first 10 minutes of class means you won’t be able to follow anything the rest of the day. Make sure to be in class before we start.

• The page [https://webapps.rutgers.edu/student-rlc/Tutor/Main/Student/StudentSearch](https://webapps.rutgers.edu/student-rlc/Tutor/Main/Student/StudentSearch) might be useful if you are looking for peer tutoring assigned through the university.

**Calendar**

On the next page you can find an approximate schedule of classes with a general outline of the material covered each day, which may change slightly as the course progresses. If we start falling behind schedule, sections marked with an asterisk* may be skipped. We will follow the book very closely, but mostly skipping sections involving practical applications as well as the last chapter, which belongs in a more advanced, proof-based algebra class.
<table>
<thead>
<tr>
<th>Date</th>
<th>Sections covered</th>
<th>Main topics</th>
<th>Exams and quizzes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mon 7/8</td>
<td>1.1, 1.2</td>
<td>Matrices, vectors, linear combinations</td>
<td></td>
</tr>
<tr>
<td>Tue 7/9</td>
<td>1.2, 1.3</td>
<td>Linear systems</td>
<td></td>
</tr>
<tr>
<td>Wed 7/10</td>
<td>1.4, 1.6</td>
<td>Gaussian Elimination, rank and nullity, span</td>
<td></td>
</tr>
<tr>
<td>Thu 7/11</td>
<td>1.6, 1.7</td>
<td>Linear (in-)dependence</td>
<td>QUIZ 1</td>
</tr>
<tr>
<td>Mon 7/15</td>
<td>2.1, 2.3</td>
<td>Matrix inverse</td>
<td></td>
</tr>
<tr>
<td>Tue 7/16</td>
<td>2.3, 2.4</td>
<td>Elementary matrices, matrix inversion</td>
<td>QUIZ 2</td>
</tr>
<tr>
<td>Wed 7/17</td>
<td>2.6*, 2.7</td>
<td>LU decomposition*, linear transformations and their matrices</td>
<td></td>
</tr>
<tr>
<td>Thu 7/18</td>
<td>2.8</td>
<td>Composition and invertibility of linear transformations</td>
<td>QUIZ 3</td>
</tr>
<tr>
<td>Mon 7/22</td>
<td>3.1, 3.2</td>
<td>Determinants</td>
<td></td>
</tr>
<tr>
<td>Tue 7/23</td>
<td>3.2, 4.1</td>
<td>Cramer’s Rule*, subspaces</td>
<td>QUIZ 4</td>
</tr>
<tr>
<td>Wed 7/24</td>
<td>4.2, 4.3</td>
<td>Bases and dimension, column and null spaces</td>
<td></td>
</tr>
<tr>
<td>Thu 7/25</td>
<td></td>
<td></td>
<td>MIDTERM EXAM</td>
</tr>
<tr>
<td>Mon 7/29</td>
<td>4.3, 4.4</td>
<td>Coordinate systems</td>
<td></td>
</tr>
<tr>
<td>Tue 7/30</td>
<td>4.5</td>
<td>Matrices in different coordinate systems</td>
<td>QUIZ 5</td>
</tr>
<tr>
<td>Wed 7/31</td>
<td>5.1, 5.2</td>
<td>“Eigenstuff,” characteristic polynomial</td>
<td></td>
</tr>
<tr>
<td>Thu 8/1</td>
<td>5.2, 5.3</td>
<td>Diagonalization</td>
<td>QUIZ 6</td>
</tr>
<tr>
<td>Mon 8/5</td>
<td>5.4, 5.5</td>
<td>Markov chains, difference equations*</td>
<td></td>
</tr>
<tr>
<td>Tue 8/6</td>
<td>6.1, 6.2</td>
<td>Geometry of vectors, orthogonality</td>
<td>QUIZ 7</td>
</tr>
<tr>
<td>Wed 8/7</td>
<td>6.2, 6.3</td>
<td>Gram-Schmidt algorithm, orthogonal complements, orthogonal projection</td>
<td></td>
</tr>
<tr>
<td>Thu 8/8</td>
<td>6.4, 6.5</td>
<td>Least squares algorithm, orthogonal matrices</td>
<td>QUIZ 8</td>
</tr>
<tr>
<td>Mon 8/12</td>
<td>6.6</td>
<td>Symmetric matrices, quadratic forms*</td>
<td></td>
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<tr>
<td>Tue 8/13</td>
<td>???</td>
<td>Catch-up!</td>
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<tr>
<td>Wed 8/14</td>
<td></td>
<td></td>
<td>FINAL EXAM</td>
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Course overview

In high school you likely studied systems of linear equations and solved them using different methods. But sometimes you find a unique solution, sometimes infinitely many (there are free variables) and sometimes no solution at all (there are inconsistencies in the equations). In this class we will build up the theoretical framework underlying this phenomenon, which is based on vectors and matrices, and study simple algorithms that can in some sense quantify the degree to which a system is inconsistent or has infinitely many solutions. But vectors are naturally geometric objects, and matrices can act on them by transforming them into other vectors, so it turns out that these ideas have wide applicability for both theoretical and practical purposes in different areas of science involving either geometry or algebra, and the unifying concept behind it all is that of a linear transformation.

In this class, we will study both the theoretical mathematics and the algorithms provided by the theory of linear transformations, using the language of matrices and vectors, with the emphasis on being able to apply the algorithms, but not neglecting the understanding of the theory (in other words, expect a few problems that require conceptual understanding and some actual thinking on exams and especially homeworks).