**MATH 131: Linear Algebra I**
University of California, Riverside
Summer 2019 (Session A)

## General information

**Instructor:** Ryan Ta
**Teaching assistant:** same as instructor
**E-mail address:** ryanta@math.ucr.edu
**Course webpage:** http://math.ucr.edu/~ryanta/teaching/math131_summer2019
**Lecture:** Monday, Tuesday, Wednesday, Thursday 12:10 p.m. – 1:30 p.m. at CHASS 2136
**Discussion:** Wednesday 2:10 p.m. – 4:00 p.m. at CHASS 1134
**Office hours:** Monday, Tuesday, Wednesday, Thursday 11:10 a.m. – 12:00 p.m. at Skye Hall 277

I will post all course materials on our course webpage. Please bookmark that page because I will be updating it frequently as we move along in our class. We will only be using iLearn for grades, announcements, and online mathematics discussions.

You may e-mail me general questions or anything that you would like to discuss with me privately. Please post all mathematics questions on our discussion board (titled "Ask math questions here") on our iLearn, and I will answer your questions on there. If your e-mail contains a question in linear algebra or proof writing, then I reserve the right to share your question in our discussion board so that everyone in our class can benefit from your question.

I reserve the right to modify this syllabus at any time. I will inform you all of any changes made.

## Textbook

We will be using the textbook *Linear Algebra Done Right (third edition)* by Sheldon Axler. If you are using a computer on the UCR campus, the PDF file of this textbook can be downloaded from Springer for free. However, if it is also possible, I highly recommend that you purchase a hard copy of the textbook in order to use it during our lectures and discussions. In our course, we will be covering Chapters 1,2,3 of the textbook. It is also recommended, but not required, that you watch the supplemental YouTube videos from the textbook author himself before each lecture. I linked the relevant videos on both the course webpage and on our iLearn.

## Homework

There will be five homework assignments in this course, each worth 20 points, for a total of 100 points. Your homework consists of assigned exercises from the Axler textbook. Homework assignments are due on Mondays and the day of the final exam. I will grade your homework on a mixture of completion and accuracy; solutions containing serious errors will cause you to lose some points. I do not accept late submissions. If you cannot make it to class when the homework is due, please e-mail me an attached PDF of your homework before 11:59 p.m. of that day. (Make sure that I can read the contents of your PDF!)

## Exams and quizzes

There will be five group examinations in this course, each worth 100 points, for a total of 500 points. You will take all group exams on Thursdays in lecture, with the sole exception of Group Exam 2 on Wednesday July 3 in discussion because of the Independence Day holiday on Thursday July 4. Each group exam will have five questions, each worth 20 points, so that each group exam is worth 100 points. The questions will typically contain questions similar to the assigned exercises from the Axler textbook. In a group exam, all students in the class will be allowed (and encouraged!) to collaborate with one another on the exam questions. You can freely move about in the classroom in order to speak to and share work with all your classmates, but you must write your own solutions, and you are not allowed to leave the classroom except to use the restroom. The time limit for group exams is 1 hour (60 minutes).

There will be four quizzes in this course, each worth 50 points, for a total of 200 points. You will take all quizzes on Wednesdays in discussion except on July 3. Each quiz will have five questions, each worth 10 points, so that each quiz is worth 50 points. Some of the questions will assess the technique of proof that was covered on the same discussion day. The remaining questions will ask to prove linear algebra results covered in recent

lecture notes. Like group exams, the quizzes are open textbook, open notes, and open homework. However, unlike group exams, no collaboration or talking is allowed during quizzes. All other resources are prohibited. You are not allowed to leave the classroom except to use the restroom. The time limit for quizzes is 45 minutes.

The final examination will take place on Saturday, July 29, 1:00 p.m. – 4:00 p.m. in CHASS 2136. The final exam will be cumulative and consist of four questions—each worth 25 points—and two equations—each worth 50 points—for a total of 200 points. No resources can be used, and no talking or collaboration of any type will be allowed on the final exam. The time limit for the final exam is 3 hours (180 minutes). The final exam is mandatory in order to receive a passing grade (see "Grading" section).

You must take each exam/quiz at the designated day and time. Typically, no make-ups will be allowed. Exceptions will only be given in select circumstances such as religious reasons, participation in intercollegiate sports, illness or injury, etc.. I may require you to provide supporting documentation.

## How exams and quizzes will be proctored

If you have a cellular phone with you, you will need to turn your cell phone off (not put on silent or vibrate—*turned off*) and set it on the desk in front of you before you can take any exam/quiz. If you do not have a cell phone with you, please let me know. If your cell phone goes off during an exam/quiz, I will take your exam/quiz and dismiss you. Your exam/quiz will be graded for the work you have written down before I took your exam. If you interact with your phone during any exam/quiz, that will be considered cheating; please see the next section on academic integrity.

If you have to use the restroom during an exam/quiz, please notify me and I will typically allow you to leave the classroom only one time per exam/quiz, including the final exam. You will not be able to make up for lost time as a result of leaving the classroom. Only one student at a time is allowed to leave the classroom. You cannot bring your cell phone or other personal belongings with you while using the restroom; if you do, then I will take your exam/quiz and dismiss you. Also, you only have up to 15 minutes to use the restroom, and I will make note of the time. If 15 minutes has elapsed and you have not yet returned to the classroom, then I will take your exam/quiz and dismiss you. If you leave the classroom more than once, or if you leave the classroom while another student is using the restroom, I will take your exam/quiz and dismiss you. Your exam/quiz will be graded for the work you have written down before I took your exam.

## Academic integrity

Academic dishonesty will not be tolerated in this class. Any attempt to cheat will result in an automatic grade of "F" for the course. You will not be allowed to drop the course, and your case will be forwarded to the student conduct committee. You will receive a disciplinary sanction appropriate for your misconduct, following UC Riverside's policy.

As conveyed already, please do not cheat. The only typical ways to cheat in this class are using unauthorized resources or violating my proctoring policies during an exam/quiz. For example, authorized resources include: the Axler textbook, lecture notes in this course, homework solutions to assigned problems, but unauthorized resources include but are not limited to: any textbook different from Axler, external lecture notes, and solutions to math problems not assigned in this class. Understand that classmates are an authorized resource during group exams but are also an unauthorized resource during quizzes. Anyone caught attempting to use unauthorized resources will be subject to the consequences outlined by the previous paragraph.

## Grading

The grading in this course will be point-based and broken down into the following categories:

| Item | Points possible |
|---|---|
| Homework | 100 |
| Quizzes | 200 |
| Group exams | 500 |
| Final exam | 200 |
| Grand total | 1000 |

Your letter grade will be determined by the following grading scale:

| Your grand total | Letter grade |
|---|---|
| 950 – 1000 | A+ |
| 900 – 949 | A |
| 850 – 899 | A- |
| 800 – 859 | B+ |
| 750 – 799 | B |
| 700 – 749 | B- |
| 650 – 699 | C+ |
| 600 – 649 | C |
| 550 – 599 | C- |
| 400 – 549 | D |
| 0 – 399 | F |

I will not round up your point total no matter how close it is to the borderline of the next letter grade.

You *must* take the final examination in order to be able to receive a passing grade for this course. If you do not take the final examination, then the above grading scale will not apply to you, and you will automatically receive a grade of "F" in the course. This is a math department policy.

## Course calendar

Here is a tentative outline of our course as organized in the calendar below:

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|---|---|---|---|---|---|---|
| June 23 | June 24<br>Lecture<br>Syllabus<br>Axler 1.A | June 25<br>Lecture<br>Axler 1.B | June 26<br>Lecture<br>Axler 1.C<br>Discussion<br>Direct proof<br>Quiz 1 | June 27<br>Lecture<br>Review<br>Group exam 1 | June 28 | June 29 |
| June 30 | July 1<br>Lecture<br>HW 1 due<br>Axler 2.A | July 2<br>Lecture<br>Axler 2.B | July 3<br>Lecture<br>Axler 2.C<br>Discussion<br>Review<br>Group exam 2 | July 4<br>Holiday | July 5 | July 6 |
| July 7 | July 8<br>Lecture<br>HW 2 due<br>Axler 3.A | July 9<br>Lecture<br>Axler 3.B | July 10<br>Lecture<br>Axler 3.C (1)<br>Discussion<br>Contradiction<br>Quiz 2 | July 11<br>Lecture<br>Review<br>Group exam 3 | July 12 | July 13 |
| July 14 | July 15<br>Lecture<br>HW 3 due<br>Axler 3.C (2) | July 16<br>Lecture<br>Axler 3.D | July 17<br>Lecture<br>Axler 3.E (1)<br>Discussion<br>Contrapositive<br>Quiz 3 | July 18<br>Lecture<br>Review<br>Group exam 4 | July 19 | July 20 |
| July 21 | July 22<br>Lecture<br>HW 4 due<br>Axler 3.E (2) | July 23<br>Lecture<br>Axler 3.F (1) | July 24<br>Lecture<br>Axler 3.F (2)<br>Discussion<br>Induction<br>Quiz 4 | July 25<br>Lecture<br>Review<br>Group exam 5 | July 26 | July 27<br>Classroom<br>HW 5 due<br>Final exam |

Some deviations from this calendar may be necessary due to unforeseen events.

## Students with disabilities

UC Riverside is committed to providing equal access to learning opportunities to students with documented disabilities. To ensure access to this class, and your program, please contact the Student Disability Resource Center (SDRC) to engage in a confidential conversation about the process for requesting accommodations in the classroom. More information can be found on https://sdrc.ucr.edu. If you are a student registered with the SDRC, please ensure you request your quarterly accommodations through https://rability.ucr.edu.

## Some informal advice

MATH 131 is a second course in linear algebra, with a lot of mathematical proof writing. This course demands more mathematical maturity than computation-based courses such as first-year calculus. Also, this course is very fast-paced because we have to accomplish a quarter's worth of material in five weeks. These situations explain why I made the grading scale to be lenient for this summer course. A small portion of your overall grade will depend on your ability to write proofs; specifically, this will be reflected in your quiz scores. If this is your first time with proof writing, then you may struggle, but this is a normal process and in fact a good indication that you are really learning the material. I intend to make this course challenging but at the same time not too stressful. If there is anything that interferes your ability to be successful in this course, please feel free to tell me in confidence; I want to help make your experience with this course a positive one.