Title of Course: MATH:2700:0231 Introduction to Linear Algebra
Course meeting time and place: 2:30 - 3:20 pm, MTWTh in 112 MH
Department of Mathematics: https://math.uiowa.edu

Course ICON site: To access the course site, log into Iowa Courses Online (ICON) https://icon.uiowa.edu/index.shtml using your Hawk ID and password.

Course Home
The College of Liberal Arts and Sciences (CLAS) is the home of this course, and CLAS governs the add and drop deadlines, the “second-grade only” option (SGO), academic misconduct policies, and other undergraduate policies and procedures. Other UI colleges may have different policies.

Instructor Valentyna Bezugla
Office location: 1B MLH (MacLean Hall)
Office hours: MTW 1:00 – 2:00 pm or by appointment
E-mail: valentyna-bezugla@uiowa.edu

DEO Contact Information: Associate professor Ryan Kinser, 14 MLH, ryan-kinser@uiowa.edu

Description of Course:
This course presents the fundamental concepts, methods, and techniques of linear algebra. Topics include the solution of systems of linear equations, matrices, reduction to row echelon form, rank, nullity, determinants, vectors in n-dimensional Euclidean space, general vector spaces, dimension, linear transformations, change of basis, eigenvalues and eigenvectors, diagonalization, symmetric matrices.

Linear algebra is important for two fundamental reasons: (i) Linear equations are essentially the only equations that can be solved, especially when more than one variable is involved. A large portion of applied mathematics is devoted to transforming non-linear problems into linear equations that can be solved. (ii) Linear algebra is a gateway to modern mathematics. The key concepts of linear algebra are matrices and matrix algebra. Matrices are used for solutions of linear equations, the study of properties of linear transformations, the description of various vector spaces, etc. In the course, we will discuss the geometry of Euclidean spaces, eigenvalues and eigenvectors, diagonalization of matrices, orthogonal diagonalization of symmetric matrices, and many other fundamental notions.
Objectives and Goals of the Course

This course introduces students to vectors, linear transformations, and matrices. The course begins with a careful study of the solution of linear systems of equations and ends with the orthogonal diagonalization of symmetric matrices. Topics include row reduction, matrix algebra, determinants, bases, dimension, rank, nullity, eigenvalues, and eigenvectors.

One of the goals is to give the students a good grounding in basic linear algebra. This means giving you the tools to solve systems of linear equations in more than one variable and giving you what you may need in order to manipulate matrices and linear transformations.

Textbook

MyLab Math With Pearson Etext For Linear Algebra And Its Applications Required

ISBN: 9780135851203

Author: David C. Lay, Steven R. Lay, Judi J. McDonald

Publisher: Pearson ©2020

We will use the online edition with the MyLab exercises, which is available through ICON.

Material to be covered from the Text: Chapters 1-7, some sections will be omitted.

Tentative timetable

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Chapters(sections)</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>1 (1-9)</td>
<td>Linear equations</td>
</tr>
<tr>
<td>3-5</td>
<td>2 (1-4, 8, 9)</td>
<td>Matrix algebra</td>
</tr>
<tr>
<td>6</td>
<td>3 (1-3)</td>
<td>Determinants</td>
</tr>
<tr>
<td>7-10</td>
<td>4 (1-7)</td>
<td>Vector spaces</td>
</tr>
<tr>
<td>11-13</td>
<td>5 (1-4)</td>
<td>Eigenvalues and eigenvectors</td>
</tr>
<tr>
<td>13-14</td>
<td>6 (1-4)</td>
<td>Orthogonality</td>
</tr>
<tr>
<td>15</td>
<td>7 (1, 2)</td>
<td>Symmetric matrices and quadratic forms</td>
</tr>
</tbody>
</table>
Course Grades

Final course grades will be assessed based on the homework, quizzes, midterm exams, the final exam and course response/attendance as follows:

Homework: 15%, assigned weekly on ICON via MyLab and Mastering
Quizzes: 10%
Midterm 1: 20%, Thursday, February 23, 2:30-3:20 pm
Midterm 2: 20%, Thursday, March 30, 2:30-3:20 pm
Final exam 30%, TBA
Course Response/Attendance (over Top Hat): 5%

Grading System

Letter grades at the end of the course will be determined by the final weighted score as computed using the above percentages. A +/- grading scheme will be used. The cutoff scores for the different letter grades will not be lower than the following

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90 to 100</td>
</tr>
<tr>
<td>B</td>
<td>75 to 89</td>
</tr>
<tr>
<td>C</td>
<td>56 to 74</td>
</tr>
<tr>
<td>D</td>
<td>50 to 55</td>
</tr>
<tr>
<td>F</td>
<td>below 50</td>
</tr>
</tbody>
</table>

The instructor reserves the right to adjust these cutoffs if the instructor believes there are reasons to do so.

Date and Time of the Final Exam

The date and time of every final examination is announced by the Registrar generally by the fifth week of the classes. All students should plan on being at the UI through the final examination period. Once the Registrar has announced the date, time, and location of each final exam, the complete schedule will be published on the Registrar's web site and will be shared with instructors and students.

It is the student's responsibility to know the date, time, and place of the final exam.

Course policies:

- Academic Honesty and Misconduct
  All students in CLAS courses are expected to abide by the CLAS Code of Academic Honesty. Undergraduate academic misconduct must be reported by instructors to CLAS according to these procedures. Graduate academic misconduct must be reported to the Graduate College according to Section F of the Graduate College Manual.

- Rules on student collaboration
  Students are encouraged to discuss homework. However, all homework submitted must be your own work. No material in a quiz or exam can be discussed with other students while the quiz or exam is in progress.
• **Student Complaints**

If you have a complaint, I would appreciate you coming to me about it first, so that we can create a way of overcoming the difficulty. If we are unable to resolve the problem, you can discuss it with the Chairman of the Department. In summary, the chain is: your instructor, then the Chairman of the Department of Mathematics Associate professor Ryan Kinser, and then an appropriate Dean. The Department of Mathematics has offices in 14 MLH. To make an appointment to talk to the Chairman of the Department call 335-0714 or contact the departmental secretary in 14 MLH. Undergraduate students should contact [CLAS Undergraduate Programs](#) for support when the matter is not resolved at the previous level.

• **Drop Deadline for this Course**

You may drop an individual course before the deadline; after this deadline you will need collegiate approval. You can look up the drop deadline for this course here. When you drop a course, a "W" will appear on your transcript. The mark of "W" is a neutral mark that does not affect your GPA. Directions for adding or dropping a course and other registration changes can be found on the [Registrar’s website](#). Undergraduate students can find policies on dropping and withdrawing [here](#).

• **Class attendance**

Attending and participating in class will increase your chances of doing well in the course. During the lectures, you will be using your Top Hat account to indicate you are attending the lecture and to answer questions about the lecture material. You will earn points for each question you answered. Attendance and correct answers will bring you up to 5% of your final grade.

**Homework** will be posted weekly (beginning the second week) on ICON via MyLab and Mastering.

**Quizzes** will be given approximately every other week depending on the section. Problems will be similar to those assigned as homework. The dates of quizzes will be announced in advance.

**Exams**

There will be two in-class exams and a final exam. The midterm exams will cover the material covered up to that point in the class. The final exam will be comprehensive (that is, cover all material covered in the class).

**Make-ups** may be given for the exams missed due to unavoidable circumstances and compelling reasons which are documented in writing. If you have a conflict or a medical reason, discuss your situation with the instructor as soon as possible. Students with mandatory religious obligations or UI authorized activities must discuss their absences with me as soon as possible. Religious obligations must be communicated within the first three weeks of classes.
Communication: UI Email
Students are responsible for all official correspondences sent to their UI email address (uiowa.edu) and must use this address for any communication with instructors or staff in the UI community.

Where to Get Help

- The Math Tutorial Lab, 125 MLH. For more information, go to http://www.math.uiowa.edu/math-tutoriallab
- 24/7 Pearson Tech support https://support.pearson.com/getsupport/s/

Additional Notes to Students

1. I am planning to use ICON page for posting grades and other course material. Also, some announcements may be e-mailed through ICON to your UI e-mail. Check ICON and your UI e-mail regularly, and make sure that UI has your correct e-mail address.

2. The course plan may be modified during the semester. All changes will be announced in advance during class periods; the student has the responsibility for keeping up with such changes.

University Policies

Accommodations for Students with Disabilities
Basic Needs and Support for Students
Classroom Expectations
Exam Make-up Owing to Absence
Free Speech and Expression
Mental Health
Military Service Obligations
Non-discrimination
Religious Holy Days
Sexual Harassment/Misconduct and Supportive Measures
Sharing of Class Recordings