

# Syllabus for MA 35100: Elementary Linear Algebra

Spring 2024, Section 130

January 8th, 2024 (Last Updated: April 6th)

## 1 Course Information and Description

### **MA 35100: Elementary Linear Algebra (Section: 130)**

Lecture: MWF, 1:30 PM to 2:20 PM in HAMP 2101

Office Hours: MF, 2:30 PM to 4:00 PM in MATH 445 (or by appt.)

Link: [math.purdue.edu/~sahay5/spring2024/ma35100/](http://math.purdue.edu/~sahay5/spring2024/ma35100/)

- CRN: 20841
- Instruction Modality: Face-to-Face (In-Person)
- Credit Hours: 3.00
- Topics: Systems of linear equations, finite dimensional vector spaces, matrices, determinants, eigenvalues and eigenvector applications to analytical geometry. Not open to students with credit in MA 26500.
- Prerequisites: Any of Undergraduate level MA 17200, MA 17400, MA 18200, MA 26100, MA 26300, MA 27100 with a Minimum Grade of C-. Not open to students with credit in MA 26500.

## 2 Instructor

**Anurag Sahay**

Email: [anuragsahay@purdue.edu](mailto:anuragsahay@purdue.edu)

Office: MATH 445

Office Hours: MF, 2:30 PM to 4:00 PM (or by appt.)

### 3 Grader

Kabir Oluwatobi Idowu  
Email: kidowu@purdue.edu  
Office: MATH 443

### 4 Learning Resources

The textbook for the course is *Linear Algebra, Ideas and Applications (4th Edition)* by Richard C. Penney.

The textbook is available via Purdue's library system in both e-copy and hardcopy; please see this link for details about how to access an e-copy. Hardcopies of the book are on reserve at the Mathematical Sciences Library. You are not required to purchase the book or a MyLab subscription for this course.

Gradescope will be used for homework submission, and Brightspace will be used for announcements and emails.

**The use of AI and LLMs (large-language models) is not permitted in this course for any assessed work (such as homework submissions).** The use of AI/LLMs for assessed work shall be considered cheating, and will be reported to the Office of the Dean of Students.

### 5 Grading

Assignment	Due Date	Weight
Written Homework	Weekly	25%
Midterm 1	February 20th	20%
Midterm 2	April 2nd	20%
Final Exam	April 30th	35%

## Grading Scale

Following the Department of Mathematics policy, students in this course whose course averages are:

- at least **97%** are guaranteed a course grade of **A+**
- at least **93%** are guaranteed a course grade of **A**
- at least **90%** are guaranteed a course grade of **A-**
- at least **87%** are guaranteed a course grade of **B+**
- at least **83%** are guaranteed a course grade of **B**
- at least **80%** are guaranteed a course grade of **B-**
- at least **77%** are guaranteed a course grade of **C+**
- at least **73%** are guaranteed a course grade of **C**
- at least **70%** are guaranteed a course grade of **C-**
- at least **67%** are guaranteed a course grade of **D+**
- at least **63%** are guaranteed a course grade of **D**

It is possible that these percentages may be lowered at the end of the semester, but they will not be raised. Borderline cases will be considered on a case-by-case basis.

## 6 Learning Outcomes

- Learn standard methods to solve linear systems of equations.
- Learn properties of matrices, learn about column, row, and null spaces.
- Introduction to abstract vector spaces their properties and applications.
- Learn the Rank-Nullity Theorem.
- Learn the Fundamental Theorem of Linear Algebra.
- Learn the LU Factorization.
- Learn properties and applications of determinants.
- Learn diagonalization of matrices and applications.

- Learn the basic theory of eigenvalues and eigenvectors and applications to systems of linear differential equations.
- Learn how to construct matrix representations of linear transformations.
- Learn some assorted applications of linear algebra.

## 7 Homework

- There will typically be one homework due every week starting from January 19th. Please see the detailed schedule on the section webpage for exact deadlines.
- The three lowest homework scores will be dropped from the final grade.
- One late homework will be accepted with no questions asked.
- Submissions can be hand-written or typed in L<sup>A</sup>T<sub>E</sub>X and must be submitted via Gradescope.
- Students are allowed to discuss and collaborate on problems. However, each student must work on the final submission on their own. In particular, **copying someone else's final submission will be considered cheating and will be reported to the Office of the Dean of Students.**
- HW sets will be made available on the course webpage.

## 8 Exams

- There will be two midterm exams and one final exam (all three in-person).
- Exams will be a combination of short answer and multiple-choice questions.
- Exams will be uploaded to and graded on Gradescope.
- Midterm 1 will take place on **Tuesday, February 20th from 8:00 PM to 9:00 PM in BRNG 2290.**
- Midterm 2 will take place on **Tuesday, April 2nd from 8:00 PM to 9:00 PM in BRNG 2290.**
- The Final Exam will take place on **Tuesday, April 3rd from 7:00 PM to 9:00 PM in PHYS 203.**

- Topics for the Midterms can be found on the section webpage. The final exam will be comprehensive (i.e., will cover the entire course). However, there will be an emphasis on topics covered after Midterm 2.
- Students with disabilities may be entitled to accommodations such as extra time. Please see the section entitled “Accommodations for Students with Disabilities” below.

## 9 Schedule

The detailed schedule is available on the section webpage.

## 10 Important Dates

Students should consult the academic calendar to find information about campus-wide dates such as the last day to withdraw from classes. Other important dates include:

1. Classes begin Monday, January 8th.
2. No classes MLK Holiday, Monday, January 15th.
3. Last date to drop a course with **W**, Wednesday, April 24th (5 PM).
4. Midterm Exam 1: Tuesday, February 20th (8:00 PM to 9:00 PM)
5. Midterm Exam 2: Tuesday, April 2nd (8:00 PM to 9:00 PM).
6. Spring Break: March 11th-16th.
7. Quiet Period: April 22th-27th.
8. Classes end Saturday, April 27th.
9. Final Exam Week: April 29th-May 4th.
10. Grades due by Tuesday, May 7th (5 PM).

## 11 Attendance

Please review the academic regulations that govern attendance at Purdue University.

While attendance in lectures is strongly encouraged, it shall not be enforced. Students are free to miss any class as long as they take the responsibility of learning material covered in missed classes on their own.

Attendance for assessed work (i.e., exams) is mandatory. Absences are only allowed for approved university reasons such as:

- Grief/Bereavement
- Military Service
- Jury Duty
- Parenting Leave
- Medical Excuse

Please review the University's policies on these matters (available at the link above).

## 12 Boilerplate Messages

This course adheres to Purdue University's academic regulations. The subsections in this section include boilerplate language involving some of these regulations which apply to most (if not all) courses you take. If the University's regulations are updated during the semester in a manner which affect these boilerplate messages, then the most recent update will apply (which may not be what is in this syllabus).

### 12.1 Accommodations for Students with Disabilities

Purdue University strives to make learning experiences accessible to all participants. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: [drc@purdue.edu](mailto:drc@purdue.edu) or by phone at 765-494-1247.

If you have been certified by the Disability Resource Center (DRC) as eligible for accommodations, you should contact your instructor to discuss your accommodations as soon as possible. Here are instructions for sending your Course Accessibility Letter to your instructor: <https://www.purdue.edu/drc/students/course-accessibility-letter.php>

## 12.2 Attendance

This course follows Purdue's academic regulations regarding attendance, which states that students are expected to be present for every meeting of the classes in which they are enrolled. When conflicts or absences can be anticipated, such as for many University-sponsored activities and religious observations, the student should inform the instructor of the situation as far in advance as possible. For unanticipated or emergency absences when advance notification to the instructor is not possible, the student should contact the instructor as soon as possible by email or phone. When the student is unable to make direct contact with the instructor and is unable to leave word with the instructor's department because of circumstances beyond the student's control, and in cases falling under excused absence regulations, the student or the student's representative should contact or go to the Office of the Dean of Students website to complete appropriate forms for instructor notification. Under academic regulations, excused absences may be granted for cases of grief/bereavement, military service, jury duty, and parenting leave. There is now a Medically Excused Absence Policy for Students. For details, see the Academic Regulations and Student Conduct section of the University Catalog website.

## 12.3 Academic Integrity

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing [integrity@purdue.edu](mailto:integrity@purdue.edu), or by calling 765-494-8778, or by contacting the Office of the Dean of Students ([purdue.edu/odos/](http://purdue.edu/odos/)). While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern. Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty" (Section B.2.a of the Student Regulations). Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of ghostwritten papers, the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest." Incidents of academic misconduct in this course will be addressed by the course instructor and referred to the Office of Student Rights and Responsibilities (OSRR) for review at the university level. Any violation of course policies as it relates to academic integrity will result minimally in a failing or zero grade for that particular

assignment or test, and at the instructors discretion may result in a failing grade for the course. In addition, all incidents of academic misconduct will be forwarded to OSRR, where university penalties, including removal from the university, may be considered.

## **12.4 Nondiscrimination Statement**

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. More details are available on our course Brightspace table of contents, under University Policies. Purdue's nondiscrimination policy can be found at [purdue.edu/purdue/ea\\_eou\\_statement.php](http://purdue.edu/purdue/ea_eou_statement.php).

## **12.5 Basic Needs Security**

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. There is no appointment needed and Student Support Services is available to serve students 8 AM-5 PM, Monday through Friday

## **12.6 Academic Guidance in the Event Students are Quarantined/Isolated**

If you become quarantined or isolated at any point in time during the semester, in addition to support from the Protect Purdue Health Center, you will also have access to an Academic Case Manager who can provide you academic support during this time. Your Academic Case Manager can be reached at [acmq@purdue.edu](mailto:acmq@purdue.edu) and will provide you with general guidelines/resources around communicating with your instructors, be available for academic support, and offer suggestions for how to be successful when learning remotely. Importantly, if you find yourself too sick to progress in the course, notify your academic case manager and notify your professor and TA via email or Brightspace. They will make arrangements based on your particular situation. The Office of the Dean of Students [odos@purdue.edu](mailto:odos@purdue.edu) is also

available to support you should this situation occur.

## **12.7 Mental Health/Wellness Statement**

If you find yourself beginning to feel some stress, anxiety, and/or feeling slightly overwhelmed: try WellTrack at [purdue.welltrack.com/](http://purdue.welltrack.com/). Sign in and find information and tools at your fingertips, available to you at any time.

If you need support and information about options and resources: please see the Office of the Dean of Students, [purdue.edu/odos](http://purdue.edu/odos), for drop-in hours (M-F, 8 AM-5 PM).

If you find yourself struggling to find a healthy balance between academics, social life, stress, etc: sign up for free one-on-one virtual or in-person sessions with a Purdue Wellness Coach at RecWell. Student coaches can help you navigate through barriers and challenges toward your goals throughout the semester. Sign up is completely free and can be done on BoilerConnect. If you have any questions, please contact Purdue Wellness at [evans240@purdue.edu](mailto:evans240@purdue.edu).

If you're struggling and need mental health services: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help and to speak with a clinician, contact Counseling and Psychological Services (CAPS) at 765-494-6995 or by going to CAPS office on the second floor of the Purdue University Student Health Center (PUSH). For urgent situations after hours, on weekends and holidays, call 765-494-6995 to speak with a clinician. Please see [purdue.edu/caps/](http://purdue.edu/caps/) for further information.

## **12.8 Commercial Note-Taking in Class**

Commercial Note Taking in Classes: Notes taken in class are generally considered to be derivative works of the instructors presentations and materials, and they are thus subject to the instructors copyright in such presentations and materials. No individual is permitted to sell or otherwise barter notes, either to other students or to any commercial concern, for a course without the express written permission of the course instructor. See the Regulations on Student Conduct: Miscellaneous Conduct Regulations.

## **12.9 Major Campus Emergency**

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructors control. Relevant changes to this course will be posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis.

## **12.10 Course and Instructor Evaluations**

During the last two weeks of the semester, you will be provided an opportunity to evaluate this course and your instructor(s) through online course evaluations. On Monday of the 14th week of classes, you will receive an official email from evaluation administrators with a link to the online site. You will have two weeks to complete this evaluation. Your participation in this evaluation is an integral part of this course. Your feedback is vital to improving education at Purdue University. We strongly urge you to participate in the evaluation system.

## **13 Policies on Brightspace**

For information on the following, please consult the Brightspace webpage for the course: student support resources and university policies and statements.