

MA 35100 Elementary Linear Algebra

Fall Semester 2023

updated September 7th 2023

As a Boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do.
Accountable together - we are Purdue.

You are responsible for reading this syllabus in its entirety and following all instructions given.

Course Information

Course Number	MA 35100	
Course Title	Elementary Linear Algebra	
Course Sections	022	021
CRN	64933	23344
Lecture Times	Mondays, Wednesdays and Fridays 11:30am - 12:20pm EST/EDT (WL Campus time)	Mondays, Wednesdays and Fridays 12:30pm - 1:20pm EST/EDT (WL Campus time)
Meeting Location	SCHM 316	UNIV 117
Modality	Face-to-face	Face-to-face
Course Credit	3 credit hours	
Prerequisites	Any of MA 17200, MA 17400, MA 18200, MA 26100, MATH 26100, MA 26300, MA 27100 with a Minimum Grade of C- Not open to students with credit in MA 26500.	

Instructor

Name	Prof. Margaret E. M. Thomas
Instructor's Office	MATH 638 (but see below for office hours info)
Email Address	memthomas at purdue.edu (please use your official Purdue email; email subject MUST include MA35100 and section number or class time)
Office Hours	Mondays 2-3pm, Wednesdays 4:45-5:45pm, Fridays 3-4pm.
Office Hours' Location	MATH 731

Please note: class time will primarily be used to cover **new** material (and review material before exams). To ask questions about class material, assignments or exams, please **attend office hours**.
Please note: It is your responsibility to check your schedule and inform the instructor **by email** within the first week if your schedule is not compatible with any of the above office hour times.

Course Description

Systems of linear equations, finite dimensional vector spaces, matrices, determinants, eigenvalues and eigenvector applications to analytical geometry.

Course Webpages

Official Course Page:

<https://www.math.purdue.edu/academic/courses/semester/202410/ma35100/index.html>

The main website for the course will be the [Brightspace page](#). Course information, materials and announcements will be posted there, including class handouts, lists of assignment problems with accompanying instructions (see **Assessment Methods** below), information about exams, study tips, links to external resources, and announcements about the course. **You will also be expected to check Brightspace, in particular the announcements, regularly.**

Some information (including this syllabus) can also be found on the instructor's website as follows:

https://www.math.purdue.edu/~thoma922/teaching/ma35100/ma35100fs23_022.html

https://www.math.purdue.edu/~thoma922/teaching/ma35100/ma35100fs23_021.html

Textbook

Richard C. Penney, [Linear Algebra: Ideas and Applications](#), 4th Edition (**Please note:** This is **not** the most recent edition of the textbook.)

Access to the textbook is required for weekly assignments (see **Assessment Methods** below). The course will cover the majority of Chapters 1 - 5, excluding sections on “Computational Issues” and “Computer Projects”; it will include some of the sections on applications, depending on time.

An **online version of the book** is *currently* available for **free** through the Purdue Library at [ProQuest](#) (follow the link; click “Log in through your library” at the top; search for Purdue University; select "PURDUE UNIVERSITY LIBRARIES" from the list; log in with Purdue Career Account and BoilerKey). **Please note:** access through ProQuest is controlled by the publisher, not the instructor or Purdue Libraries, so unfortunately access cannot be guaranteed throughout the semester. You are advised to download the e-book to your own device (this copy is meant to remain available to you for a year) as soon as possible, in case online access is removed during the semester (**NB** this has happened before!).

You can also obtain a copy of the book from the [University Bookstore](#), and there are physical copies on reserve at the Department of Mathematics Library (which you can borrow on short loan, by asking the librarian at the desk, and make copies of sections etc. up to fair use copyright restrictions). Second-hand copies may be available from some other retailers or previous students.

Technology

- [Brightspace](#) - for course resources and announcements (including lecture handouts, details of the assignments and exam information); you are expected to check announcements here regularly.
- [Gradescope](#) (course link within Brightspace) - for submission of assignments. (See Brightspace for instructions on using [Gradescope](#), as well as **Assessment Methods** → [Assignments](#) below.)
- [Zoom](#) (meeting links, if they are ever needed, will appear within Brightspace) - not to be used as a rule, but available in case of unexpected developments e.g. if it happens that a class has to pivot online, the expectation is that this would take place on Zoom.

Assessment Methods

Midterm Examinations **Two** (2) written closed-book examinations of 60 minutes duration each.

Final Examination **One** (1) cumulative written closed-book final examination of 2 hours duration (date/time TBA during Finals week).

Assignments **Twelve** (12) written assignments, approximately one per week (see **Schedule** below), consisting of problems from the textbook (see above)

The assigned problems will be posted each week to Brightspace. Answers should be submitted to [Gradescope](#) before the deadlines given in the **Schedule** below.

Please note: do not just look in [Gradescope](#) to find the list of problems set for each assignment, as [Gradescope](#) does not display any extra instructions, hints, or any problems that have been set that are not from the textbook. (This information is however displayed in Brightspace.)

You are allowed (indeed, you are encouraged) to work together with other students on the assignments. You may also use other resources (other than textbook/notes). However, **you MUST write up your own version of the solutions (in your own words)**, and write on your work the **names of any other students** with whom you worked as well as **clear reference to other resources** that you used. **Presenting work that is not your own as though it were your own could result in sanctions and referral to the OSRR** (see also **Academic Integrity** below).

You **MUST** submit your work for each assignment before the deadline listed in the **Schedule** below (unless you have an extension, see below). **Please be careful to start the submission process through [Gradescope](#) early enough so that you can finish submitting by the deadline.**

Gradescope: Basic instructions for using [Gradescope](#) can be found on Brightspace. **Please note:**

- You can submit your work using the [Gradescope Mobile App](#) or the [Gradescope](#) website.
- If you handwrite your solutions on paper, then you should scan them as a **.pdf file** for uploading, e.g. by using the [Gradescope Mobile App](#). If you write your solutions in electronic form (typed or handwritten), then please save them as a **.pdf file** for uploading.
- Please make every effort to ensure that your scans are **readable; in particular, they should be scans and not just photos of your work.**
- You can find the [Gradescope](#) link for this course in Brightspace. Use this to connect to [Gradescope](#) for the first time if you have not used [Gradescope](#) before. (If you have, then you can log in directly to [Gradescope](#), though you might need to wait until the roster is set up before you see the course.)
- If submitting via the [Gradescope](#) website, you are in theory given the choice of submitting a .pdf file or picture files. **Do not submit picture files**, because [Gradescope](#)'s functionalities for grading picture files are more limited, and certain mistakes with submissions cannot be fixed. Please submit a .pdf file, or your work might not be graded in which case you would score 0.
- While submitting your work, you are asked to "assign pages" to all your solutions so that they can be located correctly. **You must do this. This is how the grader will find your solutions to each question.** You might score 0 if you do not do this, as the grader might not be able to locate your solutions, or have time to locate them without this. If you forget to do this or are in a hurry to submit, then you must go back to review your submission as soon as possible in order to assign pages, which you can still do after the deadline.

Late submissions: You may see a "late deadline" listed in [Gradescope](#) as well as the regular deadline. This is there only for technical reasons. If you submit your work after the regular deadline and before the "late deadline", it will be accepted by [Gradescope](#), but stamped as being **late. It will be only be graded at the discretion of the instructor and may incur a late penalty.** If you upload your work to [Gradescope](#) after the regular deadline but before the "late deadline", then you **MUST still email the instructor as soon as possible to give an explanation.**

If you find that you are too late to submit through [Gradescope](#) at all (as opposed to your submission being accepted but marked as "late" by [Gradescope](#), for which see the previous paragraph), then email the instructor your **.pdf** submission (**NOT** picture files) with an explanation; it will be at the instructor's discretion whether or not to accept your submission or to impose a late penalty.

Extensions: Contact the instructor **by email** as early as possible if you would like to request an extension for an assignment. If the extension is granted, arrangements will be made for you to submit via [Gradescope](#) at a different time. (See also policies regarding **Attendance** below.)

Make-Up Exams: You must contact the instructor by email as early as possible if you would like to request to sit an examination at an alternative time due to a clash or an excused absence (see **Attendance** below). It will be at the instructor's discretion how to accommodate such a request.

Course Evaluation

Final grades will be calculated according to the following weighting of the above assessments:

Assignments	25%	(where only the 10 highest scores will be counted)
Midterm Tests	40%	(i.e. 20% for each midterm)
Final Exam	35%	

Students who get at least 97% of the total points in this course are guaranteed an A+, 93% guarantees an A, 90% an A-, 87% a B+, 83% a B, 80% a B-, 77% a C+, 73% a C, 70% a C-, 67% a D+, 63% a D, and 60% a D-; for each of these grades, it's possible that at the end of the semester a somewhat lower percentage will be enough to get that grade.

The instructor reserves the right to adjust this grading scheme at the end of the course; this adjustment will be applied uniformly and in a manner which only increases individual grades.

Schedule

Planned schedule for assignment due dates and examinations:

Assessment	Date	Deadline/Time
Assignment 1	Wednesday August 30 2023	11:59pm EDT
<i>LABOR DAY Monday September 4 2023 (no class)</i>		
Assignment 2	Wednesday September 6 2023	11:59pm EDT
Assignment 3	Wednesday September 13 2023	11:59pm EDT
Assignment 4	Wednesday September 20 2023	11:59pm EDT
Assignment 5	Wednesday September 27 2023	11:59pm EDT
Midterm Exam 1	Tuesday October 3 2023	8-9pm EDT in MATH 175
<i>OCTOBER BREAK Monday October 9 - Tuesday October 10 2023 (no class)</i>		
Assignment 6	Wednesday October 11 2023	11:59pm EDT
Assignment 7	Wednesday October 18 2023	11:59pm EDT
Assignment 8	Wednesday October 25 2023	11:59pm EDT
Assignment 9	Wednesday November 1 2023	11:59pm EDT
Assignment 10	Wednesday November 8 2023	11:59pm EST
Midterm Exam 2	Thursday November 16 2023	8-9pm EST in LILY G126
<i>THANKSGIVING BREAK Wednesday November 22 - Saturday November 25 2023 (no class)</i>		
Assignment 11	Monday November 27 2023	11am EST
Assignment 12	Friday December 1 2023	11:59pm EST
Final Examination	TBA, during Finals week (the week starting Monday December 11 2023)	

Attendance

Students need to inform the instructor of any conflict that can be anticipated and will affect the timely submission of an assignment or the ability to take an examination. Only the instructor can excuse a student from a course requirement or responsibility.

Under academic regulations, excused absences may be granted for cases of grief/bereavement, military service, jury duty, parenting leave, or emergent or urgent care medical care. In such cases, you or your representative should contact or go to the [Office of the Dean of Students](#) website to complete appropriate forms for instructor notification. For details, see the [Academic Regulations & Student Conduct section](#) of the University Catalog website.

In other situations, 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 **in writing, by email**.

For **unanticipated or emergency absences** when advance notification to the instructor is not possible, the student should contact the instructor as soon as possible thereafter **by email**.

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, or by calling 765-494-8778, or by contacting the [Office of the Dean of Students](#). 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 concerning Conduct](#)).

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 instructor's 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.

Commercial Note Taking in Classes

Notes taken in class are generally considered to be "derivative works" of the instructor's presentations and materials, and they are thus subject to the instructor's 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, without the express written permission of the course instructor.** To obtain permission to sell or barter notes, the individual wishing to sell or barter the notes must be registered in the course or must be an approved visitor to the class. Course instructors may choose to grant or not grant such permission at their own discretion, and may require a review of the notes prior to their being sold or bartered. If they do grant such permission, they may revoke it at any time, if they so choose.

See the [Regulations on Student Conduct: Miscellaneous Conduct Regulations: point J](#).

Copyright

See the University Policies and Statements section of Brightspace for guidance on Use of Copyrighted Materials. Effective learning environments provide opportunities for students to reflect, explore new ideas, post opinions openly, and have the freedom to change those opinions over time. Students and instructors are the authors of the works they create in the learning environment. As authors, they own the copyright in their works subject only to the university's right to use those works for educational purposes. Students may not copy, reproduce, or post to any other outlet (e.g., YouTube, Facebook, or other open media sources or websites) any work in which they are not the sole or joint author or have not obtained the permission of the author(s).

Nondiscrimination

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. Purdue's nondiscrimination policy: https://www.purdue.edu/purdue/ea_eou_statement.php

Academic Accommodation of 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 the instructor know so that we can discuss options. You are also encouraged to contact the Disability Resource Center (DRC) at: drc@purdue.edu or by phone: 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>

Such accommodations can only be made if the instructor is informed about them in a timely way. In particular, **requests to take any exam at Purdue Testing Services should follow the requirements of PTS** (e.g. for midterm exams, requests should be made **four days** in advance and, for the final exam, the request should be made by December 1 2023 at 11:55 p.m. EST). When booking an exam with PTS, the booking should be made so that the exam booking *overlaps* with the corresponding exam in the **Schedule** above. If your schedule does not allow you to make such a booking, then you **must** discuss this with the instructor **before** you make the booking request. **If you do not, your booking might be declined.**

Mental Health

If you find yourself beginning to feel some stress, anxiety, and/or feeling slightly overwhelmed, try [WellTrack](#). 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](#). Call 765-494-1747. Hours of operation are M-F, 8am- 5pm.

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 free and can be done on BoilerConnect.

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, such individuals should contact [Counseling and Psychological Services \(CAPS\)](#) at 765-494-6995 during and after hours, on weekends and holidays, or by going to CAPS office on the second floor of the [Purdue University Student Health Center \(PUSH\)](#) during business hours. The [CAPS website](#) also offers resources specific to situations such as COVID-19.

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 a.m.-5 p.m. Monday through Friday.

Major Campus Emergency

In the event of a major campus emergency, course requirements, deadlines, and grading are subject to change that may be necessitated by a revised semester calendar or other circumstances

beyond the instructor's control. Relevant changes to this course will be posted on course websites or can be obtained by contacting the instructor via **email**. You are expected to read your @purdue.edu email on a frequent basis.

A link to Purdue's Information on [Emergency Preparation and Planning](#) is located in Brightspace under "University Policies and Statements." This website covers topics such as Severe Weather Guidance, Emergency Plans, and a place to sign up for the Emergency Warning Notification System. You are encouraged to download and review the [Emergency Preparedness for Classrooms document](#).

The first day of class, the instructor will review the Emergency Preparedness plan for the specific classroom, following Purdue's required [Emergency Preparedness Briefing](#). Please make note of items such as:

- The location to where we will proceed after evacuating the building if we hear a fire alarm.
- The location of our Shelter in Place in the event of a tornado warning.
- The location of our Shelter in Place in the event of an active threat such as a shooting.

Fire Alarm

SCHM: Fountain at John Purdue's grave on Memorial Mall (or in CL50 lobby if weather is inclement).

UNIV: Outside between UNIV and BRNG (or in BRNG lobby if weather is inclement). Building Deputy and Administrative Assistant will conduct a count of personnel.

Shelter in Place Location

SCHM:

Tornado: Take the nearest stairwell, North and South ends of SCHM, to the first floor interior corridor away from glass, kneel facing the wall and cover your head.

Non-weather related: remain in or proceed to the nearest office or classroom, lock and shut the door. Keep all windows shut.

UNIV:

Tornado: Proceed to hallways and interior offices and interior hallways on ground & first floors. However, if there is time, personnel should evacuate to the basement of BRNG Hall.

HAZMAT: Proceed to hallways, and interior offices and interior hallways of all four floors

Active Shooter etc.: Remain in or proceed to office or class rooms and lock the door. All students in hallways must go into an office or class room. All such doors have locks.

If you are directed to shelter in place, but you are unaware of the specific reason, proceed to the lowest level of the building but continue to seek additional information by all possible means to determine the type of incident.

EMERGENCY PREPAREDNESS Lecture

1. Prior to the first day of class, obtain a copy of the [building emergency plan](#) for each building in which you will be teaching. Note the evacuation route and assembly area, as well as the shelter in place locations.
2. On the first day of class, the following information is required to be presented to students:

As we begin this semester I want to take a few minutes and discuss emergency preparedness. Purdue University is a very safe campus and there is a low probability that a serious incident will occur here at Purdue. However, just as we receive a “safety briefing” each time we get on an aircraft, we want to emphasize our emergency procedures for evacuation and shelter in place incidents. Our preparedness will be critical IF an unexpected event occurs!

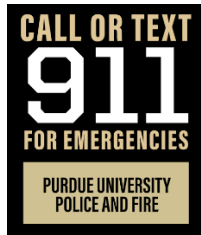
Emergency preparedness is your personal responsibility. Purdue University is actively preparing for natural disasters or human-caused incidents with the ultimate goal of maintaining a safe and secure campus. Let’s review the following procedures:

- For any emergency call or text 911.
- There are nearly 300 Emergency Telephone Systems throughout campus that connect directly to the [Purdue University Police Department](#) (PUPD). If you feel threatened or need help, push the button and you will be connected to the PUPD.
- If we hear a fire alarm we will immediately evacuate the building and proceed to _____(location). **See previous page of this document for details.**
 - **Do not use the elevator.**
 - Go over evacuation route...see specific Building Emergency Plan.
- If we are notified of a Shelter in Place requirement for a tornado warning we will shelter in the lowest level of this building away from windows and doors. Our preferred location is _____ **See previous page of this document for details.**
- If we are notified of a Shelter in Place requirement for an active threat such as a shooting we will shelter in a room that is securable preferably without windows. Our preferred location is _____. **See previous page of this document for details.**
- If we are notified of a Shelter in Place requirement for a hazardous materials release we will shelter in our classroom shutting any open doors and windows. **See previous page of this document for details.**

(NOTE: Each building will have different evacuation & shelter locations. The specific Building Emergency Plan will provide specific locations and procedures). See

http://www.purdue.edu/ehps/emergency_preparedness/emergency/building-plan.html

Attached to the syllabus is an “Emergency Preparedness for Classrooms” sheet that provides additional preparedness information. Please review the sheet and the Emergency Preparedness website for additional emergency preparedness information.



EMERGENCY PREPAREDNESS for Classrooms

EMERGENCY NOTIFICATION PROCEDURES are based on a simple concept – if you hear a fire alarm inside, proceed outside. If you hear a siren outside, proceed inside.

- **Indoor Fire Alarms** mean to stop class or research and immediately evacuate the building.
 - Proceed to your Emergency Assembly Area away from building doors. **Remain outside** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.
- **All Hazards Outdoor Emergency Warning Sirens** mean to immediately seek shelter (Shelter in Place) in a safe location within the closest building.
 - “Shelter in place” means seeking immediate shelter inside a building or University residence. This course of action may need to be taken during a tornado, an active threat such as a shooting or release of hazardous materials in the outside air. Once safely inside, find out more details about the emergency*. **Remain in place** until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave.

**In both cases, you should seek additional clarifying information by all means possible...Purdue Emergency Status page, text message, email alert, TV, radio, etc...review the Purdue Emergency Warning Notification System multi-communication layers at http://www.purdue.edu/ehps/emergency_preparedness/warning-system.html*

EMERGENCY RESPONSE PROCEDURES:

- Review the **Emergency Procedures Guidelines**
https://www.purdue.edu/emergency_preparedness/flipchart/index.html
- Review the **Building Emergency Plan** (available on the Emergency Preparedness website or from the building deputy) for:
 - evacuation routes, exit points, and emergency assembly area
 - when and how to evacuate the building.
 - shelter in place procedures and locations
 - additional building specific procedures and requirements.

EMERGENCY PREPAREDNESS AWARENESS VIDEO

- **"Run. Hide. Fight.®"** is a 6-minute active shooter awareness video that illustrates what to look for and how to prepare and react to this type of incident. See:
https://www.youtube.com/watch?v=5mzl_5aj4Vs

MORE INFORMATION

Reference the Emergency Preparedness web site for additional information:
http://www.purdue.edu/ehps/emergency_preparedness