FLORIDA POLYTECHNIC UNIVERSITY

Welcome to MAS 3105 – Linear Algebra

Linear Algebra is subject that permeates mathematics, physics, engineering, and computer science. It is the mathematics behind data science, AI and machine learning. Understanding the concepts and methods of linear algebra is necessary in almost every STEM discipline. This course introduces all the key definitions of the subject, demonstrates fundamental techniques, explores some of the theory, and looks at several applications. Success in this course requires consistent work, and a willingness to learn the terminology and definitions that drive the subject.

Success in mathematics requires regular attendance and a consistent work ethic. Plan to attend every class. Be on time and ready to engage with your instructor, fellow students, and the material. Taking a serious and professional approach to studying and doing homework is the best way to ensure you meet the learning outcomes for the course. Be familiar with the academic policies outlined in this syllabus and see your instructor with any questions or concerns. We reserve the right to alter any portion of this syllabus throughout the semester to better the course outcomes. Any updates will be announced on our course Canvas page.

Official Email Address

Florida Polytechnic University email is the official method of communication for the University. Students are required to check their email frequently (at least once per day). We cannot reply to any email received from an address other than those that end in floridapoly.edu.

Course Information

- **Course Number and Title**: MAS 3105 Linear Algebra
- **Credit Hours:** 3
- **Academic Term:** Spring 2026

Instructor Information

- **Instructor:** Dr. Michael Brilleslyper
- **Office Location:** IST-2019
- **Office Hours**: TR 1:00 – 2:00PM, W 11:00AM – 12:00PM or by appointment or drop-in (if available)
- **Email address**: mbrilleslyper@floridapoly.edu
- **Meeting Time/Place:** TR 9:30 – 10:45 in BARC 1158

Course Delivery and Course Description

- **Delivery Mode**: Face-to-face.
- **Course Website**: Canvas course site
- **Official Catalog Course Description**: This course stresses the theoretical aspects of the following topics: vector spaces, linear transformations, linear equations and matrices, determinants, inner products, eigenvalues, projections, and least squares.
    - **Course Pre and/or Co-Requisites**: A grade of C in MAC 2313 or MAP 2302
    - **Communication/Computation Skills Requirement (6A-10.030)**: No
- **Required Texts and Materials:**
    - Textbook: Introduction to Linear Algebra 5th Edition by Gilbert Strang, Wessely – Cambridge Press.
    - Supporting Website for the textbook: https://web.mit.edu/18.06/www/
    - MATLAB

Course Objectives and Outcomes

Course Objectives:

Students will gain a practical and theoretical understanding of fundamental principles of linear algebra. Emphasis will be given to learning critical concepts to include independent and dependent vectors, bases, matrices, matrix operations, determinants, matrix factorizations, special matrices, orthogonality, Eigenvalues, Eigenvectors, linear transformations, rank, null space, and a complete understanding of rectangular linear systems of equations.

Course Learning Outcomes:

1. Conceptual Understanding: Students will demonstrate a solid understanding of key concepts in linear algebra, including vectors, matrices, systems of linear equations, eigenvalues, and eigenvectors.

2. Matrix Operations: Students will be proficient in performing fundamental matrix operations, such as addition, subtraction, scalar multiplication, matrix multiplication, and finding the inverse of a matrix.

3. Solving Systems of Equations: Students will be able to solve systems of linear equations using methods such as Gaussian elimination, matrix equations, and inverse matrices.

4. Matrix Factorizations: Students will understand the significance of matrix factorizations, such as LU decomposition, QR decomposition, and eigenvalue decompositions, in revealing the structural properties of a matrix.

5. Vector Spaces and Linear Transformations: Students will comprehend the concept of vector spaces, identify bases and linear independence, and analyze linear transformations, including composition and properties such as kernel and image.

6. Application and Problem-Solving: Students will apply linear algebra concepts to real-world problems, such as linear programming, least squares approximation, cryptography, and network analysis, demonstrating critical thinking and problem-solving skills, including the utilization of matrix factorizations for understanding matrix structures.

Additionally, students will:

7. Use technology, where appropriate, to enhance and facilitate mathematical understanding, as well as an aid in solving problems and presenting solutions.

8. Work collaboratively with peers and instructors to acquire mathematical understanding and to formulate and solve problems and present solutions.

Grading Scale

Grade	A	B+	B	B-	C+	C	D	F
Percentage	90%	87%	83%	80%	77%	70%	60%	< 60%
GPA	4.0	3.33	3.0	2.67	2.33	2.0	1.0	0.0

Assignment/Evaluation Methods

Homework	10%
Project	10%
Exam 1	15%
Exam 2	15%
Exam 3	15%
Exam 4	15%
Final Exam	20%
Total	100%

- **Written homework**: Homework will be assigned regularly. Homework may be assigned from the textbook or provided on handouts. All homework problems will be written up on paper and kept in a well-organized homework notebook. Homework will be due and submitted each exam day. The homework must be clearly labeled and will be reviewed for completeness and organization. Some problems may be checked for accuracy. Some homework problems may require MATLAB for computational reasons. Using AI or other online resources for help in how to use MATLAB is permitted. Using AI or other online resources to complete the homework problems is a violation of academic integrity and is not permitted. All work that you submit must reflect your own work and understanding of the problem. Collaborating with classmates or seeking help from your instructor is permitted. Never submit work that you have directly copied from another source.
- **Project**: A project that explores an application of linear algebra will be assigned during the 2nd half of the course. The format and due date are TBD.
- **Midterm exams**: There will be four exams during class periods on dates indicated on the course calendar. Each exam will count for 15% of your course grade.
- **Comprehensive final exam**: There will be a comprehensive common final exam given per the final exam schedule. Your lowest midterm exam score may be replaced by your final exam score, if that would improve it, up to a maximum of 80%. The final may not be used to replace a missed exam or a score of zero. It may only be used to replace a score for an exam on which you made a legitimate effort.

Attendance

- This course meets two times per week. Every lesson is critical and missing even one class puts you at serious risk of falling too far behind to catch up. Every unexcused absence will result in a course grade **penalty of 2%.**
- Excused absences must be coordinated in advance and approved. Absences due to illness or last-minute emergency will require documentation.

Communication:

Students with a concern or issue should feel free to email their instructor at mbrilleslyper@floridapoly.edu. Instructors will make every reasonable effort to respond by the end of the next class day. If, after sending the instructor a follow-up email, the issue is not resolved, the student may email the department chair, Dr. Mike Brilleslyper at mbrilleslyper@floridapoly.edu. Students may request an appointment with the department chair for further discussion, if needed.

Participation

- Students are expected to participate in the classroom experience.
- The use of earbuds/headphones during class is specifically not allowed and students who engage in this behavior may be asked to leave the class for the day (noting exceptions for authorized accommodations). Do not wear headphones or earbuds during class.

- Persistent problems with participation may result in a code of conduct referral.

Late Work/Make-up work

- Homework is due for review on the day of each exam. Extensions without penalty may be granted on a case-by-case basis. Please communicate with your instructor.
- Make-up exams will be given only in extreme circumstances with a documented excuse. If you will miss an exam because you are participating in a college-sponsored activity, inform your instructor before the exam and provide them with documentation.

Academic Support Resources

- **Library**: Students can access the Florida Polytechnic University Library through the University website and Canvas on and off campus. Students may direct questions to library@floridapoly.edu.
- **Knack Tutoring**: Students looking for additional assistance outside of the classroom are advised to consider working with a peer tutor through Knack. Florida Polytechnic University has partnered with Knack to provide students with access to verified peer tutors who have previously aced this course. To view available tutors, visit floridapoly.joinknack.com and sign in with your student account.
- **Writing Center**: Located on the second floor of the IST (2059/2061), the Writing Center helps students to develop their writing and presentation skills. Consultations are available in person and virtually. For more detail, visit floridapoly.edu/writing center.

Civility and Collegiality

Faculty and students come to the university for the same reason, which is to participate in a highly professional educational environment. To that end, both students and faculty are expected to treat each other with mutual regard and civility. In more general terms, collegiality means respecting the right of both faculty and students to participate fully and fairly in the educational enterprise.

University Policies

Reasonable Accommodations

The University is committed to ensuring equal access to all educational opportunities. The University, through the Office of Disability Services (ODS), facilitates reasonable accommodations for students with disabilities and documented eligibility. It is the student's responsibility to self-identify as a student with disabilities and register with ODS to request accommodations.

If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course through the ODS student portal and communicate with your instructor about your approved accommodations as soon as possible. Arrangements for testing accommodations must be made in advance. Accommodations are not retroactive.
If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible.

The Office of Disability Services (ODS):
DisabilityServices@floridapoly.edu
(863) 874-8770
The Access Point
ODS website: www.floridapoly.edy/disability

Accommodations for Religious Observances, Practices and Beliefs

The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See University Policy.)

Title IX

Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. Resources are available if you or someone you know needs assistance. You may speak to your professor, but your professors have an obligation to report the incident to the Title IX Coordinator. Please know, however, that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University Ombuds Office, BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at Peace River Center, 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment. The Title IX Coordinator is available for any questions to discussion resources and options available.

Academic Integrity

The faculty and administration take academic integrity very seriously. Violations of academic integrity include actions such as cheating, plagiarism, use of unauthorized resources (including but not limited to use of Artificial Intelligence tools), illegal use of intellectual property, and inappropriately aiding other students. Such actions undermine the central mission of the university and negatively impact the value of your Florida Poly degree. Suspected violations will be fully investigated, possibly resulting in an academic integrity hearing and sanctions against the accused student if found in violation. Sanctions range from receiving a zero on the exam or assignment, to expulsion from the university. Repeat offenders are subject to more severe sanctions and penalties.

Recording Lectures

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. Recordings may not be used as a substitute for class participation or class attendance. Recordings may not be published or shared in any way, either intentionally or accidently, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action).

Recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers is ***prohibited****.*

Spring 2026 Calendar

All sections refer to Introduction to Linear Algebra 5th ed. By Gilbert Strang
Schedule is subject to change

	Tuesday	**Thursday**
Jan 12 - 16	1.1, 1.2	1.3, 2.1, 2.2
Jan 19 - 23	2.2, 2.3	2.4, 2.5
Jan 26 -30	2.6, review	**Exam 1**
Feb 2 - 6	3.1, 3.2	3.3
Feb 9 - 13	3.4	3.5
Feb 16 – 20	4.1, review	**Exam 2**
Feb 23 – 27	4.2	4.3
Mar 2 – 6	4.4	5.1, 5.2
Mar 9 – 13	6.1, review	**Exam 3**
Mar 16 – 20	**Spring Break – No Classes**	**Spring Break – No Classes**
Mar 23 – 27	6.1, 6.2	6.2, 6.4
Mar 30 – Apr 3	6.4, 6.5	6.5
Apr 6 – 10	8.1, Review	**Exam 4**
Apr 13 – 17	8.2	9.1, 9.2
Apr 20 – 24	10.3	10.3
Apr 27 – May 1	Open	Reading Day
May 4 – May 8	**Final Exams**	**Final Exams**

Potential Projects
LU decomposition, section 2.6
SVD, section 7.1 – 7.3
Fast Fourier Transform, section 9.3
Network applications, section 10.1