

MA 35300-001-60150

MA 35300-002-60151

GOINS

COURSE SYLLABUS

Course Description. Credit Hours: 3.00. Factoring matrices, orthogonal projections (with application to least squares estimation), diagonalization and Jordan canonical form (with applications to Markov chains and systems of differential equations), Hermitian matrices, convexity (with application to linear programming). Emphasis on problem solving and applications from science, engineering, economics, or business. Not open to students with credit in MA 51100. Typically offered Fall Spring.

Meeting Times. Section 001 (CRN 60150) will meet on Mondays, Wednesdays, and Fridays from 11:30 AM through 12:20 PM in REC 307. Section 002 (CRN 60151) will meet on Mondays, Wednesdays, and Fridays from 10:30 AM through 11:20 AM in REC 307. Office hours will be Thursdays from 10:00 AM through 12:30 PM in MATH 612. There will be a Problem Solving Session from on Thursdays from 8:00 PM through 10:00 PM in REC 112.

Textbook. *Linear Algebra* (4th edition) by Stephen H. Friedberg, Arnold J. Insel, and Lawrence E. Spence. All lecture notes and other course material will be available at the web sites

- <http://www.math.purdue.edu/academic/courses/MA35300/>
- <https://mycourses.purdue.edu>

Homework. There will be a total of 14 Homework Assignments, each worth 100 points. Each will be due at the start of each Friday's lecture. Each should be turned in at the start of class, should be legible, and should be stapled. Late homework will not be accepted. The first assignment will be due Friday, August 26.

Exams. There will be one Midterm Examination as well as one Final Examination. No calculators, notes, or texts will be allowed for use during the exams. The Midterm Exam will take place on Friday, October 14 during class in REC 307. The Final Exam will take place sometime between Monday, December 12 and Saturday December 17.

Grading Policy. Course grades will be determined using the following distributions: the combined 14 Homework Assignments are worth 50% of the total grade (a total of 1400 points), Midterm Examination is worth 25% (700 points), and the Final Examination is 25% (700 points). Grades will be given on a standard scale without curving. For example, those with a weighted average of 90% - 100% will receive between an A- and A+, those with a weighted average between 80% - 89% will receive between a B- and a B+, etc.

Assignment Due Dates.

Assignment	Due Date
Homework Set 1	Friday, August 26
Homework Set 2	Friday, September 2
Homework Set 3	Friday, September 9
Homework Set 4	Friday, September 16
Homework Set 5	Friday, September 23
Homework Set 6	Friday, September 30
Homework Set 7	Friday, October 7
Midterm Exam	Friday, October 14

Assignment	Due Date
Homework Set 8	Friday, October 21
Homework Set 9	Friday, October 28
Homework Set 10	Friday, November 4
Homework Set 11	Friday, November 11
Homework Set 12	Friday, November 18
Homework Set 13	Friday, December 2
Homework Set 14	Friday, December 9
Final Exam	TBA

Instructor Contact Information.

- Office: MATH 612
- Extension: 4-1936
- E-Mail: egoins@math.purdue.edu

Office hours will be Thursdays from 10:00 AM through 12:30 PM in MATH 612.

Important Dates.

September 5	Last day to cancel a course assignment without it appearing on record
September 19	Last day to withdraw a course with a grade of W or to Add/Modify a course with instructor and advisor signature
October 26	Last day to withdraw from a course with a W or WF grade; Last day to Add/Modify a course with instructor, advisor, and Department Head signatures

For more information, see

<https://www.purdue.edu/registrar/calendars/2016-17-Academic-Calendar.html>

Accommodations for Students with Disabilities. If you have been certified by the Disability Resource Center (DRC) as eligible for academic adjustments on exams or quizzes see

<http://www.math.purdue.edu/ada>

for exam and quiz procedures for your mathematics course or go to MATH 242 for paper copies. In the event that you are waiting to be certified by the Disability Resource Center we encourage you to review our procedures prior to being certified. For all in-class accommodations please see your instructors outside class hours before or after class or during office hours to share your Accommodation Memorandum for the current semester and discuss your accommodations as soon as possible.

Online Course Evaluation System. During the last two weeks of the semester, you will be provided an opportunity to evaluate this course and your instructor(s). To this end, Purdue has transitioned to online course evaluations. On Monday of the fifteenth week of classes, you will receive an official email from evaluation administrators with a link to the online evaluation 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.

Campus Emergency Notice. 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. Please refer to the course web pages

- <http://www.math.purdue.edu/academic/courses/MA35300/>
- <https://mycourses.purdue.edu>

to get the information about changes in this course.

Academic Dishonesty. The Mathematics Department, following Purdue Policy, prohibits academic dishonesty. For details about the Purdue Policy on academic dishonesty see

<http://www.purdue.edu/odos/osrr/academicintegritybrochure.php>

Date	Event	Topics Covered
Monday, August 22	Lesson 1	§1.2: Vector Spaces
Wednesday, August 24	Lesson 2	§1.3: Subspaces
Friday, August 26	Lesson 3	§1.4: Linear Combinations and Systems of Linear Equations
Monday, August 29	Lesson 4	§1.5: Linear Dependence and Linear Independence
Wednesday, August 31	Lesson 5	§1.6: Bases
Friday, September 2	Lesson 6	§1.6: Dimension
Monday, September 5	Labor Day	–
Wednesday, September 7	Lesson 7	§1.7: Maximal Linearly Independent Subsets
Friday, September 9	Lesson 8	§2.1: Linear Transformations
Monday, September 12	Lesson 9	§2.1: Null Spaces and Ranges
Wednesday, September 14	Lesson 10	§2.2: The Matrix Representation of a Linear Transformation
Friday, September 16	Lesson 11	§2.3: Composition of Linear Transformations and Matrix Multiplication
Monday, September 19	Lesson 12	§2.4: Invertibility and Isomorphisms
Wednesday, September 21	Lesson 13	§2.5: The Change of Coordinate Matrix
Friday, September 23	Lesson 14	§3.1: Elementary Matrix Operations and Elementary Matrices
Monday, September 26	Lesson 15	§3.2: The Rank of a Matrix
Wednesday, September 28	Lesson 16	§3.2: Matrix Inverses
Friday, September 30	Lesson 17	§3.3: Systems of Linear Equations – Theoretical Aspects
Monday, October 3	Lesson 18	§3.4: Systems of Linear Equations – Computational Aspects
Wednesday, October 5	Lesson 19	§3.4: Systems of Linear Equations – Worked Examples
Friday, October 7	Lesson 20	§4.1: Determinants of Order 2
Monday, October 10	October Break	–
Wednesday, October 12	Midterm Review	Midterm Review
Friday, October 14	Midterm Exam	–

Date	Event	Topics Covered
Monday, October 17	Lesson 21	§4.2: Determinants of Order n , Part I
Wednesday, October 19	Lesson 22	§4.2: Determinants of Order n , Part II
Friday, October 21	Lesson 23	§4.2: Determinants of Order n , Part III
Monday, October 24	Lesson 24	§4.3: Properties of Determinants
Wednesday, October 26	Lesson 25	§4.4: Summary – Important Facts about Determinants
Friday, October 28	Lesson 26	§5.1: Eigenvalues and Eigenvectors, Part I
Monday, October 31	Lesson 27	§5.1: Eigenvalues and Eigenvectors, Part II
Wednesday, November 2	Lesson 28	§5.2: Diagonalizability, Part I
Friday, November 4	Lesson 29	§5.2: Diagonalizability, Part II
Monday, November 7	Lesson 30	§5.3: Matrix Limits, Part I
Wednesday, November 9	Lesson 31	§5.3: Matrix Limits, Part II
Friday, November 11	Lesson 32	§6.1: Inner Products and Norms
Monday, November 14	Lesson 33	§6.2: The Gram-Schmidt Orthogonalization Process and Orthogonal Complements, Part I
Wednesday, November 16	Lesson 34	§6.2: The Gram-Schmidt Orthogonalization Process and Orthogonal Complements, Part II
Friday, November 18	Lesson 35	§6.2: The Gram-Schmidt Orthogonalization Process and Orthogonal Complements, Part III
Monday, November 21	Thanksgiving Break	–
Wednesday, November 23	Thanksgiving Break	–
Friday, November 25	Thanksgiving Break	–
Monday, November 28	Lesson 36	§6.3: The Adjoint of a Linear Operator, Part I
Wednesday, November 30	Lesson 37	§6.3: The Adjoint of a Linear Operator, Part II
Friday, December 2	Lesson 38	§6.3: Least Squares Fitting
Monday, December 5	Lesson 39	§6.4: Normal Operators
Wednesday, December 7	Lesson 40	§6.4: Self-Adjoint Operators
Friday, December 9	Final Exam Review	Final Exam Review
TBA	Final Exam	–