

# ACMS 20620, *Applied Linear Algebra*, Spring 2019

## Course Information and Syllabus

- **Textbook:** Linear Algebra with Applications, ninth edition by Steven J. Leon. ISBN-13: 978-0-321-96221-8, ISBN-10: 0-321-96221-4. Copyright 2015 Pearson Education Inc.
- **Class time and place:**

**Section 2:** MWF 11:30am - 12:20pm, DeBartolo Hall 217 (Lecture).  
**Instructor:** Margaret Regan ([mregan9@nd.edu](mailto:mregan9@nd.edu))  
**Office location:** Crowley Hall 208  
**Office phone:** (574) 634-1639  
**Office hours:** Crowley Hall 202 on Tuesdays 2:00pm - 3:00pm, or by appointment.
- **Teaching Assistants (TAs):** Diana Morales ([dmorale3@nd.edu](mailto:dmorale3@nd.edu)), Alfredo Effendy ([aeffendy@nd.edu](mailto:aeffendy@nd.edu)).
- **Help session office hours hold by the TAs:** Besides office hours held by the course instructors, teaching assistants are holding additional help session office hours every week to help you in this course. You are encouraged to visit TAs' office hours if you need help in your study of this course. **Diana Morales holds help session office hours from 2:00 pm to 4:00 pm on Mondays, and from 9:00 am to 12:00 pm on Fridays. Alfredo Effendy holds help session office hours from 3:30 pm - 5:30 pm on Tuesdays. All help session office hours are held in Crowley Hall 202.**
- **Class website:** <https://www3.nd.edu/~mregan9/> (information in teaching section)
- **Please download MATLAB to your computer from ND OIT website:** <https://oit.nd.edu/services/software/software-downloads/>, for help on downloading MATLAB, contact oit: [oithelp@nd.edu](mailto:oithelp@nd.edu), or (574) 631-8111.
- **Attendance:** Each student is expected to attend every class lecture. Excessive unexplained absence may be reported to the dean's office of the college.
- **Homework Assignments and Collaboration:** Homework problems will be assigned every class and are generally due every Wednesday in class. Homework assignments should be submitted **by the due date and time**. Late homework will not be accepted. You are encouraged to work on problems in groups, but the assignments must be turned in individually. Remember that you will not learn anything by simply copying another student's work. The main purpose of homework is to help you learn the material. Experience shows that students who take their homework seriously do very well in the course because they have a better understanding of the material.
- **Exams:** There will be two midterm exams and the final exam. Midterm exams will be the in-class exams on **Friday, March 1**, and on **Wednesday, April 17**. The final exam will be on **Thursday, May 9, from 4:15pm – 6:15pm**. A student who misses an examination will receive **zero points** for that exam unless he or she has written permission from the Vice president for residential life. If you have a valid excuse (illness, excused athletic absence, etc) for missing an exam, please see your

course instructor ASAP before the exam and a makeup exam will be scheduled.

- **Grades:** Homework 100 points, midterm exams I-II 2 @ 100 = 200 points, final exam 150 points. The total course points are 450. Your final grade will be assigned on the basis of your total score out of 450: **A ≥ 93, A- ≥ 90, B+ ≥ 87, B ≥ 83, B- ≥ 80, C+ ≥ 77, C ≥ 73, C- ≥ 70, D ≥ 60.**
- **Appeal:** All appeals related to homework and exam grades must be submitted within 1 week after they are returned. To appeal, the student must submit to the instructor the following: homework or exam, written or typed note explaining which question(s) is/are being appealed, and the basis for the appeal (e.g., the TA graded to harshly, the question was mistakenly marked incorrectly, etc.). The instructor will review each appeal and make appropriate changes.
- **Honor Code:** Both examinations and homework assignments are conducted under the honor code ([honorcode.nd.edu](http://honorcode.nd.edu)). While cooperation in small groups in doing homework is permitted (and strongly encouraged), copying is not. Exams are to be done completely by yourself with no help from others.
- **Disabilities:** Reasonable accommodations will be made for students who are registered with the Office of Disability Services. Such students should speak with the instructor as soon as possible.

## Syllabus

1. Matrices and Systems of Equations
  - Systems of Linear Equations and Row Echelon Form
  - Matrix Arithmetic and Matrix Algebra
  - Elementary Matrices
  - Introduction of Matlab and Matlab Exercises
2. Determinants
  - Definition
  - Properties of Determinants
  - Matlab Exercises
3. Vector Spaces
  - Definition, Subspaces, Linear Independence
  - Basis and Dimension, Change of Basis, Row Space and Column Space
  - Matlab Exercises
4. Linear Transformations
  - Definition, Matrix Representations
  - Similarity
  - Matlab Exercises
5. Orthogonality
  - Scalar Product, Orthogonal Subspaces, Least Square
  - Inner Product Spaces, Orthonormal Sets
  - Gram-Schmidt Orthogonalization Process
  - Matlab Exercises
6. Eigenvalues
  - Eigenvalues and Eigenvectors, Diagonalization
  - Matlab Exercises