ACMS 20620 - 02, *Applied Linear Algebra*, Fall 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 10:30am - 11:20am, Pasquerilla Center 109 (Lecture).
    Instructor: Yongtao Zhang (*yzhang10@nd.edu*)
    Office location: Hurley Hall 176
    Office phone: (574) 631-6079
    Office hours: Tuesdays, 2:00pm - 3:00pm, or by appointment.

- **Teaching Assistant (TA): Diana Morales** (dmorale3@nd.edu).

- **Help session office hours hold by the TAs:** Besides office hours hold by the course instructor, teaching assistant is holding additional help session office hour every week to help you in this course. You are also encouraged to visit TA's office hour if you need helps in your study of this course. **Diana Morales holds help session office hour from 9:00 am to 11:00 am on Tuesdays. All help session office hours are held in room 202 Crowley Hall.** If you can not make it, you could email the TA and make an appointment for helps.

- **Class website:** ***http://www.nd.edu/~yzhang10/acms20620/index.html***

- **Please download MATLAB to your computer from ND OIT website: https://oit.nd.edu/services/software/software-downloads/, for helps on downloading MATLAB, contact oit: oithelp@nd.edu, or (574) 631-8111.**

- **Homework Assignments:** Homework problems will be assigned in every class and are in general due every Wednesday in class. Homework assignments should be submitted **by the due time**. You are encouraged to work on homework 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 assignments 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, Oct 11,** and on **Monday, Nov 25**. The final exam will be on **Wednesday, Dec 18, from 1:45pm – 3:45pm**. 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.

- **Honor Code:** Both examinations and homework assignments are conducted under the honor code. 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.

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