

# Math 220: Linear Algebra

Winter 2024 in 17-101, M – Th: 11-12:05 pm (Class Number #30730)

## Syllabus

### Instructor Information

- i. Instructor: Dusty Wilson
- ii. Office: 26-306
- iii. Phone: 206-592-3338
- iv. Office Hours:
  - Monday: 8:15-8:50am in 26-306
  - Tuesday: 9:15-10:50am in the MRC and 1:30-2pm in 17-101
  - Wednesday: 8:15-8:50am in 26-306
  - Thursday: Thursday: 9:15-10:50am in the MRC
  - Friday none
- v. home page: <http://people.highline.edu/dwilson>
- vi. e-mail: [dwilson@highline.edu](mailto:dwilson@highline.edu)

### Course Description

Introduction to Linear Algebra: Row operation, matrix algebra; vector spaces, orthogonality, Gram-Schmidt orthogonalization, projections, linear transformations and their matrix representations, rank, similarity; determinants; eigenvalues, eigenvectors, and least squares.

### Student Learning Outcomes

- i. Solve systems using Gauss-Jordan elimination.
- ii. Identify and orthogonalize the basis of a vector space.
- iii. Apply matrix methods to model a data set using least squares regression.
- iv. Calculate and interpret the eigenvalues and eigenvectors of a matrix.
- v. Identify, create, and apply linear transformations using matrix methods.
- vi. Construct a mathematical proof.

### Text

*Linear Algebra and its Applications*, 6<sup>th</sup> ed. by Lay, Lay, and McDonald.

### Prerequisite

Math 152 with a minimum grade of 2.0.

### Calculators

A graphing calculator is required for this course.

- i. The TI-84 calculator is recommended. The use of symbolic calculators may not be allowed during assessments/exams. Furthermore, the use of all calculators may be prohibited during some assessments/exams (forewarning will be given).
- ii. Very limited class time will be spent explaining the use of calculators.
- iii. Calculators may be rented from the Math Department through the Library.

## Canvas

- i. Nothing is submitted through Canvas
- ii. Reminders of when things are due are available through Canvas.
- iii. Grades are available in Canvas.
- iv. Day 1, 2, 3, 4, (and 5) assignments are posted so you know what you should be doing at home and what will happen in class. These will be discontinued after the first week once the pattern is established.

## Homework and Quizzes

Homework and Quizzes will be assigned on MyLabs online. It is important that you use the online resources to learn the material, and not just “get problems right”. Keep an organized notebook of your work, clearly labeling the section and problem number, etc. so you can review your work as it will be helpful on Assessments and in studying for the Final Exam.

- i. You will have five attempts on each/most homework questions.
- ii. Quizzes are timed and short. The questions parallel the homework assignments. You may attempt each quiz three times, but are allowed only one attempt at each question.
  - If you get quiz questions right, you don't need to do that part of the homework.
  - You don't have multiple attempts on quiz questions.

## Projects

- i. There will be three projects assigned during the quarter. The projects are designed to give you a better grasp of the graphs and pictures of linear algebra.
- ii. Some will be individual efforts and others may be worked with a partner.
- iii. If you miss a project, a score of 0% will be assigned.

## Slack Assignments

- i. We will use Slack to communicate, share work, coordinate schedules, and for reminders. Slack is sort of like Discord or GroupMe, but is often used in professional settings which is why I've chosen to use it. Other classes use discussion boards, we are using Slack.
- ii. Slack: There are four channels we will use on Slack.
  - General: This is where I will make announcements and you should ask general questions about the class (i.e., What sections are on the Assessment?).
  - Homework: This is where you will post questions and answers to homework questions.
  - Study groups: This is where you can post about upcoming study groups.
  - Random: You can post about club meetings, off campus gatherings, and fun stuff.
- iii. At least once each week you will make a post on Slack regarding homework. This can be a homework question, homework solution, or a response to a classmate's question.
  - These are graded for completion.
  - There is a 10% bonus if you respond to a classmate's question.
  - Take a screenshot of your response (including your name and date). Save it as a pdf, and upload this into Gradescope.
  - You will be posting homework questions/responses. This is also where I will make announcements and can best be asked questions outside of class.
- iv. Slack assignments will be submitted in Gradescope.
  - One assignment score will be dropped.

### Discussion Seminars

- i. There will be an opportunity to read an article or watch a video related to math, philosophy, history, studenting, etc. You will respond in writing to provided prompts and then discuss the article/video and your writing with your peers.
- ii. Half the credit in this category will be for preparation for the seminar (measured through the electronic submission) and the other half for attendance (measured through bringing printed/typed notes to class).
- iii. One assignment score will be dropped (but not the Letter to a Future Student).
- iv. Discussion Seminar 0 is an outlier and simply exists to help make sure you can interact with the various (and sometimes confusing) technologies we will use in this class.

### Notes/Slack/Discussions submitted via Gradescope

- i. Handwritten work will be submitted (and returned) through a free program called Gradescope. It is similar to uploading into Canvas, but is designed for math/science classes and so easier for me to administer.
- ii. Once each week you will scan your class notes and upload the pdf into Gradescope.
  - These are graded for completion.
  - One score will be dropped.
- iii. Weekly Slack Assignments (explained previously) are submitted via Gradescope.
- iv. Discussion Seminar notes (explained previously) are submitted via Gradescope. These are due before class to encourage you to be prepared for the discussion and also to provide an electronic backup should you forget to bring the printed copy.

### Assessments

There will be (near) weekly assessments:

- i. The assessments will be cumulative, but will emphasize recent material.
- ii. The length/value of the assessments will vary but will typically be about 30 minutes.
- iii. Your lowest assessment score will be dropped if you attend 60%+ of the class days where attendance is taken.
- iv. All assessments must be taken during the scheduled class time.
  - Other arrangements can be made under special circumstances.
- v. Spoken and written communication as well as sharing of calculators during exams is prohibited.

### Final Exam

A comprehensive final exam will be held in the regular class meeting room. See the quarterly class schedule for dates and times. The final exam is mandatory and a grade of 0.0 may be assigned at the instructor's discretion to those who fail to take the final exam.

### Working remotely and illnesses

It is a brave new world where we face new challenges such as Covid-19 while also having many new tools and skills in the areas of teaching and learning:

- i. Attending class in person is a good thing.
- ii. Lessons will generally be available online:
  - For when you are sick and unable to attend class 😞.
  - For when you want to review a lesson 😊.
  - For when you can't (or don't want to) make it to class 😊.
  - For when face-to-face class is cancelled because I am sick or otherwise unable to teach 😞.
- iii. Assessments, exams, and discussion seminars must be attended face-to-face. Plan accordingly. These cannot be completed remotely.<sup>1</sup>
- iv. Because assessments must be completed in person, one score will be dropped if your attendance score is at least 70%. Special circumstances can be addressed on a case-by-case basis.

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<sup>1</sup> Perhaps it goes without saying, that remote options would be available should on campus classes be cancelled. Similarly, please talk to me if you have a prolonged illness (or the like).

**Grading**

- Homework: 4%
- Online quizzes: 4%
- Attendance: 2%
- Slack Assignments: 2%
- Discussion Seminars: 2%
- Class notes: 2%
- Project: 4%
- Assessments: 50%
- Final Exam: 30%.

GPA's will be given according to:

95-100%	4.0	%%	GPA	%%%	GPA	%%	GPA	%%	GPA
93-4%	3.9	81%	3.1	73%	2.3	65%	1.5	57%	0.7
91-2%	3.8	80%	3.0	72%	2.2	64%	1.4	0-56%	0.0
89-90%	3.7	79%	2.9	71%	2.1	63%	1.3		
87-8%	3.6	78%	2.8	70%	2.0	62%	1.2		
85-6%	3.5	77%	2.7	69%	1.9	61%	1.1		
84%	3.4	76%	2.6	68%	1.8	60%	1.0		
83%	3.3	75%	2.5	67%	1.7	59%	0.9		
82%	3.2	74%	2.4	66%	1.6	58%	0.8		

**Policies and Notes**

- i. **Attendance:** You are responsible for all material covered in class including all announced changes to the schedule and assigned course work. (If you miss class, *you* are still responsible for everything in class).
- ii. **Devices:** The use of non-human smart gadgets in class is discouraged (except when requested). Smart non-human devices are banned during assessments and tests.
- iii. **Math Resource Center:** Cost-free mathematics tutoring is available at the MRC. The MRC is located on the sixth floor of the library (Bldg 25).
- iv. **Faculty Advising:** Highline College instructors are a wonderful resource for students at any stage of the academic process. Many Highline instructors have career experience, are knowledgeable about campus resources, and can assist students in reaching their educational goals through degree planning. If you have an advising question, feel free to approach your instructor. If your instructor cannot answer your question, s/he will help you find someone who can.
- v. **Honors:** Highline College offers opportunities for students to participate in an Honors Program tailored to their pathways. Students who fulfill all Honors Program requirements may become eligible for a scholarship during their final quarter and receive recognition at Highline's commencement ceremony.  
If you are interested in the Honors Program, I invite you to pursue an honors project in this class. Please approach me within the first three weeks of the quarter, and we will work together to develop a plan for completing an advanced academic or professional project. After completing the project and earning a 3.5 GPA in this course, an "honors" notation will appear on your official Highline transcript.
- vi. **Academic Dishonesty:** Cheating, plagiarism, and other forms of academic dishonesty are unacceptable at Highline College and may result in lower grades and/or disciplinary action. It is both your right and responsibility to be familiar with the document entitled: Student Rights and Responsibilities code WAC 132I-1210 adopted by the Board of Trustees of Community College District 9 on December 13, 2007. This is available in the counseling center.

- vii. **Access Services:** Your experience in this class is important to me. If you have already established accommodations with Access Services, please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course. If you have not yet established services through Access Services but have a temporary health condition or permanent disability that requires accommodations (conditions include but are not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact Access Services at 206-592-3857, [access@highline.edu](mailto:access@highline.edu) or [access.highline.edu](http://access.highline.edu). Access Services is located on the 5th floor of the Library, Building 25, Room 531.
- viii. **Emergency Procedures:** In the event of an emergency, follow your instructor's directions. If you are told to evacuate the building, take your valuables because you may not be allowed to re-enter. Do not leave campus until your instructor or another campus official tells you to do so. If you may need assistance evacuating, notify your instructor today. To prepare yourself for an emergency, review the evacuation map on the last page of the emergency placard in your classroom and subscribe to HC Alert at <https://hctextalerts.highline.edu/>.
- ix. **Final Exams:** Your completed final exam will not be returned to you. It belongs to the instructor. However, you may (and should) review your final exam by stopping by the instructor's office the next quarter.
- x. **School Policies:**
  - i. **The Student Rights and Responsibilities Code:** A legal document that describes college expectations, students' rights, and outlines the process for resolving disciplinary matters and Code violations. <http://studentservices.highline.edu/srr.php>
  - ii. **The College Catalog:** Lots of fine print about grades, deadlines, and resources can be found in the catalog at: <http://catalog.highline.edu/>
- x. **Important Dates (dates should be verified online):**
  - i. January 12<sup>th</sup>: Last Day for 100% Tuition Refund
  - ii. January 22<sup>nd</sup>: The last day to drop without incurring a "W"
  - iii. February 15<sup>th</sup>: The beginning of registration for Spring Quarter
  - iv. March 1<sup>st</sup>: The last day to officially withdraw with a "W"