Department of Mathematics and Statistics

Linear Algebra
MATH 17311, 48 contact hours, 3 credit hours

5-Week Summer Session

Instructor: TBA
E-mail: TBA
Office Hours: By appointment

Prerequisites: Precalculus(with a minimum grade of C), Calculus I(with a minimum grade of C), or consent of the instructor

Textbook and supplementary materials:
 Linear Algebra and its Applications, 5th edition, by David Lay, Steven Lay, and Judi McDonald.
 Chapter 1-7.
R software package will be introduced.
A scientific calculator that can perform matrix operations will be helpful.

Course description:
 An elementary introduction to finite dimensional vector spaces and matrices. Topics include linear systems,
linear independence, bases, matrix operations, canonical forms, similarity, invertibility, diagonalization, geometric applications, and determinants.

NW Core Description	Course Objectives	Assessment Methods
2C. Critical Thinking Be critical of type of models used to describe a problem, and be able to represent a given problem with an augmented matrix equivalent to an appropriate linear system	1. Model a given situation using Markov Chain. 2. Use matrices to represent linear systems and solve them. 3. Use theorems related to solving linear systems to determine whether a system have solutions.	Quizzes *Class Discussions* Exams

Disclaimer: Course schedule is subject to change and you will be responsible for abiding by any such changes. Your instructor will notify you of any changes.

3C. Managing Information Organize data with the help of technology	1. Use matrices to organize data. 2. Determine which model is more appropriate for a given real world situation.	Quizzes *Class Discussions* Exams
Program Content Demonstrate ability to use tools	1. Find the eigenvalues and eigenvectors for large	Quizzes *Class Discussions*

and technology to support mathematical reasoning and sense making.	matrices and use them to find the spectral decomposition. 2. Reduce a matrices into **rref** forms 3. Find the leas squares line/polynomial/exponential fit and use it for predictions. 4. Manipulate matrices using R	Exams

Instructional methods:

This course will be delivered fully online, and all instructional methods and assessments outlined as follows will be adapted to this format on Canvas. A variety of instructional techniques will be employed, including hands-on participation activities, lectures, discussions, and small group work. Each student is encouraged to read the textbook material to be covered during the class period **before** it is covered in class, as much of the class discussion will be initiated by student questions, and good preparation allows for more in-class time for discussion and problem solving.

Graded course requirements:

Three one-hour exams: 300 points
Comprehensive final   100 points
Quizzes: 100 points

Final exam
Grading scale:

Course grades will be determined by the percent of the total points
        earned.
The percents indicated in the following scale will not be exceeded.

100 - 90%	A
89 - 80%	B
79 - 70%	C
69 - 60%	D
59 - 0%	F

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If the cumulative mean score for the class is below 70%, the above scale could be lowered – provided the mean number of absences is less than the number of examinations given.

Course outline/major topics studied:
Upon completion of this course the student should be able to:

1. Solve systems of linear equations with zero, one, or an infinite number of solutions.
2. Perform operations on matrices and find the inverse of a matrix.
3. Compute the determinant of a square matrix and use it to solve problems such as linear systems
4. Determine whether a set of vectors is a basis for a given vector space and find its dimension.
5. nd linear independence in real vector spaces and apply
6. Describe and use the relationship between linear transformations and matrices.
7. Find the eigenvalues and eigenvectors of a matrix.
8. Diagonalize a symmetric matrix.
9. Describe the conditions under which a given matrix is diagonalizable.

Disclaimer: Course schedule is subject to change with instructor notification and students will be responsible for abiding by these changes.

Attendance: Students are expected to attend all classes as specified in the course syllabi for each course. It is the responsibility of the student to promptly notify his or her instructor when unable to attend class. Please refer to the university policy on attendance at https://www.nwmissouri.edu/policies/academics/Attendance.pdf

Final exams:
If an emergency occurs that prevents the administration of a course scheduled final examination, the final course grades will be calculated based on the work in the course completed to that point in time and the faculty member's considered judgment. Final exams will not be rescheduled, and a grade of "I" will not be given as a result of an institutional cancellation of a final examination. This final exam policy does not apply to online courses.

Administrative drop: An instructor may request the Office of the Registrar delete a student from a course roster if the student has not met the prerequisite for the course as stated in the catalog, *or as a result of non- attendance in the course.*

Academic integrity policy: The students, faculty, and staff at Northwest endeavor to sustain an environment that values honesty in academic work, that acknowledges the authorized aid provided by and intellectual contributions of others, and that enables equitable student evaluation. Please refer to Northwest Missouri State University's Academic Integrity Policy at http://www.nwmissouri.edu/policies/academics/Academic- Integrity.pdf

Non-discrimination and anti-harassment policy: Northwest Missouri State University is committed to maintaining an environment for all faculty, staff, students, and third parties that is free of illegal discrimination

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and harassment. Please refer to the Non-Discrimination and Anti-Harassment Policy at
http://www.nwmissouri.edu/diversity/titlevi.htm

Family Education Rights and Privacy Act (FERPA) policy: Family Educational Rights and Privacy Act of 1974, as amended (commonly known as the Buckley Amendment), is a federal law which provides that colleges and universities will maintain the confidentiality of student education records. Please refer to the Family Educational Rights and Privacy Act (FERPA) Policy at http://www.nwmissouri.edu/policies/academics/Family-Educational-Rights-and-Privacy-Act.pdf

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