COURSE FORMAT	In-Person, CEB 112 TuTh 11:00am–12:20pm
INSTRUCTOR'S INFORMATION	Sungju Moon, PhD **Primary Contact:** Use the Inbox tool within Canvas **Email:** sungju.moon@nevadastate.edu **Office Phone:** (702) 992-2725 **Office Location:** Dawson 223 Please note that all official University communication is conducted using NS-issued email addresses (e.g., @students.nevadastate.edu) in order to comply with the Family Educational Rights and Privacy Act (FERPA). If you need assistance finding or accessing your NSU email account, please see the relevant section on the LASB Course Policies and Guidelines page.
OFFICE HOURS	Tuesdays 1:00–2:00pm, Wednesdays 4:00–5:00pm and whenever my office door is open Online meetings by appointment on Thursdays and Fridays.
E-MAIL & CLASSROOM RESPONSE TIME	You can generally expect a response to e-mails within 24–48 hours (or slightly longer over weekends or holidays). Feedback for completed discussions, quizzes, and assignments depends on the length and complexity of the activity and could take up to 10 days. For questions on the status of a completed assignment, discussion, or test please contact me.
COURSE DESCRIPTION	Introduction to linear algebra, including matrices and linear transformations, eigenvalues and eigenvectors. Some contents in this course will be continued in MATH 389 "Special Topics in Mathematics" in Spring 2026.
REQUIRED TEXT(S)	This course does not require a formal textbook. However, students are encouraged to supplement their learning with the following open textbook: K. Kuttler, *A First Course in Linear Algebra*, Lyryx https://open.umn.edu/opentextbooks/textbooks/213
SUPPLEMENTAL MATERIALS	Certain assignments will require having access to Octave or MATLAB. MATLAB (MATrix LABoratory) is built around efficient handling of matrices with syntax designed for intuitive implementation of linear algebra operations. Octave is a free and redistributable alternative to MATLAB. The following options are available: • You can download GNU Octave available at https://octave.org/. • Octave Online can be accessed through your web browser: https://octave-online.net/ If you run into any trouble installing GNU Octave on your personal computer, please don't hesitate to let the instructor know right away so we can get you set up smoothly. You are welcome to use a different tool (e.g., Python, R) if you prefer; however, in-class demonstrations will be mainly conducted in Octave/MATLAB.

Course Learning Outcomes

After finishing this course, you will be able to:

- perform computations involving matrices including Gauss–Jordan elimination, matrix multiplication, computation of determinants, and finding eigenvalues and eigenvectors of a matrix.
- explain the theoretical underpinnings of linear algebra that make possible the computations using the language of vector spaces.
- recognize real-life situations where the knowledge of linear algebra is applicable and sketch out or implement simple applications.
- build familiarity with the mathematical way of thinking and writing by engaging with definitions, theorems, proofs, and applications.
- gain an understanding of how pure mathematics fields are structured, with linear algebra as an example. Explore equivalence classes and mappings between them, as seen in concepts like change-of-coordinate matrices and transformations.

Program Learning Outcomes

This course aligns with the following mathematics Program Learning Outcomes.

Program Learning Outcomes (PLO)	**Course Assignment or Activity**	**Level of Attainment**
PLO 1 (Perspective: Fundamental Concepts) Describe the fundamental concepts of and the relationships between the major areas of mathematics.	At some point in the second half of the semester, students will complete an activity consisting of a common prompt asking them to write about the fundamental concepts and connections between the major areas of mathematics.	1. 1 area 2. 2 areas 3. 4 areas 4. 6 or more areas
PLO 2 (Perspective: Applications) Demonstrate an understanding of how the major areas of mathematics can be applied to contextual problems.	At some point in the course, students will complete an activity prompting them to describe a contextual problem that can be addressed using the tools, concepts, or techniques from this course.	1. The problem is inappropriate for the course content. 2. The problem is appropriate for the course content, but it is contrived or is very poorly explained. 3. The problem is appropriate for the course content, there is a direct connection between the problem and the content, and that connection is explaiend using general/non-specific language. 4. The problem is appropriate for the course content, and there is a direct connection between the problem and the content, and that connection is explained in a manner that reflects a technical understanding of the actual application.
PLO 6 (Personal Development: Communication) Communicate their ideas to others with the appropriate level of rigor and clarity for the audience.	Project 1 will require students to write a paper to communicate their network modeling project to their peers.	1. The core ideas are communicated either incorrectly or incoherently. 2. The core ideas are communicated, but the presentation is unclear. 3. The core ideas are communicated clearly, but not at the appropriate level for the audience. 4. The core ideas are communicated clearly at the appropriate level for the audience.
PLO 7 (Personal Development: Collaboration) Work in groups to move collaboratively towards a shared goal.	Project 2 (See also, the "Collaboration" document distributed via LMS)	1. The student indicates negative outcomes within the group context. 2. The student indicates neutral outcomes within the group context. 3. The student indicates the ability to identify positive collaborative outcomes within the group context. 4. The student indicates significant levels of positive collaboration outcomes in the group context.

Class Schedule

See Page 8 of the course syllabus for the tentative course calendar.
All dates are subject to change.

Assignment Description & Due Dates

Problem Sets (30%): Problem sets will be assigned on a quasi-weekly basis. Solutions must show every step and be written as if explaining to a peer. Assignments are typically due within one week, with due dates announced at the time of posting.

Two problems from each set will be randomly selected for grading and feedback. We will adopt standard-based grading for the problem sets. Each problem will be worth 3 points—1 point for completion, 1 point for accuracy, and 1 point for exposition. If you did not earn full credit, you may meet with the instructor within the two-week window of the assignment return to explain your approach and potentially earn some points back; availability is not guaranteed.

While collaboration with classmates is encouraged, each student must submit their own work. Completed assignments may be submitted electronically if typed, or as physical copies if handwritten. Scans or photographs of handwritten work will not be accepted.

Projects (30%; 10% each): Three project assignments will be completed during the semester. These projects will require the use of scientific computing software such as Octave or MATLAB, with Octave coding introduced in class. Each submission must include a written report along with the accompanying source code. Students are encouraged to work in groups of 2–3, with only one report required per group. Every submission must include a short statement outlining each member's role and contribution.

Participation (15%): Active participation is a vital component of this course. Participation will be assessed through regular self-evaluation, relfection essays and individual midterm debrief meeting. At the start of the semester, you will create a study plan specifying times, locations, and goals for your out-of-class study. Using the Self-Evaluation form, you will regularly reflect on your engagement in and out of class as well as your progress on the study plan. These reflections will form the basis of an individual meeting shortly after the midterm exam.

Quizzes (5%): Weekly online quizzes will be posted after each Thursday class and must be completed by the end of the day. A brief period may be set aside at the end of class to begin the quiz. Each quiz will consist of two questions: (1) the statement of a definition or theorem, and (2) an example or explanation illustrating it. Mathematical expressions may be written using Canvas's inline system (based on LaTeX) or MATLAB notation. While you may consult your notes, you are encouraged to first attempt the problems independently to maximize your learning outcomes. Seeking answers online is strongly discouraged, as outside sources can introduce unnecessary confusion due to differences in conventions, levels of rigor, or underlying axiomatic systems.

Exam Description

Exams (20%): There will be two examinations, a midterm and a final. Tentative dates are provided in the course schedule (Page 8).

Notetaker's Advantage. You may earn up to 1% extra credit on each exam by sharing your review notes. Review notes must be submitted for review at least one week prior to the exam date and, if accepted, will be shared anonymously with the class on the day of the exam. The instructor may request multiple revisions before your notes are fully accepted.

Exam Debrief. Schedule an individual meeting with the instructor to pick up your graded midterm and discuss how the class is going for you. Opportunities for exam corrections may be made available during these meetings.

Late Work Policy

If for some reason you are absent due to an extenuating circumstance or medical situation, please report the incident using the Student Absence Notification System. Instructors will then review the information in the SANS to determine how, or whether it's possible, to address missed or late work.

The following assignments may *not* be turned in late for credit without explicit permission from the instructor:

- Problem Sets
- Quizzes
- Projects
- Exams

You cannot receive a passing grade for the course without completing all major assessments, which include exams and projects.

Attendance Expectations

There may be days you do not to attend classes or leave early due to past or ongoing crises or distressing circumstances. Disclosure of specific reasons or details is not expected, but it will be helpful if you could communicate with me about instances of missed sessions or work; this is because (1) frequent or prolonged inactivity with regard to course contents will negatively impact your learning, and (2) open communication will help us reformulate missed assignments to suit your situation. Missing five consecutive class sessions or assignments without prior or follow-up notice will prompt me to check in with you for a 'pulse check'. Please know that I am available to provide resources and connect you to support services.

Grading Criteria

Your grade will be determined by the following rubric:
(Course Point Totals)—100%

- Problem Sets (30%)
- Projects (30%; 10% each)
- Exams (20%)
- Participation (15%)
- Quizzes (5%)

Grading Scale (Letter Grade and Point Range):

A	93% or higher	B-	80%–82.99%	D+	67%–69.99%
A-	90%–92.99%	C+	77%–79.99%	D	63%–66.99%
B+	87%–89.99%	C	73%–76.99%	D-	60%–62.99%
B	83%–86.99%	C-	70%–72.99%	F	less than 60%

Accessing Grades and Instructor Feedback

To access your grades and find the instructor's feedback, click on Grades in the left menu. Scroll through the list until you find the new graded assignment (indicated by the blue dot to the left of the assignment name). Then click on the assignment name. You will see your grade. Below it you can click on Show Rubric to see the marked up rubric. Click on the paper title if you want to download the original document. (The instructor's marks or comments will not appear on the downloaded document.) Click on the box to the right of the paper title to see the Turnitin report. Click on View Feedback to see the paper marked up with the instructor's comments/corrections in DocViewer. The instructor's feedback is on the right. Accessing Grades will take you step-by-step through how to find all instructor feedback and see the marked-up paper and rubric.

Artificial Intelligence (AI) Policy

What Is AI? AI tools are applications and other generative technologies capable of producing content (e.g., generating, summarizing), offering feedback (e.g., revising, translating), researching, assisting with coding, or other tasks typically done by humans. Examples include, but are not limited to, ChatGPT, Grammarly, Bing Copilot, Google Gemini, Grok, Answers.AI, Quillbot, Claude AI, DeepL, DeepAI, DALL-E, etc.

AI Tools Banned on State-Owned Devices. The State of Nevada has banned (link) some AI tools (and other technology) due to security or intellectual property concerns. You cannot use these tools on University-owned computers or other devices:

- Grammarly (public version)
- DeepSeek AI

The State updates the banned technology list occasionally, so other tools may be added. You are responsible for checking the most updated list to ensure you are not using any banned tools on state-owned devices.

AI Use Policy for This Course.

- *Prohibited Uses.* As a student in this course, you are not allowed to use AI assignments in the following ways:
  - Generating full essays, reflections, or academic papers
  - Generating answers for homework assignments or quiz problems
  - Generating plots and graphs for assignments and projects
  - Submitting wholly AI-generated programming code

- *Permitted Uses.* You are allowed to use AI in the following ways:
  - Checking grammar and spelling
  - Tutoring or study help (e.g., generating example questions)
  - Generating artificial data to be used in mini-projects (with AI attribution)
  - Research assistance or finding sources
  - Brainstorming or outlining ideas for papers or projects (with AI attribution)
  - Converting from one programming language to another for testing purposes (with AI attribution)
  - Generating visualizations for your own use (not for submission)

If you are unsure how AI can be used for a specific assignment, talk to the instructor before you get started.

AI Citation. This class does not require a specific citation style. The example below, in AMS style, may be used for AI attribution:

> [1] OpenAI ChatGPT-version chat response to prompt "Your prompt goes here," 2025.
>
> In text citation example: "...according to ChatGPT [1]..."

Consequences for Misuse. Misuse of AI may result in plagiarism or academic misconduct penalties outlined in the NS Student Code of Conduct and/or the LASB Academic Conduct Policy (found under Resources & Policies). Continued misuse of AI in coursework or across courses will result in escalating consequences based on the severity and frequency of the violation, which could include receiving an F in this course, academic probation, suspension, or expulsion.

LASB Course Policies & Guidelines

All courses in the School of Liberal Arts, Sciences, and Business (LASB) are subject to LASB course policies and guidelines. You are responsible for reading, understanding, and abiding by these policies and guidelines.

Student Support & Resources

Academic Advising Center. The Academic Advising Center is a dedicated team of Advisors committed to your academic success at NS. By providing the right advice and guidance, we helps students meet their educational and personal objectives. Please visit Academic Advising Center.

Writing Center. Supporting every NS student's ability to improve their process and product, the Writing Center provides trained readers for all writers, all projects, in all disciplines, and during all stages.

Academic Success Center (Tutoring). The Academic Success Center (ASC) offers a range of services including free one-on-one and group tutoring sessions where students can review and practice course concepts and relevant study/test taking strategies with trained peer tutors.

NetTutor Online Tutoring—Did you know you can receive a free on-demand academic support at your convenience when the ASC is closed? You can submit a question or request a drop-in session for a specific subject with an e-instructor. The majority of NetTutor e-instructors have a Master's or Ph.D. in the field. You can access NetTutor through Canvas by selecting the "NetTutor Online Tutoring" on the left-side navigation bar in each of your courses.

Scorpion Success Network. If the instructor determines your performance in this class is placing you at academic risk, you may be referred to a member of the Academic Advising Center. An Academic Advisor will work with you to address issues and develop a student success strategy. Regardless of whether a referral has or has not been made, you are ultimately responsible for tracking your own progress in this course. If you would like to meet with an Advisor regarding any academic struggles you are experiencing, please contact Academic Advising at 702-992-2160 or at studentsuccess@nevadastate.edu.

Student Wellness Services. If you are struggling with hunger, unstable housing, safety, mental health worries, or ANY other concerns, contact Student Wellness. Email: studentwellness@nevadastate.edu | Call (702) 992-2514.

Disability Resources. At Nevada State University, we recognize our responsibility and embrace the opportunity to meet the unique educational needs of students with documented disabilities. The staff of the Disability Resource Center (DRC) is dedicated to providing a coordinated program of support services for students qualifying with disabilities under the Americans with Disabilities Act (ADA) and Section 504 Guidelines. Our mission is to ensure that all students qualifying with disabilities have equal access to participate in, contribute to, and benefit from all university programs, classes and activities.

Confidential, sensitive, and individualized services are provided free of charge, on a case-by-case basis.

Any student who believes s/he may need accommodations, based on the impact of a documented disability, should contact the DRC Office to speak privately with the Director of the DRC about specific needs. To make an appointment, please contact the DRC office at (702) 992-2180 or by email at drc@nevadastate.edu.

Veteran Concerns. If you are a veteran who is struggling academically or have concerns please contact the DRC office at (702) 992-2180 or by email at drc@nevadastate.edu.

Course Schedule

All Dates are Subject to Change

Date	Agenda	Quiz	Assigned	Due
Tue, Aug 26	Introduction; System of Linear Equations			
Thu, Aug 28	Gaussian Elimination	Quiz 0		
Tue, Sep 2	Vector Eqns. & Matrix Eqns.	PS 1		
Thu, Sep 4	$\mathbb{R}^n$, Linear Combination., Span.	Quiz 1		
Tue, Sep 9	TFAE Thm, Matrix Eqn.			
Thu, Sep 11	Application: Network Analysis	Quiz 2	Proj 1	PS 1
Tue, Sep 16	Linear Independence		PS 2	
Thu, Sep 18	Linear Transformations	Quiz 3		PS 2
Tue, Sep 23	Linear Transformations, Matrices Basics			Proj 1 Draft
Thu, Sep 25	Matrices (cont.)	Quiz 4	PS 3	
Tue, Sep 30	Inverse Matrices			
Thu, Oct 2	Block Matrices	Quiz 5		PS 3
Tue, Oct 7	Application: Computer Graphics		Proj 2	Proj 1 Final
Thu, Oct 9	Determinants I (Computation)	Quiz 6	PS 4	
Tue, Oct 14	Determinants II (Properties, Cramer Rule)			
Thu, Oct 16	Midterm Problem Solving Session			PS 4
Tue, Oct 21	Midterm Exam			
Thu, Oct 23	Abstract Vector Spaces			Proj 2 Draft
Tue, Oct 28	Span, Linear Independence, Bases			
Thu, Oct 30	Bases and Coordinate Systems	Quiz 7	PS 5	
Tue, Nov 4	Inner Product, Orthogonality			Proj 2 Final
Thu, Nov 6	Projections, Gram–Schmidt Process	Quiz 8	PS 6	PS 5
Tue, Nov 11	Veteran's Day			
Thu, Nov 13	Least Squares	Quiz 9	Proj 3	PS 6
Tue, Nov 18	Spectral Theory I			Midterm debrief
Thu, Nov 20	Spectral Theory II	Quiz 10	PS 7	
Tue, Nov 25	Spectral Theory III			Proj 3 Draft
Thu, Nov 27	Thanksgiving			PS 7 (early)
Tue, Dec 2	Spectral Theory IV			PS 7
Thu, Dec 4	Final Problem Solving Session			
Tue, Dec 9	Final Exam			Proj 3 Final