MATH 329: Intermediate Linear Algebra   Fall 2024, 3 credits

INSTRUCTOR	Artem Novozhilov
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WEB	https://www.ndsu.edu/pubweb/~novozhil/ https://www.ndsu.edu/pubweb/~novozhil/Teaching/math329.html
LECTURE HOURS	MWF 8:00am–8:50am, NDSU Morrill Hall, Rm 109
OFFICE HOURS	MWF 11:00am–12:00pm (or by appointment)
TEXTBOOK	Lecture notes will be provided. A recommended (optional) textbook is *Linear Algebra Done Wrong* by Sergei Treil. The book pdf can be found at https://www.math.brown.edu/~treil/papers/LADW/LADW.html
PREREQUISITES	MATH 129 and MATH 165
COURSE DESCRIPTION	Vector spaces over real and complex numbers, matrices, determinants, linear transformations, eigenvalues and eigenvectors, Cayley–Hamilton theorem, inner product spaces, selected topics and applications.
COURSE OBJECTIVES	Upon completion of the course the student will be proficient with the language and the main results of linear algebra, which is arguably *the* most important course in all undergraduate mathematics. The secondary course objective is to facilitate the transition of the students from the computationally oriented introductory mathematical courses to the upper level undergraduate math courses, which require significantly more abstract thinking and ability to prove mathematical statements. An introductory linear algebra course, which is a prerequisite for this course, is devoted mainly to the computational aspects of solving systems of linear equations. As an abstract mathematical discipline, linear algebra studies linear operators acting on vector spaces. One of our goals in this course is to see how abstract concepts help clarity and understand deeper computational procedures. A significant attention will be paid to the logical structure and technique of various proofs, and all (well, almost) facts in this course will be proved.
CLASS ATTENDANCE	According to NDSU Policy 333 (www.ndsu.edu/fileadmin/policy/333.pdf), attendance in classes is expected. The students are solely responsible for missed handouts or announcements made during the lectures.
HOMEWORK	Starting week two of the course there will be a regular weekly homework, which will be collected and graded. No late homework will be accepted. Group work on homework problems is encouraged, however, the final writing of solutions should be entirely your own.
QUIZZES	Except for the weeks with exams, there will be a quiz once a week covering the material from the previous week's lectures. There will be no make-up for the quizzes, and the lowest result will be dropped before the final grading.

EXAMS	There will be three midterm in-class exams, and one final two hour long comprehensive exam (December 19, Thursday, 1pm). A standard 8 1/2 by 11 sheet of paper with student's notes (both sides) is allowed for the final exam only. The midterm exams are closed books.
CALCULATORS	Calculators will not be allowed during the tests and exams.
GRADING	The grading of the course will be based on the grade throughout the semester [weekly homework (20%), quizzes (20%), midterm exams (10% each), and the final exam (30%)] or on the final exam grade alone, whichever turns out to be bigger. The final grade will be A/B/C/D/F with the thresholds 90/80/70/60.
ACADEMIC RESPONSIBILITY AND CONDUCT	The academic community is operated on the basis of honesty, integrity, and fair play. NDSU Policy 335: Code of Academic Responsibility and Conduct applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the Office of Registration and Records. Informational resources about academic honesty for students and instructional staff members can be found at www.ndsu.edu/academichonesty.
	Any student found guilty of academic dishonesty will receive a grade of 0 for the homework assignment, or quiz, or test, or exam in question. In addition, every such student will be reported to the Chair of Mathematics, the Dean of their major college, the Dean of the College of Science and Mathematics, the Provost, and the Registrar. The Registrar will add any such student to NDSU's Student Academic Misconduct Database. (Multiple entries in this database may result in additional sanctions from NDSU.)
SPECIAL NEEDS	Any students with disabilities or other special needs, who need special accommodations in this course, are invited to share these concerns or requests with the instructor and contact the Disability Services Office (www.ndsu.edu/disabilityservices) as soon as possible.
SCHEDULE	*Note:* This is a tentative schedule and subject to a change.

Weeks 1-2. Systems of linear equations. Operations on matrices.

Weeks 3-4. Determinants. First midterm exam (tentatively, September 20th).

Weeks 5-7. Proof techniques. Vector spaces.

Weeks 8-9. Linear transformations. Second midterm exam (tentatively, October 25th).

Weeks 10-11. Intro to spectral theory.

Weeks 12-13. Inner product spaces. Third midterm exam (tentatively, November 22th).

Weeks 14-16. Structure of linear operators in inner product spaces. Review classes.

Week 17. Final exam (December 19, Thursday, 1pm).