

MA305 INTRODUCTORY LINEAR ALGEBRA AND MATRICES

Spring 2019

Instructor: Elyse Rogers	Time: Tu,Th 8:30am - 9:45am
Email: esrogers@ncsu.edu	Place: Park Shops 210

Course Page: <https://wolfware.ncsu.edu/courses/my-wolfware/>

Office Location: LB 202 **Office Hours:** Tuesday, Thursday 10am-11am or by appointment.

Optional Text: Elementary Linear Algebra with Applications, by Richard Hill. Third Edition. 1996

Objectives: This course will cover the following topics:

1. Matrix and Vector Multiplication
2. Solving systems of equations using Gauss-Jordan elimination
3. Finding the determinant of a matrix
4. Solving a system of equations using Cramer's Rule
5. Calculating the inverse of a matrix
6. Finding the volume of an object using the determinant
7. LU Decomposition
8. Cholesky Decomposition
9. QR Decomposition
10. Calculating the Eigenvectors and Eigenvalues of a matrix
11. Eigen Decomposition
12. Singular Value Decomposition (SVD)
13. Finding the best approximate solution to an overconstrained system
14. Finding the smallest solution to an underconstrained system
15. Image Compression using SVD
16. Watermarking using SVD
17. Null Space and Row Space of a matrix

Course Information and Prerequisites: MA305 is a 3-credit hour course. MA241 is a prerequisite for this course. Credit is not allowed for both MA305 and MA405. The homework problems for this class are not graded but are a great way to study for the tests and to make sure that you understand the material that is discussed in class. You can find these problems on the Moodle page for this course. I suggest you complete these in a timely manner after each class in order to prepare for the next lecture. Please make sure that you understand these problems and the other examples and proofs from class before each test.

Grading Policy: Attendance (5%), Midterm 1 (20%), Midterm 2 (20%), Midterm 3 (20%), Final (35%).

- There will be 3 midterms given throughout the semester, each will be 1 hr 15 mins.
- Attendance will be recorded for every class, except for test days. Seats will be assigned by the TA on Tuesday January 15. The TA will check attendance every class so please ensure that you are in the correct seat. If you have an official, documented excuse as to why you were unable to attend class, then please contact the instructor or the TA with your documentation and we can give you an excused absence. Neither the instructor nor the TA will provide extra help on lectures that have been missed, unless in the case of a documented excuse.
- A make-up test will be given only in the case of a documented, excused absence. Please contact me within 24 hours of a missed test to schedule a make-up.

Important Dates:

Midterm #1	Tuesday February 5 2019
Midterm #2	Thursday March 7 2019
Midterm #3	Tuesday April 16 2019
Final Exam	Tuesday April 30 2019

Course Policy:

- Regular attendance is essential and expected.
- Graphing calculators with a matrix function can be used in Midterm 2, Midterm 3 and the Final Exam. These calculators are prohibited in Midterm 1 as I will be testing your ability to perform simple matrix functions by hand. Even though graphing calculators can be used in later tests, please be sure to show all of your work in tests so that we may see that you understand the problem.
- Please turn in 3 small Blue Books and 1 large Blue book by Tuesday January 22.
- Check your email often. Many announcements will be made or reiterated via email. You can reach me by email with any questions that you may have concerning the material throughout the week, however I may not respond immediately in the evenings after 5pm or on weekends so please take this into account when asking last minute questions for homeworks or tests.
- Be accountable for your own education. You are responsible for resolving confusion about assignments, due dates, exam dates, accommodations, etc.
- Do not submit work that is not yours. It is understood that your name or signature on any assignment indicates your adherence to the NC State Honor Pledge: **"I have neither given nor received unauthorized aid on this test or assignment."**

Disability Services: Reasonable accommodations will be made for students with verifiable disabilities. To receive accommodations, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 919-515-7653. Please see the Academic Accommodations for Students with Disabilities Regulations (REG02.20.1). You must discuss accommodations with me prior to a test date.