

## EECE 212 Linear Algebra and Engineering Programming

### Spring 2023

This is a flipped class; students are required to watch lecture videos before the in-class session.

<b>Location Time</b>	<ul style="list-style-type: none"> <li>• Lecture: T and R, 2:50 – 4:15 pm, UU209</li> <li>• Programming Labs: T, R, and two sessions on F</li> </ul>
<b>Instructor</b>	<ul style="list-style-type: none"> <li>• Ziang Zhang, Associate Professor, Email: <a href="mailto:ziang.zhang@binghamton.edu">ziang.zhang@binghamton.edu</a> Office Hours: M and W 4 – 5 pm <ul style="list-style-type: none"> <li>○ In-person: ES 2317</li> </ul> </li> </ul>
<b>TAs</b>	<ul style="list-style-type: none"> <li>• TAs (check the next page for office hours): <ul style="list-style-type: none"> <li>○ Olya Noruz Shamsian, <a href="mailto:onoruzs1@binghamton.edu">onoruzs1@binghamton.edu</a></li> <li>○ Mohammad Ali Dashtaki, <a href="mailto:mdashta1@binghamton.edu">mdashta1@binghamton.edu</a></li> </ul> </li> </ul>
<b>UCAs</b>	<ul style="list-style-type: none"> <li>• UCAs (check the next page for lab support details): <ul style="list-style-type: none"> <li>○ Maximo Rodriguez, <a href="mailto:mrodri99@binghamton.edu">mrodri99@binghamton.edu</a></li> <li>○ Kirill Kobayakov, <a href="mailto:kkobayak2@binghamton.edu">kkobayak2@binghamton.edu</a></li> </ul> </li> </ul>
<b>Textbooks and Course Website:</b>	<ul style="list-style-type: none"> <li>• Introduction to Linear Algebra   Edition: 5 (Required) <ul style="list-style-type: none"> <li>○ Author: Gilbert Strang</li> <li>○ ISBN: 978-09802327-7-6</li> </ul> </li> <li>• MATLAB online help <ul style="list-style-type: none"> <li>○ <a href="https://www.mathworks.com/help/matlab/linear-algebra.html">https://www.mathworks.com/help/matlab/linear-algebra.html</a></li> </ul> </li> <li>• MATLAB Mathematics functions: <ul style="list-style-type: none"> <li>○ <a href="https://www.mathworks.com/help/matlab/mathematics.html">https://www.mathworks.com/help/matlab/mathematics.html</a></li> </ul> </li> <li>• The class website will be on Brightspace, where announcements, course materials, etc., will be posted.</li> </ul>
<b>Prerequisite</b>	Calculus I
<b>Objective:</b>	Linear algebra topics include matrix operations, systems of linear equations, determinants, the solution to matrix equations, vector space, eigenvalues, and eigenvectors. Introduction to Matlab programming includes programming variables and arrays, matrix operation, functions, data representation, user-defined functions, and a brief introduction to graphical programming. Engineering applications, such as the matrix representation of graphs, and matrices applied to electric circuits and linear systems, will be introduced during the class.
<b>Grading:</b>	<ul style="list-style-type: none"> <li>• In-class quizzes: 8%</li> <li>• Homework: 12%, Lab reports: 30%, Class project: 10% <ul style="list-style-type: none"> <li>○ Late submission received within two days after the original due: 20% off</li> <li>○ Late submission received after two days after the original due: 0 point</li> </ul> </li> <li>• Exam: #1: 20%, Exam: #2: 20%</li> </ul>
<b>Additional Readings</b>	<ul style="list-style-type: none"> <li>• MIT 18.06: <a href="http://ocw.mit.edu/courses/mathematics/18-06-linear-algebra-spring-2010/">http://ocw.mit.edu/courses/mathematics/18-06-linear-algebra-spring-2010/</a></li> <li>• Stanford EE 103: <a href="http://stanford.edu/class/ee103/">http://stanford.edu/class/ee103/</a></li> </ul>

**Tentative Schedule and which TA (name after assignment) will grade what**

<b>Week #</b>	<b>Lecture</b>	<b>HW &amp; Exam</b>	<b>Lab &amp; Project</b>
1	Introduction	No class on Thu	Lab 1 Matlab onramp
2	Vectors and Matrices	HW1 (Mohammad)	Lab 2 Matlab onramp (Olya)
3(Feb)	Solving Linear Equations		Lab 3 Plot (Mohammad)
4	Elimination Matrices	HW2 (Olya)	Lab 4 Matlab Functions (Olya)
5	LU Factorization		Lab 5 Loops (Mohammad)
6	Vector Spaces	HW3 (Mohammad)	Lab 6 Linear Algebra Function (Olya)
7(Mar)	Reduced Echelon Form	No class on Thu	
8	Solving $Ax=b$	HW4 (Olya)	Lab 7 Work with Image (Mohammad)
9	The Four Subspaces		Lab 8 Solving $Ax=b$ (Olya)
10	Least Squares	HW5 (Mohammad)	Lab 9 Dynamic Systems (Mohammad)
11(Apr)	Spring Break		
12	Determinants	Exam 1	Lab 10 Least Squares (Olya)
13	Eigenvalues & Eigenvectors		Project start
14	Diagonalization	HW6 (Olya)	
15	Engineering applications		Project due (Mohammad)
16(May)	SVD		
	Exam Week	Exam 2	

**Lab Session Support and TA office hours**

<b>Lab sessions:</b>	<b>In-person</b>
A50: Tu, 10:05 – 11:45am, AA G002	TA: Olya, UCA: Maximo
A51: Th, 10:05 – 11:45am, AA G002	TA: Olya, UCA: Kirill
A52: Fr, 2:20 – 4:00 pm, LN G102	TA: Mohammad (Available after 2:30 pm), UCA: Maximo (Available after 3 pm)
A53: Fr, 4:10 – 5:50 pm, LN G103	TA: Mohammad, UCA: Kirill

## Health Concerns

If you become ill or are asked to go into quarantine/isolation, you should immediately notify the instructor and following instructions from health providers and/or health authorities. Further information on COVID-19 symptoms and next steps are available here: [Health](#). Students who exhibit symptoms should call the [Decker Student Health Services Center](#) at 607-777-2221 first.

## Academic Integrity

All students must adhere to the Student Academic Honesty Code of the University and the Watson School (below). The Department of Electrical and Computer Engineering has adopted a standard policy to enforce these codes for violations involving course work. Category I violations result in a grade of 0 for the graded work plus a one letter course grade reduction. A *Report of Category I Academic Dishonesty* form is filed with the Provost's Office; if a prior report is already on file, the offense is automatically elevated to Category II. Category II violations result in at least a failing grade for the course plus any additional penalties determined by the Watson Academic Integrity Committee.

Full details of the University Academic Honesty Code are available in the [University Bulletin](#) under "Academic Policies and Procedures for All Students". The Watson School Academic honesty policy can be found at <http://www.binghamton.edu/watson/about/fast-facts/academic-honesty.html>

## Course Workload

This course is a 4-credit course, which means that students are expected to do at least 12.5 hours of course-related work each week during the semester. This includes scheduled lectures/discussions, completing assigned readings, participating in lab sessions, studying for tests and examinations, preparing written assignments, completing internship or clinical placement requirements, and other tasks that must be completed to earn credit in the course.

## ITS Helpdesk/myCourses Support

Walk-in: Located in the Computer Center first floor lobby.

Call: 607-777-6420; E-mail: [helpdesk@binghamton.edu](mailto:helpdesk@binghamton.edu).

<https://www.binghamton.edu/its/>

## Students in Distress

If you are experiencing undue personal or academic stress at any time during the semester or need to talk with someone about a personal problem or situation, you are encouraged to seek support as soon as possible. Course instructors are available to talk with you about stresses related to your work in your courses. Additionally, the campus has a wide range of resources, including:

- Dean of Students Office: 607-777-2804
- Decker Student Health Services Center: 607-777-2221
- University Police: On campus emergency, 911

- University Counseling Center: 607-777-2772

### **Contact the Electrical and Computer Engineering Department**

- Chair - Douglas Summerville: [dsummer@binghamton.edu](mailto:dsummer@binghamton.edu)
- Graduate Program Director - Vladimir Nikulin: [vnikulin@binghamton.edu](mailto:vnikulin@binghamton.edu)
- General Information - [ecestaff@binghamton.edu](mailto:ecestaff@binghamton.edu)
- Graduate Secretary - Lynn Callahan: [lcallaha@binghamton.edu](mailto:lcallaha@binghamton.edu)
- More Department Contacts: <https://www.binghamton.edu/electrical-computer-engineering/about/contact.html>