

**MTH 237-60:
Linear algebra**

MTWR 2:45 - 4:45p

RM 2901 Martin campus

May 25 - June 28 2016

<http://www.douglasweathers.com/mth237sscc>

Instructor information

Name: Douglas Weathers
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Student hours: T 1:30p in the library

Course description

Prerequisite: A working knowledge of vector operations, exemplified by a grade of C or better in Calculus II.

Algebra is much more than solving real-number equations for x . Rather, it is the study of **structure**: the way the rules of a system influence its behavior, *e.g.* the fact that addition, multiplication, and exponentiation of real numbers can all be inverted allows us to solve aforementioned equations. Linear algebra, the study of the structure of **vector spaces**, generalizes these ideas for the first time. You will see the first but by no means last appearance of **structure-preserving maps** between mathematical objects. These will be understood by means of **matrices** looked at from both the concrete point of view—**systems of equations, row reduction, determinants**—and the abstract point of view—**linear independence, linear transformations, bases, eigenvectors** and **eigenvalues**.

Student assessment

You will be assessed through weekly homework, a midterm exam, and a final. Reminder: a C represents that you made expectations; a B, that you made them well; an A, that you knocked my socks off doing so.

Homework	Midterm	Final
40%	30%	30%

Five extra credit points will be awarded throughout the course. An extra credit point is **not** equivalent to a point on your final grade. Rather, extra credit will be scored such that you if you do all of it, you will make a B in the course if you make a 80 on the final exam. *i.e.* if you have a 70 for the course, then an 80 on the final would bring you up to a 73. The five extra credit points would be worth 7 points, so each extra credit point would be worth 1.4 points on your total grade.

Attendance

This is a month-long summer course. If you choose not to attend, may your gods show you mercy.

Textbook

I am using *Linear algebra with applications - Alternate edition (Eighth edition)* by Gareth Williams. You are recommended to do so as well to do ungraded practice work. Additionally, I will post notes to the website as we go.

Octave	Octave is an open source knock-off of the much more expensive MATLAB software. Both are used extensively to work with large matrices. Though you are expected to gain some familiarity with computing matrix operations by hand, I would like to teach you to use the software as well. We will you use a cloud Octave IDE at http://www.octave.im .
Tutors & accommodations	Shelton State Community College is dedicated to the success of its students. To further that goal, free tutoring is available to all currently enrolled students. If you need additional assistance to succeed, contact Annette Cook at acook@sheltonstate.edu . If you need accommodations in order to be successful, contact Michele Minor at m.minor@sheltonstate.edu or visit her in the Office of Specialized Student Services.
Emergency preparedness & sexual conduct	Shelton State Community College continues to be committed to a safe teaching and learning environment for students and employees. In an effort to further strengthen efforts at keeping the College Community free from weapon related violence and to eradicate sexual misconduct crimes and infractions, SSCC has recently enacted the following policies that address these areas specifically. Sexual misconduct is an often underreported crime and victims should be aware that SSCC has a confidential process in place for reporting such actions and for helping victims identify resources for assistance. Links to these policies and other important emergency preparedness related topics may be found on the college website: http://www.sheltonstate.edu/discover_sccc/emergency_preparedness.aspx .
EEOC statement	The College does not discriminate on the basis of race, color, national origin, sex, disability, or age in its admissions, programs, and services in compliance with Title VI and VII of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, Title IX of the Educational Amendments of 1972, and the Americans with Disabilities Act of 1990. - See more at: http://www.sheltonstate.edu/discover_sccc/eoc_statement.aspx#sthash.sd9bNrt0.dpuf
Academic misconduct	Students are expected to be honorable in all college assignments. Suspected cases of academic misconduct are reported to the Dean of Academic or Technical Services.
Standard college policies	The college catalog and website detail standard college policies for all teaching and learning activities. This class syllabus is intended to give further detail about the policies and expectations in this class. Students are expected to be aware of and abide by College policies in every class.

MTH 237 calendar

Subject to change. Particularly, we may use the review days to catch up.

Date	Topic	Supplemental reading
	Part I: The concrete point of view	Course notes available at the website.
W 5/25	Systems of linear equations, Gauss-Jordan elimination	W 1.1, 1.2, notes
R 5/26	GNU Octave, applications of linear systems	W 1.3, notes
M 5/30	Memorial Day (no class)	The inside of your eyelids
T 5/31	Matrix algebra (HW1 due): addition, multiplication, transpose, etc.	W 2.1 - 2.4, notes
W 6/01	Interlude: Communication systems	W 2.7
R 6/02	Matrix algebra continued: inverses, etc.	W 2.4, notes
M 6/06	Determinants (HW2 due)	W 3.1, notes
T 6/07	Application of the determinant to linear systems	W 3.2, notes
W 6/08	Review for the midterm	
R 6/09	Midterm exam	Midterm exam review guide
	Part II: The abstract point of view	
M 6/13	Three-dimensional space and quadratic functions	
T 6/14	Vector spaces (60% refund)	W 4.1, notes
W 6/15	Subspaces	W 4.4, notes
R 6/16	Linear independence, basis, dimension	W 4.5 - 4.7, notes
M 6/20	Linear transformations (HW3 due)	W 6.2 - 6.4, notes
T 6/21	Coordinatization (Last day to drop)	W 6.6, 6.7, notes
W 6/22	Rank-nullity theorem	W 6.3, notes
R 6/23	Diagonalization	W 5.1, 5.3, notes
M 6/27	Final exam review (HW4 due)	
T 6/28	Final exam	Cumulative final review guide

Getting to know you

Name

E-mail address (that you check regularly!)

Major

Why that major?

Are there any topics or applications you'd like me to cover?

What else should I know about you? (*e.g.* preferred first name, preferred pronouns, preferred version of the song "Such Great Heights" and if you don't say Streetlight Manifesto's version you're wrong)