

Topics in Linear Algebra (CRN: 13625)
Fall 2021
MATH 478.60 (3 credits), TDB, Wickersham 203-1

Instructor: Dr. Buchanan

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Office Hours: 2:00P-3:00P (M.W.F), 1:00P-2:00P (Tu.Th) or by appointment

Email: Robert.Buchanan@millersville.edu (preferred)

Office hours will be held in Wickersham 203. Students and visitors must wear a mask. If you prefer to meet through Zoom videoconferencing, please use the link:

<https://millersville.zoom.us/j/9583054013> Meeting ID: 958 305 4013

Textbook: *When Life is Linear: From Computer Graphics to Bracketology*, Tim Chartier, The Mathematical Association of America, Washington, DC, 2015, ISBN: 978-0-88385-649-9 (print), 978-0-88385-988-9 (electronic)

Objectives: MATH 478 *Topics in Linear Algebra* will explore some of the current applications of linear algebra to data science, machine learning, image and graphics processing, search algorithms, sports.

Course Contents: Topics covered in this course will include the following from the textbook.

- Review of matrix and vector operations from linear algebra
- Applications of the norm to clustering and image recognition
- Applications of matrix multiplication to computer graphics
- Applications of linear algebra to cryptography
- The singular value decomposition (SVD) and its applications
- Page rank algorithms for searches
- Applications of eigenvalues/eigenvectors
- Applications to ranking sports teams

Since this course will frequently require students to work with data and carry out matrix/vector operations on large data sets, the software *Mathematica* will be introduced. Students may also use software such as Matlab or Octave if they so choose.

Attendance: Students are expected to attend all class meetings per the [University Approved Guidelines](#).

If you know beforehand that you will be absent from class on the day an assignment is due, you must complete and hand in the assignment prior to the absence. If you are unexpectedly absent the day that an assignment is due you must hand in the assignment at the beginning of the class hour on the first day that you return to class. If you know you will be absent on the day of a test, you must notify me before the time the test is scheduled in order to schedule a make-up test. Students who miss a test should provide a valid excuse, otherwise you will not be allowed to make up the test. No final exam exemptions.

Mask Policy: All people present in the classroom, hallways, or office are required to wear face coverings.

This policy applies to both vaccinated and un-vaccinated individuals. If you forget to wear a mask to class or office hours you must leave and return wearing a mask in order to be admitted.

Homework: Students are expected to do their homework and participate in class. Students should expect to spend a minimum of three hours outside of class on homework and review for every hour spent in class. Homework exercises help students review and reinforce concepts covered in class. All assigned homework exercises must be worked until successful completion.

Grades: Course grade will be calculated as follows.

Homework	80%
Project	20%

I keep a record of students' test, homework, and exam scores. Students should also keep a record of graded assignments, tests, and other materials.

The course letter grade will be assigned as follows. I will not "curve" course grades.

90-92	A-	93-100	A		
80-82	B-	83-86	B	87-89	B+
70-72	C-	73-76	C	77-79	C+
60-62	D-	63-66	D	67-69	D+
		0-59	F		

Course Repeat Policy An undergraduate student may not take an undergraduate course of record more than [three times](#). A course of record is defined as a course in which a student receives a grade of A, B, C, D, (including + and -) F, U, Z or W. The academic department offering a course may drop a student from a course if the student attempts to take a course more than three times.

The last day to withdraw from a course (and receive the W grade) is October 29, 2021 at 4:30P. Course withdrawals are submitted online.

Inclement Weather Policy: If we should miss a class day due to a school [delay](#) or [cancellation](#), any activities planned for that missed day will take place the next time the class meets. For example, if a test is scheduled for a day that class is canceled on account of snow, the test will be given the next time the class meets.

Cell Phones: Silence (or better yet, turn off) all cellular telephones upon entering the classroom. Leaving class to initiate or receive a telephone call will not be tolerated and students doing so will not be re-admitted to the classroom until the following class meeting. Texting or tweeting during class interferes with the learning process. Students distracted by their cell phones are not engaged in class and will find, over the course of the semester, that learning and course grade will suffer.

Title IX Reporting Responsibilities: Millersville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to comply with the requirements of Title IX of the Education Amendments of 1972 and the University's commitment to offering supportive measures in accordance with the new regulations issued under Title IX, the University requires faculty members to report to the University's Title IX Coordinator incidents of sexual violence shared by students. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report to the person designated in the [University Protection of Minors policy](#) sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred.

Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at: www.millersville.edu/titleix

Final Word: Mathematics is not a spectator sport. What you learn from this course and your final grade depend mainly on the amount of work you put forth. Daily contact with the material through homework assignments and review of notes taken during lectures is extremely important. Organizing and conducting regular study sessions with other students in this class will help you to understand the material better.

No one can guarantee you success in this course. Your responsibilities and the instructor's expectation are outlined above. There will be no second chances, "do-overs", or extra credit assignments.