

MA301 Spring 2015: Intro. to Linear Algebra Syllabus

MA301.01: 9:00 MWF: 004 KH
MA301.02: 10:00 MWF: 004 KH
MA301.03: 2:00 MWF: 305 KH

Dr. Lisa Oberbroeckling (o-burr-brek-ling)

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Class webpage: <http://math.loyola.edu/~loberbro/ma301/index.html>

WeBWorK: <http://math.loyola.edu/webwork2/ma301s15/>

Other information found on Moodle.

Office Hours

Monday	Tuesday	Wednesday	Thursday	Friday
11-12	—	11-12	—	11-12

Also by appointment (see my schedule).

NOTE: I realize that my office hours may conflict with your schedule. I'm around many other times than just my office hours so feel free to stop by or make an appointment. You can also email me with questions, but please be patient for my response.



I reserve the right to make changes to the syllabus at any time during the term by announcing them in class and on the webpage. You are responsible for knowing what was discussed/announced in class but also posted on Moodle/class website.

Prerequisites: MA252 (Calculus II).

Course Description: An introduction to the basics of matrices, linear transformations, and vector spaces along with selected applications. Topics include linear independence, dimension, solutions of linear systems, eigenvalues, and diagonalization. Applications are drawn from areas such as computer graphics, input-output analysis, and least squares. The computer package MATLAB is introduced and used throughout the course.

Text: Required: *Intro. to Linear Algebra, 4th edition* by Gilbert Strang.

Calculators: A graphing calculator is not required. Although most graphing calculators have the ability to work with matrices, it can be cumbersome. Instead, we will learn to use MATLAB.

Grading:

Based on:

WeBWorK 15%
Projects 15%
2 Exams 20% & 23%
 (higher exam is worth 23%)
Final exam 27%

Basic Scale

A 90-100% I give +/- grades, the cutoffs being at the
B 80-89% 7's and 3's, respectively.
C 70-79% Thus 80-82.9 = B-, 83-86.9 = B, and
D 60-69% 87-89.9 = B+.
F 0-59%

Extra Credit: Do not count on extra credit in this course to boost your grade. I make it a policy to not give extra credit on an individual basis so do not ask for it, especially at the end of the semester.

Homework and WeBWork: This course will emphasize problem solving and some applications of mathematics. Homework problems from the text will be assigned and posted on the homework web-page. Also, you will be asked to do online homework through WeBWork. *The WeBWork counts towards your grade. Even though I will not be collecting the homework assigned from the text, it is important for you to be able to do all of the problems and understand the concepts behind them.*

Projects: There will be 3-4 projects throughout the term that will involve writing and/or the use of the computer using MATLAB. The specific directions for each project will be handed out in class when each project is assigned. Although some of you may have used MATLAB before, **PRIOR KNOWLEDGE OF MATLAB IS NEITHER NEEDED NOR ASSUMED.** Many of the projects will expose you to applications of linear algebra that will not be covered during class lectures.

Late Assignments: Late WeBWork assignments are not accepted, so plan your time wisely. Late Projects are accepted but 3 points (out of 15) will be deducted automatically.

Exams: There will be 2 in-class exams during the term. They are tentatively scheduled on Wednesday, February 18 and Wednesday, March 25. Other information about the exams will be announced in class the week before each exam.

Final Exam: Final exams are cumulative. Specific information will be given later as the end of the semester nears.

MA301.01 (9:00 class): FIXED **Friday, May 1 at 9 AM.**

MA301.02 (10:00 class): FIXED **Wednesday, April 29 at 9 AM.**

MA301.03 (2:00 class): **Saturday, May 2 at 9 AM.**

Attendance Policy: I do not take attendance every day, but I do pay attention to who shows up. If you must miss class, I don't need to hear why because it is your responsibility to find out what you missed. It is best to get notes from a classmate; my lecture notes will not be useful to you. If you cannot make it to an exam because of illness or family emergency, let me know **in advance** by phone or e-mail. Make-ups will be given only under these circumstances. Don't abuse this. No changes can be made to the dates and times of the final exams.

Classroom Etiquette: When you come to class, I expect you to not only be in attendance physically but also mentally. That means no cell phones, no leaving class during lecture, no extraneous chatter, etc. If you know you must leave class, sit by the door to minimize the disruption.

Honor Code: All students of the University are expected to understand the meaning of the Loyola University Honor Code. Ignorance of the Code is not a valid reason for committing an act of academic dishonesty. The following constitute violations of the Code and are defined in the Community Standards Handbook: cheating, stealing, lying, forgery, plagiarism and the failure to report a violation.

I expect you to work with others outside of class (by collaborating, not copying!). I will ask you to sign a pledge on exams but not on other turned-in work although I will expect the same honesty on all of them. Any questions or concerns should be directed immediately to me.

Student Athletes: If you are a student athlete, please provide me with your travel schedule indicating when you will need to miss class to participate in athletic events. While travel for athletics is an excused absence, you will need to make up any missed work. Please remind me before you are going to miss a class. Absences only on the travel letter will be accommodated.

Students with Disabilities: To request academic accommodations due to a disability, please contact Disability Support Services (DSS), Newman Towers West 107, at DSS@loyola.edu or call 410-617-2750/2062. If you already registered with DSS and requested an accommodations letter (and DSS has sent the letter to your professors via email), please schedule a brief meeting to discuss the accommodations you might need in this class. Please contact Marcia Wiedefeld, Director of DSS, if you have any questions at mwiedefeld@loyola.edu or 410-617-2062.

Learning Outcomes: At the end of the term, if a student successfully completes the course, s/he will have achieved:

the following Undergraduate Learning Aims of the University:

- Intellectual Excellence
 - appreciation of and passion for intellectual endeavor and the life of the mind
 - appreciation of and grounding in the liberal arts and sciences
 - excellence in a discipline, including understanding of the relationship between one's discipline and other disciplines; understanding the interconnectedness of all knowledge
 - habits of intellectual curiosity, honesty, humility, and persistence
- Critical Understanding: Thinking, Reading, and Analyzing
 - the ability to evaluate a claim based on documentation, plausibility, and logical coherence
 - the ability to analyze and solve problems using appropriate tools
 - the ability to use mathematical concepts and procedures competently, and to evaluate claims made in numeric terms
 - the ability to use information technology in research and problem solving, with an appreciation of its advantages and limitations
- Eloquentia Perfecta: the ability to use speech and writing effectively, logically, gracefully, persuasively, and responsibly
- Diversity: recognition of the inherent value and dignity of each person, and therefore an awareness of, sensitivity toward, and respect for the differences of race, gender, ethnicity, national origin, culture, sexual orientation, religion, age, and disabilities

the following Natural and Mathematical Sciences learning aims:

- develop their innate curiosity about the natural world and take a life-long interest in science news and advancements
- explore one or more of the central ideas that form the foundation for modern science
- understand the process of science - its methodology, how questions are framed, how data are acquired, how arguments are constructed and conclusions reached . In this context, students should learn what science is not and have the ability to recognize and reject pseudoscientific claims. In addition, students should also have the ability to recognize the limits of science. Students also should understand the relationship between science and technology and how the results of scientific discovery can be applied to the needs of society. Students should learn the linkage between experimental methodology and scientific content

- learn to reason mathematically, and to think critically and analytically through statistical or mathematical methods. Because of the close interrelationship between science and math, in each science course in the core, students will achieve a better understanding of the power of quantitative tools used in the particular discipline
- learn how recent technological advances have facilitated and accelerated scientific inquiry. They gain a realistic understanding of the potential and limitations of computation

and the following learning goals of the course:

- be able to solve a system of linear equations,
- be able to demonstrate an understanding of the concepts of linear independence and linear dependence,
- be able to find the eigenvalues and corresponding eigenvectors of a matrix, and
- be able to demonstrate an understanding of matrix and vector algebra.

GENERAL SUGGESTIONS:

- This course will test your study and time management skills. The **projects and homework/WeBWork exercises WILL be time consuming** until you get the hang of them, so DO NOT put off the homework until the night before they are due. I cannot and will not give extensions on these due dates.
- Don't use the fact that I don't collect the book homework to blow it off. You will need to know that material for the exams and later material!
- Participate in class, ASK QUESTIONS, **stop by my office**. If you get behind or stuck, see me or work with other students RIGHT AWAY.
- This course will be much more enjoyable if you form a study group with others in the class. You may work together but everyone must join in and work.
- READ THE BOOK. Lectures will be much more understandable. It will be important to READ the book, not just look at the highlighted boxes because I will not be able to cover all of the details or show nearly enough examples in class.
- If you think you'll need extra help, get it as soon as possible. Do not wait until right before an exam! There are tutoring services available – most are FREE.