

MATH 151: Engineering Math I
Texas A&M, Fall 2013
Lecture: M,W,F, 11:30 am-12:20 am, Heldenfels Hall 113

Instructor: Dr. Adam Larios **Email:** alarios@math.tamu.edu
Office: Blocker Building, 641 C **Math Dept. Phone:** (979) 845-3261
Office Hours: M,W,F, 9:00 am - 10:00 am, or by appointment

Teaching Assistant: Fulvio Gesmundo **Email:** fulges@math.tamu.edu
Office: Milner Hall, 201A

Labs:

Section: 513, CRN: 12308
T 2:20 pm - 3:10 pm, Blocker Building 122
R 2:20 pm - 3:10 pm, L. F. Petersen Building 113

Section: 514, CRN: 12309
T 3:55 pm - 4:45 pm, Blocker Building 123
R 3:55 pm - 4:45 pm, Blocker Building 148

Section: 515, CRN: 12310
T 5:00 pm - 5:50 pm, Blocker Building 126
R 5:00 pm - 5:50 pm, Civil Engineering Building 136

Course Description: This course provides students with quantitative and problem-solving skills of 2-dimensional vectors and differential calculus. At the conclusion of the course, students should be able to:

- know and use techniques of differentiation,
- apply techniques of differentiation to a variety of applications, including engineering applications,
- understand and apply vector operations in 2-dimensions, including the dot product,
- understand the relationship between derivatives and integrals via the Fundamental Theorem of Calculus, and
- use computer algebra systems, such as MATLAB, to solve non-routine problems.

Textbooks: *Calculus: Early Vectors* by James Stewart (1999). ISBN: 978-0470767856.
All Math 151 classes use this book. You have already purchased an electronic copy of it (an eBook) through course fees. Buying a paper copy is optional. Buying the solutions manual is optional, but maybe useful in order to view detailed solutions of the odd numbered suggested homework problems.

MATLAB: An Introduction with Applications, 4th Edition by Amos Gilat (2010).
This book will be used in the computer laboratory.

Contacting me: The best way to get in contact with me is by email, alarios@math.tamu.edu. **Please put [MATH 151] in the title and make sure to include your whole name with your email.** Polite, courteous emails are appreciated; see my website for tips on email etiquette. My office is in the Blocker Building, 641 C, and my office hours are M,W,F 9:00 am - 10:00 am. Drop-ins are welcome during these times. If you want to meet me at a different time, please email me, and we will try to schedule a time to meet.

Common Exams: Engineering Mathematics I and II use “common exams” in order to establish consistency among sections. These common exams are administered in the evening (schedule attached). If you have a class conflict with these exams, you must provide documentation reasonably far in advance, and arrangements will be made for you.

Matlab: Once per week (see the attached schedule for assigned days), students will attend a Matlab workshop. During the first 15-20 minutes of Matlab, students will have a quiz on the previous activity. Notes and calculators are not permitted on the quizzes. This will encourage students to actively participate on the activity and learn the material before the following Matlab. After the quiz, students can work on the assigned Matlab or ask the TA homework questions. Visit the following link for Matlab assignments.

<http://www.math.tamu.edu/courses/math151/matlabsched.html>

Homework: Homework is designed to help students understand the material and to prepare them for the exams. Homework is handled online through WebAssign, Online homework (WebAssign) is required in all Math 151 classes. For each homework, a ‘practice’ will be available. Students are highly encouraged to work the (non-graded) practice homework before working the associated ‘graded homework’. Do not wait until last minute to complete the online homework! Information on WebAssign can be found at:

<http://www.math.tamu/eHomework>.

Collaboration: Collaboration on assignments is encouraged in this course. However, copying someone else’s work and submitting it as your own is unacceptable. This act of academic dishonesty will be prosecuted in accordance with University policy.

Lab Work: The labs provide help in programming and problem solving.

Calculators: There will be no calculators (or other electronic devices) allowed on exams and quizzes, unless otherwise stated.

Laptops, Cell Phones, etc.: Laptops, cell phones, and other electronic devices, are not allowed to be used during class, unless otherwise stated. Cell phones must be set on vibrate or off. If you need to take a call, send a text message, or something similar, please quietly leave the classroom to do so, so that you do not distract other students. You are welcome to return to class quietly when you are finished. If you wish to take notes using an electronic device, you must first demonstrate to me that you can type or write fast enough to do so properly, and that you can do it without distracting others, before the privilege to use such devices may be granted. If you are found to be abusing this privilege, you risk forfeiting it.

Grading: The final course grade will be computed as follows.

Recitation Activities:	5%
Matlab:	5%
WebAssign Homework:	5%
Quizzes:	10%
Midterm Exams:	50%
Final Exam:	25%

Your *minimum* grade will be A, B, C, D, or F for averages equal to or above 90%, 80%, 70%, 60%, or 0%, respectively. Contacting me about final grades before they are due will only slow down the process of grading, so please be patient.

- Class Etiquette:** During class I will stay focused on teaching you mathematics, so please stay focused on learning the mathematics being taught. This means you should stay awake throughout the class, you should not be reading a newspaper or materials from another course, you should refrain from discussion not related to class and you should not leave class early unless you have cleared it with me first. If I feel you are being disruptive or disrespectful during class, you may be asked to leave. You should never have a cell phone out or turned on during class. If I hear or see your cell phone out, I may ask you to leave the classroom and you will therefore not be able to complete any in-class assignments.
- Attendance:** **Daily attendance for class lectures is expected and is extremely important.** While attendance is not recorded, missing even one class will put you behind. Note that there is a strong correlation between class absences and poor grades. You are responsible for all material and announcements in class regardless of whether or not you attended. **You are also responsible for making arrangements with another classmate to find out what you missed. You should not ask me to go over material that you missed (due to tardiness or absences) during office hours or over email.**
- Incompletes:** A grade of “incomplete” may be considered if all but a small portion of the class has been successfully completed, but the student in question is prevented from completing the course by a severe, unexpected, and documented event. Incomplete grades will be handled in accordance with university policy. Students who are simply behind in their work should consider dropping the course.
- Make-up Policy:** No make-ups will be given without written evidence of an official University excused absence. (See University Student Rules.) According to Section 7.3 of the University Student Rules, for an absence “to be considered excused, the student must notify his or her instructor in writing (acknowledged e-mail message is acceptable) prior to the date of absence if such notification is feasible. In cases where advance notification is not feasible, the student must provide notification by the end of the second working day after the absence. This notification should include an explanation of why notice could not be sent prior to the class.” If no such notice is given, the rights to a make-up are forfeited. In addition (and also in accordance with University Student Rules), a written excuse must be presented upon return to class. Specifically, in the case of illness or injury, students are required to obtain a confirmation note from a health care professional affirming date and time of a medical office visit regarding the illness or injury and confirming the need of absence before a make-up will be given.
- Students with Disabilities:** The American with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protections for persons with disabilities. Among other things, this legislation provides that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, Cain Hall, Room B118, (979) 845-1637. For additional information, visit: <http://disability.tamu.edu>
- Copyright Policy:** Printed materials disseminated in class or on the web are protected by copyright laws. One Xerox copy (or download from the web) is allowed for personal use. Multiple copies or sale of any of these materials is strictly prohibited.
- Honor Code:** Academic dishonesty is taken extremely seriously, and will be dealt with according to university policy. Always abide by the Aggie Code of Honor: “An Aggie does not lie, cheat or steal, or tolerate those who do.” For additional information, please visit: <http://www.tamu.edu/aggiehonor>

Sources of Help and Preparing for Exams:

- **Practice:** Mathematics is a skill, but you can learn it! Just as you could not improve much at basketball by just watching someone play, but never playing yourself, you cannot improve much at mathematics by just watching your instructor do mathematics, but never doing mathematics yourself. In order to succeed in this class, it is *essential* that you work the suggested homework problems (list attached), re-work the problems done in lecture, and work the week-in-review problem sets.
- **Office Hours:** I am here to help you but I can't help if I don't know there is a problem. I encourage each of you to talk to me, ask questions both in and out of class, and come to office hours. Your best bet for success is active participation!
- **Class Notes:** An outline of notes will be posted before each class day. It will be beneficial to print these out and bring them with you to class. You should review your notes after class, and make sure you get any questions you have about the material answered before the next class day.
- **Week-in-Review:** Each week, a Week-in-Review is offered that covers concepts taught during previous the week. The dates and times of these reviews will be posted on my website.
- **Help Sessions:** Help sessions are an opportunity for you to ask questions and get help with your homework. Students that have previously taken Math 151 lead the help sessions. The dates and times will be announced in class and will be linked on my webpage.
- **Streaming Videos:** <http://www.math.tamu.edu/~amy.austin/wirmath151.html>

Useful Websites: Course Website: http://www.math.tamu.edu/~alarios/courses/TAMU/2013_fall_M151/content.html
My Website: <http://www.math.tamu.edu/~alarios>
Department of Mathematics: <http://www.math.tamu.edu>
Campus emergency: <http://studentaffairs.tamu.edu/emergency>
Student Rules: <http://student-rules.tamu.edu>
Aggie Honor: <http://aggiehonor.tamu.edu/>
Disability Services: <http://disability.tamu.edu>

Additional help: Week in review: <http://www.math.tamu.edu/courses/weekinreview.html>
Amy Austin's videos: <http://www.math.tamu.edu/~austin/wirmath151.html>
Calclab information: <http://calclab.math.tamu.edu/>
Help sessions: <http://www.math.tamu.edu/courses/helpsessions.html>
Free tutoring: <http://tutor.tamu.edu/>
Old exams: <http://www.math.tamu.edu/courses/math151/common-exams/>

Disclaimer: While this syllabus was prepared carefully and according to information available at the beginning of the semester, changes may be necessary in the interest of good teaching. Changes to any of the information above will be announced in class and posted on the class web site. This includes in particular possible updates or corrections to the syllabus, and changes of exam dates.

Rough schedule: The following tentative schedule is a rough guide to the material covered in the course, but is subject to change. Last day of class is Monday. Note that the last week of class has redefined day(s). For more details, see the TAMU Academic Calendar:
<http://registrar.tamu.edu/general/calendar.aspx>

W	Dates	Sections	Material
1	8/26,8/28,8/30	1.1 and App. D	Introduction, trigonometry review, two-dimensional vectors
2	9/2,9/4,9/6	1.2, 1.3, 2.2	Dot product, parameterized curves, (qualitative) definition of limit
3	9/9,9/11,9/13	2.3, 2.5, 2.6	Calculation of limits, limits at infinity, continuity.
4	9/16,9/18,9/20	2.7, 3.1, 3.2	Velocity, differentiation
5	9/23,9/25,9/27	3.3, 3.4	Rates of Change. Derivatives of trigonometric functions. Exam I: 9/26
6	9/30,10/2,10/4	3.5, 3.6, 3.7	Chain rule, implicit differentiation, derivatives of vector-valued functions
7	10/7,10/9,10/11	3.8, 3.9, 3.10	Higher derivatives, tangents of parameterized curves. Related rates
8	10/14,10/16,10/18	3.11, 4.1, 4.2	Differentials and approximation, exponential and inverse functions.
9	10/21,10/23,10/25	4.3, 4.4	Logarithmic functions, derivatives of logarithms. Exam II: 10/24
10	10/28,10/30,11/1	4.5, 4.6, 4.8	Exponential growth and decay, inverse trig functions, L'Hospital's Rule
11	11/4,11/6,11/8	5.1, 5.2,5.3	Graphical interpretation of the derivative, first and second derivative tests
12	11/11,11/13,11/15	5.5, 5.7, 6.1	Applied max/min, anti-derivatives, Riemann sums
13	11/18,11/20,11/22	6.2, 6.3	Area and the definite integral.
14	11/25,11/27	6.4	Fundamental Theorem of Calculus. Exam III: 11/25. Thanksgiving.
15	12/2	Review	Bring questions to the review for the final exam.

Exams: There will be three midterm exams and a final exam. **You are required to bring and possibly present your Aggie Card or a government issued ID card when taking exams**, as well as standard writing materials. If you would like a left-handed desk, please request one in advance. For other accommodations, see the "Students with Disabilities" section.

Exam I: Thursday, September 26, 7:30-9:30 pm, Psychology Building 106
 Material Covered: Everything through Section 3.2.

Exam II: Thursday, October 24, 7:30-9:30 pm, Psychology Building 106
 Material Covered: 3.3-4.2.

Exam III: Monday, November 25, 7:30-9:30 pm, Richardson Petroleum Engineering Building, 114
 Material Covered: 4.3-6.2.

Final Exam: Wednesday, December 11, 10:30 am-12:30 pm, Heldenfels Hall 113
 Material Covered: All material (comprehensive).

Required at each exam unless otherwise noted:

- **You need to know your section number.**
- Your student ID.
- #2 pencils with erasers.
- No calculators or other electronic devices.
- At your desk is just you, your pencil, ID, and possibly a water bottle. No wallets, pencil bags, etc.
- Cellphones must be silenced and put away in your bags.
- Hats, sunglasses, and headphones/earphones must be removed.

Important Dates:

- Last day to drop with no penalty (Q-drop): **November 15, 5:00 pm.**
- Thanksgiving holiday, no classes: **November 28-29.**
- Last day of lecture for our class: **Monday, December 2.**

**Suggested
Homework:**

This suggested homework is not graded but it is **IMPERATIVE** you work it in order to do well on the common exams. Think of them as exercise for your math skills.

- **Appendix D:** # 1, 4, 9, 19, 23, 25, 27, 29, 33, 46, 55, 63, 67, 69, 77
- **Section 1.1:** # 3, 5, 9, 13, 17, 19, 21, 25, 27, 29
- **Section 1.2:** # 1, 5, 7, 13, 15, 17, 21, 25, 31, 35, 37, 41, 43, 51, 53, 55
- **Section 1.3:** # 1, 3, 7, 11, 15, 19, 25, 27, 29, 31, 34
- **Section 2.1:** # 1, 3, 5, 11
- **Section 2.2:** # 3, 5, 7, 13, 17, 21
- **Section 2.3:** # 3, 5, 6, 7, 13, 19, 23, 27, 39, 41, 45, 55, 67, 71
- **Section 2.5:** # 1, 3, 9, 15, 17, 23, 29, 33, 37, 39, 43, 47
- **Section 2.6:** # 3, 11, 17, 27, 29, 35, 45, 47
- **Section 2.7:** # 1, 3, 5, 9, 11, 15, 17, 21, 23
- **Section 3.1:** # 1, 5, 7, 13, 15, 23, 33, 34, 37, 39, 41, 47, 51, 53
- **Section 3.2:** # 3, 7, 9, 15, 19, 23, 29, 37, 39, 43, 50, 53, 55, 61, 70, 72
- **Section 3.3:** # 3, 7, 9, 11, 13, 17, 23
- **Section 3.4:** # 5, 7, 11, 15, 19, 21, 23, 27, 31, 33, 45
- **Section 3.5:** # 3, 7, 11, 13, 27, 33, 49, 51, 57, 59, 79, 80
- **Section 3.6:** # 1, 5, 11, 13, 21, 25, 27, 33, 35, 39, 45
- **Section 3.7:** # 3, 5, 11, 13, 17, 21
- **Section 3.8:** # 1, 2, 5, 11, 17, 31, 35, 43, 46, 49, 51
- **Section 3.9:** # 3, 5, 7, 9, 13, 17, 21
- **Section 3.10:** # 5, 7, 9, 11, 15, 17, 19, 23, 27, 31, 33
- **Section 3.11:** # 3, 9, 10, 14, 23, 27, 35, 36, 38, 39, 41, 45
- **Section 4.1:** # 3, 6, 7, 10, 17, 21, 25, 27, 29, 31, 35, 43, 47, 49, 59
- **Section 4.2:** # 3, 5, 7, 11, 13, 15, 19, 23, 25, 31, 35
- **Section 4.3:** # 3, 7, 11, 19, 21, 25, 29, 39, 43, 45, 51, 61, 70, 73, 79, 87
- **Section 4.4:** # 3, 7, 9, 13, 19, 27, 35, 39, 51, 59
- **Section 4.5:** # 3, 5a), 9, 11, 13, 15, 19, 21
- **Section 4.6:** # 3, 9, 17, 23, 27, 31, 35, 45, 51, 53, 65, 66
- **Section 4.8:** # 3, 9, 13, 17, 19, 25, 39, 41, 47, 55, 57, 61, 65
- **Section 5.1:** # 1, 3, 5, 11, 13, 17, 19, 21
- **Section 5.2:** # 3, 7, 11, 17, 19, 25, 27, 31, 37, 39, 41, 43, 45
- **Section 5.3:** # 1, 5, 7, 9, 13, 17, 19, 21, 35, 43, 45
- **Section 5.5:** # 1, 5, 7, 9, 13, 17, 19, 23, 27, 29, 31, 33, 39
- **Section 5.7:** # 3, 7, 9, 15, 17, 21, 23, 27, 31, 37, 39, 41, 43, 45, 49, 59, 61, 65, 71, 73, 79
- **Section 6.1:** # 5, 9, 19, 25, 41b), 43
- **Section 6.2:** # 1, 5, 13, 15 (at least be able to set up the the Riemann sum for 13 and 15), 23
- **Section 6.3:** # 7, 11, 17, 33, 35, 45, 47, 53, 55
- **Section 6.4:** # 1, 3, 7, 9, 11, 19, 23, 27, 31, 41, 47, 51, 57, 73, 77, 79, 83, 93, 95