

MATH 151
Engineering Math I
Fall 2011
Sections 531-536
TR 8-9:15 HELD 200

Instructor: Amy Austin

Office: 630B Blocker

E-mail Address: austin@math.tamu.edu

Web Page: <http://www.math.tamu.edu/~amy.austin/>
(check regularly for class announcements, important information, class notes and daily schedule)

Office Hours: TBA

Teaching Assistant:

- For sections 531-533: Daniel Godber (dgodber@math.tamu.edu)
- For sections 534-536: Stephen Rowe (srowe@math.tamu.edu)

Texts: All Math 151 classes use the same book: Stewart's *Calculus: Early Vectors*. You have already purchased an electronic book (eBook) through course fees. Buying a paper copy is optional. Buying the solutions manual is optional, but encouraged in order to view detailed solutions of the odd numbered suggested homework problems. The computer laboratory will use *Matlab; An Introduction with Applications*, 4th edition by Wiley.

Learning Objectives This course is to provide students with quantitative and problem-solving skills of 2-dimensional vectors and differential calculus. At the conclusion of this course, students should be able to:

- Know and use techniques of limits and differentiation.
- Apply techniques of differentiation to a variety of applications, including engineering applications.
- Understand and apply vector operations in 2-dimensions, including dot product.
- Understand the relationship between derivatives and integrals via the Fundamental Theorem of Calculus.
- Use Computer Algebra Systems such as Matlab to solve applied problems.

Common Exams: Engineering Calculus 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 and arrangements will be made for you. You and your recitation partner must purchase a packet of quizzstrips (#815 or #815E) and turn them in to me no later than the third week of class for use during the exams. Put a sticky note with your name and your partner's name/section number on the packet. Failure to do so will result in a penalty of 2 points on your common exam score. Calculators are not permitted on the common exams.

In-Class Assignments: At various times throughout the semester, you will be given in-class assignments during lecture which must be completed before leaving class. In order to complete these in-class assignments you will need to have loose-leaf notebook paper and something to write with; always come to class with these materials. Many times the in-class assignments will be due within the first 5 minutes of class, so it is imperative that you arrive to class prepared and on time each day. Other times, the in-class assignments may be given at the end of

class, so it is also imperative that you do not leave class early. None of the grades on these assignments may be dropped unless you are missing a grade due to a verified University excused absence.

Recitation: Every Wednesday, students will attend recitation. During this time, weekly activities will be assigned. Students will work in pairs during recitation, and they will complete the activity, with the supervision/help of the TA. Notes are allowed during each activity, but calculators are not permitted. At the end of the 50 minutes, students will turn this in for a weekly graded assignment.

Matlab: Every Monday, students will attend Matlab. 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 questions over homework. Visit the link below for Matlab assignments.

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

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! All information on WebAssign can be found here:

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

Academic Integrity Statement: "An Aggie does not lie, cheat, or steal or tolerate those who do". I further refer the student to the Honor Council Rules and Procedures on the web at

<http://www.tamu.edu/aggiehonor>

Students with Disabilities: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires 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, in Cain Hall, Room B118, or call 845-1637. For more information, visit <http://disability.tamu.edu>

Grades: Your grade will be determined by 3 exams, a comprehensive final, and the lab grade/online homework as follows:

Exam I: ($\frac{1}{6}$ of course grade) T, Sept 27, 7:30-9:30 pm

Exam II: ($\frac{1}{6}$ of course grade) R, Oct 27, 7:30-9:30 pm

Exam III: ($\frac{1}{6}$ of course grade) T, Nov 29, 7:30-9:30 pm

Final Exam: ($\frac{1}{4}$ of course grade) T, Dec 13, 1-3 pm

Recitation Activities: ($\frac{1}{20}$ of course grade)

In-Class Assignments: ($\frac{1}{20}$ of course grade)

Matlab: ($\frac{1}{20}$ of course grade)

Quizzes: ($\frac{1}{20}$ of course grade)

WebAssign (homework): ($\frac{1}{20}$ of course grade)

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.

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.

Sources of Help and Preparing for Exams:

1. **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!
2. **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.
3. **Week-in-Review:** Each week, I will conduct a Week-in-Review that covers concepts taught during previous the week. The dates and times will be announced in class and will be linked on my webpage.
4. **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.
5. **Streaming Videos:** <http://www.math.tamu.edu/~amy.austin/wirmath151.html>
6. **Practice:** In order to succeed in this class, it is essential that you work the suggested homework problems (attached), re-work the problems done in lecture, and work the week-in-review problem sets.

Weekly Schedule:

- **Week 1**

- Appendix D, Section 1.1 Introduction, trigonometry review, two-dimensional vectors

- **Week 2**

- Sections 1.2, 1.3, 2.2 Dot product, parameterized curves, (qualitative) definition of limit

- **Week 3**

- Sections 2.3, 2.5, 2.6 Calculation of limits, limits at infinity, continuity.

- **Week 4**

- Sections 2.7, 3.1, 3.2 Velocity, differentiation

- **Week 5**

- Sections 3.3, 3.4 Rates of Change. Derivatives of the trigonometric functions, and Exam I (Tuesday, covering thru Section 3.2)

- **Week 6**

- Sections 3.5, 3.6, 3.7 Chain rule, implicit differentiation, derivatives of vector-valued functions

- **Week 7**

- Sections 3.8, 3.9, 3.10 Higher derivatives, tangents of parameterized curves. Related rates

- **Week 8**

- Sections 3.11, 4.1, 4.2 Differentials and approximation, exponential and inverse functions.

- **Week 9**

- Sections 4.3, 4.4 Logarithmic functions, derivatives of logarithms, and Exam II (Thursday, covering Sections 3.3-4.2)

- **Week 10**

- Sections 4.5, 4.6, 4.8 Exponential growth and decay, inverse trigonometric functions, L'Hospital's Rule

- **Week 11**

- Sections 5.1, 5.2, 5.3 Graphical interpretation of the derivative, first and second derivative tests

- **Week 12**

- Sections 5.5, 5.7, 6.1 Applied max/min, antiderivatives, Riemann sums

- **Week 13**

- Sections 6.2, 6.3 Area and the definite integral. Thanksgiving falls this week.

- **Week 14**

- Section 6.4 The Fundamental Theorem of Calculus and Exam III (Tuesday, covering Sections 4.3-6.3)

- **Week 15**

- Review for FINAL. Last day of class is Tuesday. Note that the last week of class has redefined day(s). See Important Dates for details.

Suggested Homework: This is not graded but it is IMPERATIVE you work them in order to do well on the common exams

- 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