

Mathematics 2331-020 — Calculus I

Fall, 2008

Instructor: Dr. Roger Zarnowski

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Office Hours: 9:00-10:00 and 4:00-5:00 MWF,
9:30-10:30 and 3:00-4:00 TR, or by appointment.

Web Page: www.angelo.edu/faculty/rzarnows (homework assignments and other course information can be found here)

Prerequisites: Precalculus I-II or equivalent. In particular, students should be familiar with the core topics of *College Algebra* (laws of exponents, factoring, working with algebraic fractions, solving polynomial equations and inequalities, etc.), *Trigonometry* (the six trigonometric functions, special angles, identities, solving trigonometric equations, inverse trig functions), and *Analytic Geometry* (standard equations of parabolas, ellipses, and hyperbolas, graphs of these curves and of polynomial and rational functions). It is the student's responsibility to review this material as needed.

Text: *Calculus* (Early Transcendentals version), by Stewart, 6th edition.

Course Material: The central topic for this course is differential calculus. Material to be covered is listed on the attached sheet.

Grading: The course grade will be determined using a 90-80-70-60 scale (no curve) applied to the total number of points earned on homework (including some computer work), three regular exams, and the final exam. The exams will each count as 20% of the course grade, the regular homework 14% and the computer projects 6%.

Homework: Homework will be collected nearly every day. Please note the following policies regarding homework:

(a.) Work must be shown for credit. Answers alone are generally not sufficient.

(b.) Use only standard size (8.5" × 11") notebook paper with smooth edges (i.e., not ripped out of a spiral notebook, unless edges are trimmed). Write neatly, with problems in order and with pages stapled. Fold papers in half lengthwise, and write your name on the back.

(c.) Homework is due at the beginning of each class period. If you arrive late to class, you should turn in your homework immediately upon arrival. I will often work some of the homework problems at the beginning of class, but no credit will be given for these problems if your paper is turned in afterward. Also, any papers turned in after class will be considered late and will not be accepted for grading. (*See additional information on homework policies under the section on Attendance and Absences.*)

Computer Projects: There will be two or three short assignments requiring the use of *Maple* software, which is available in the student computer labs. Details will be provided in class.

Exams: Dates for the exams will be announced as the term progresses. I generally do not give makeup exams (see below), but your lowest regular exam score may be replaced by your score on the final exam. **The final exam will be cumulative, and is scheduled for Tuesday, December 9, 10:30 – 12:30.**

Attendance & Absences:

(a.) In order to comply with University regulations, I will check attendance daily. Attendance does not contribute directly toward your grade. It is, however, important for your success – you should attend class regularly, take good notes, and do all of the homework if you hope to do well in this class.

(b.) Absence from class, even for illness or family emergency, does not automatically entitle you to make up a missed exam or to turn in late homework papers. In general, no late homework papers will be accepted. No makeup exams will be administered except possibly in documented cases of extreme illness or emergency. However, I will replace your lowest exam grade (a 0 if the exam is missed) by your score on the final exam, if this is to your advantage, and I will also drop your three lowest homework scores.

(c.) If you miss class for any reason, *even for University-sponsored activities*, such as athletic events, performances, etc., it is still your responsibility to get your homework turned in (ahead of time if necessary), and to obtain the assignment for the next class period. I intend to post assignments on the web in order to make this easier for you, but this is done only as a service – each student is ultimately responsible for remaining informed about current homework assignments and exam dates. If for some reason this information doesn't appear on the course web site, you may need to call me or contact a classmate.

Classroom Expectations and Policies:

(1.) Students are expected to be present when class begins – habitual tardiness is discourteous and distracting.

(2.) Students who sleep during class may be invited to leave.

(3.) No electronic communication or entertainment devices are allowed during class – turn off and put away your cell phones, iPods and other MP3 players, PDAs, etc.

Some University Policies:

(1.) Angelo State University expects its students to maintain complete honesty and integrity in their academic pursuits. Students are responsible for understanding the Academic Honor Code, which is available on the web at <http://www.angelo.edu/forms/pdf/honorcode5.pdf>. In particular, students are expected to adhere to the rules on Academic Honesty specified in Chapter VI, Section 5.3 of the Student Handbook. Violators will be penalized in accordance with University policy.

(2.) Persons with disabilities which may warrant academic accommodations must contact the Student Life Office, Room 112 University Center, in order to request such accommodations prior to any accommodations being implemented. You are encouraged to make this request early in the semester so that appropriate arrangements can be made.

Miscellaneous Remarks:

(1.) This course covers a lot of material at a rapid pace. You should plan on allocating at least $1\frac{1}{2}$ -2 hours per day (*every* day) for study in order to do well. Some students will need to spend more time than this.

(2.) Most of the work in this class will be done without calculators, and *calculators will not be allowed on exams*.

(3.) Because I drop three homework scores and allow you to replace one regular exam score by the final exam score, I do not then again curve grades at the end of the semester. My 90-80-70-60 scale means *exactly* what it says.

(4.) Please come by during Office Hours if you need extra help with the material or if you need to discuss anything pertaining to the course. However, please note that Office Hours are not intended as personal tutoring sessions for students who intentionally miss class.

(5.) Free tutoring is available in the “Math Lab”. Tentative hours are MTWR 2:00-5:00 in MCS 215, MTWR 6:00-8:00 in MCS 211, and F 2:00-4:00 in MCS 215.

(6.) The main keys to success in this course are : attending class regularly, taking good notes, completing all assigned homework, reviewing material on a continuous basis, and asking for help when needed; do all of these, and you will probably do well in this class!

Mathematics 2331 – Calculus I

Student Learning Outcomes

- 1. The students will demonstrate factual knowledge including the mathematical notation and terminology used in this course.** Students will read, interpret, and use the vocabulary, symbolism, and basic definitions used in Calculus I as they pertain to functions, limits, and derivatives.
- 2. The students will describe the fundamental principles including the laws and theorems arising from the concepts covered in this course.** Students will identify and apply the laws and formulas that result directly from the definitions; for example, domain and range of a function, operations on functions, the limit laws, and the differentiation formulas.
- 3. The students will apply course material along with techniques and procedures covered in this course to solve problems.** Students will use the facts, formulas, and techniques learned in this course to sketch graphs of functions, to study position-velocity-acceleration problems, to solve related rate and optimization (“max-min”) problems.
- 4. The students will develop specific skills, competencies, and thought processes sufficient to support further study or work in this field or related fields.** Students will acquire a level of proficiency in the fundamental concepts and applications necessary for further study in academic areas requiring Calculus I as a prerequisite, or for work in occupational fields requiring a background in Calculus I. These fields might include computer science, engineering, the physical and natural sciences as well as mathematics.

Course Content

Textbook: *Calculus: Early Transcendentals*, Sixth Edition, by James Stewart. The following chapters are covered. (See textbook "Contents")

- 1. Functions and Models.** Brief summary of functions, operations on functions, different classes of functions and their properties.
- 2. Limits and Derivatives.** Informal definition of a limit, estimating limits, limit laws, infinite limits, continuity, the definition of the derivative, physical and geometric interpretation of the derivative, higher derivatives.
- 3. Differentiation Rules.** Derivatives of the different classes of functions, product rule, quotient rule, chain rule, implicit differentiation, related rates, differentials.
- 4. Applications of Differentiation.** Maximum and minimum values, the Mean Value Theorem, sketching graphs, L'Hospital's Rule, optimization, antiderivatives.

Maple Projects: Projects over various calculus topics that utilize the *Maple* software package.