Mathematics 2313 – Calculus I

Monday – Friday
8th Period, Room 112

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Conference: 4th Period

Course Description

MATH 2313 Calculus I (3 college credits): Exponents and radicals, logarithms, factoring, algebraic quotients, systems of equations, inequalities, absolute value, complex numbers, quadratic equations, binomial theorem, progressions, theory of equations, and determinants. Since this class functions as both a high school junior/senior mathematics class and a dual credit College Algebra class, it will not only cover the Pre-Calculus TEKS 111.42, but also the Core Curriculum Student Learning Objectives used in Texas colleges.


Prerequisite: Math 1314 and Math 1360.

Grading: Tests 50%, Quizzes 15%, Homework 10%, Final Exam 25%

Your Responsibilities: This is a college course. You will be held to the same standards as college students. In order to be successful, you must do the following:
   1. Attend class regularly.
   2. Take notes.
   3. Ask questions during class.
   4. Do your homework.
   5. Study for quizzes and tests.

Miscellaneous

1. If you will be absent on a test or quiz day, you must make arrangements to take the test or quiz prior to your absence.

2. Exams are to be finished on time – as instructed in class. No additional time will be given.

3. To receive credit for a question, you must show your work clearly, in order, and legibly.

4. If you turn in an assignment late, 10 points will be deducted per day that it is late. If you will be absent on the day an assignment is due, then the assignment may be turned in the first day you are back at school without penalty. If you miss class for any reason, even for school-sponsored activities, it is your responsibility to have your assignments submitted on time or preferably ahead of time. You are also responsible for preparing for the next class. If more than three assignments are not completed on time, then you will be removed from this course.

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5. Calculators are not generally allowed on quizzes or tests. Exact solutions are required. All work must be shown. No cell phones may be used at any time. You will not be allowed to share calculators. You will also not be allowed to use the calculators on cell phone or I-Pad.

6. Cell phone use in class is strictly prohibited.

7. If you are absent for any reason, it is your responsibility to contact a classmate or me to find out what you missed.

8. 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.

9. Persons with disabilities which may warrant academic accommodations must contact the Student Affairs Office, 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.

   Ms. Dallas A. Swafford, Director of Student Disability Services
   Houston Harte University Center, Suite 112 Phone: 325-942-2047 or by E-mail:
   dallas.swafford@angelo.edu

10. Other course rules and policies will be discussed in class.

**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: *Essential Calculus: Early Transcendentals*; 2nd edition; by James Stewart. The following chapters including the particular sections listed are covered.

3. Inverse Functions: Derivative of Logarithmic and Exponential Functions, Inverse Trigonometric Functions, Indeterminate Forms and l’Hospital’s Rule.
4. Applications of Differentiation: Maximum and Minimum Values, the Mean Value Theorem, Derivatives and Shapes of Graphs, Curve Sketching, Optimization Problems, Antiderivatives.
5. Optional Topics: Exponential Functions (3.1), Inverse Functions and Logarithms (3.2), Exponential Growth and Decay (3.4), Inverse Trigonometric Functions (3.5), Hyperbolic Functions (3.6)

Core Curriculum Student Learning Objectives

- **Core Objective (Critical Thinking):** Develop and demonstrate a logical position (i.e. perspective, thesis, hypothesis) that acknowledges ambiguities or contradictions. (CT2)
  - **Course Student Learning Objective:** Students will use mathematical theorems and formulas to differentiate functions and to identify critical points and extrema of a function.
  - **Assessment:** Assessment exam that demonstrates CT2.
- **Core Objective (Communication):** Develop, interpret, and express ideas through effective visual communication. (CS3)
  - **Course Student Learning Objective:** Students will use graphs to illustrate and identify properties of functions and relationships between the graph of a function and the graph of its derivative.
  - **Assessment:** Assessment exam that demonstrates CS3.
- **Core Objective (Empirical and Quantitative Skills):** Manipulate and analyze observable facts and arrive at an informed conclusion. (EQS2)
  - **Course Student Learning Objective:** Students will apply calculus concepts to optimization, related rates, and computation of limits.
  - **Assessment:** Assessment exam that demonstrates EQS2.

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