

MTH 132 -002
Calculus II – Fall 2009

Lectures: Monday, Wednesday, and Friday: 1:30-2:20 PM
Classroom: Harkins 303

Instructor: Eric Ruggieri

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Office Hours: Monday and Wednesday 2:30-4:00pm, Friday 11am-1pm, or by appointment

Course Description:

A continuation of the material began in Calculus I [MTH 131] including further development of integration, inverse trigonometric and logarithmic functions, techniques of integration, and applications. Other topics include infinite sequences and series, power series, and Taylor's formula. MTH 131-132 or the equivalent are recommended for all students intending to concentrate in the sciences or mathematics.

Aims:

- 1) Develop a mathematical way of thinking
- 2) To show the applicability of calculus to the world we live in
- 3) Develop a solid mathematical foundation for advanced mathematics courses

Objectives: Upon completion of the course, students should be able to:

- 1) Apply mathematical reasoning to solve new, but related problems
- 2) Demonstrate an understanding of the technique of integration
- 3) Evaluate the asymptotic properties of sequences
- 4) Begin to develop an active versus passive acquisition of knowledge
- 5) Expand their mathematical vocabulary. You cannot discuss Calculus without knowing its foundations.

Textbook: Calculus Early Transcendentals by James Stewart, 6th Edition. The book is available at the bookstore. We will cover Chapters 5, 6, 7, 8, and 11.

Grading: Your final grade will be based upon your performance on weekly homework assignments, quizzes, Mid-terms, and Final Exam.

- 1) **Homework:** Given on a weekly basis and due (at least) one week from the time it is assigned. Homework will be graded upon the effort put into it. Each week I will try to assign at least a few problems that do not appear in the book as the solutions manual for the book is on reserve at the library. It's important that you practice doing problems without the support of a solutions manual. You are encouraged to work with your classmates on the assignments, although all work turned in must be your own. Homework assignments do not constitute a specific percentage of your final grade. However, they will act as a sort of extra credit option. Those students who put sufficient effort into the assignments will have

their final grades rounded up, while those who do not will have the final grades rounded down (up to 5 points in either direction). Late assignments will not be accepted.

- 2) Weekly Quizzes (25%) will be given each Friday during the first 10 minutes of class, beginning September 18th. They will be based upon material covered on the most recent homework assignment. The average score of all quizzes will account for 25% of your final grade.
- 3) There will be two in class Mid-term Exams (25% each). I anticipate that these will fall at the middle of October [tentatively Wednesday October 14th] and at the middle of November [tentatively Monday November 16th]. Exact dates will be announced in the weeks leading up to the exams.
- 4) The Final Exam (25%) will be given at the date and time scheduled by the Registrar's Office, [Saturday December 19th 11:00 AM]. All exams are cumulative in the sense that I am free to ask a question from material covered on the previous exam. At most a small percentage of the questions will fall into this category.

The weekly quizzes and exams will have their questions drawn from the assignments as well as any examples given in class. Attendance is mandatory and no make-ups will be given without a note from health services, a coach, or the dean. If a make-up is granted, it must be completed in a timely manner so as not to fall behind the rest of the class.

Should you ever need help with this course, there are several great options available:

- 1) Ask a classmate for help
- 2) Come to see me in my office hours
- 3) Visit Academic Services in the basement of the Library. They offer one-on-one tutoring services with students who have taken this class in previous years
- 4) Mathematics Department Tutoring – Group Setting. Hours to be announced

Course Content: Numbers in parenthesis indicate section in book

- 1) Review of Calculus I – “Expanding the Mathematical Vocabulary”
 - a. Limit Laws (2.2-2.4)
 - b. Derivatives (3.1-3.6)
 - c. Mean Value Theorem (4.2)
- 2) Integration [Chapter 5 and 7] – “Understanding the Technique of Integration”
 - a. Areas and Distances (5.1, 7.7)
 - b. Definite Integral (5.2)
 - c. Indefinite Integrals and Net Change Theorem (5.4)
 - d. The Fundamental Theorem of Calculus (5.3)
 - e. Substitution Rule (5.5)
 - f. Integration By Parts (7.1)
 - g. Trigonometric Integrals (7.2)
 - h. Trigonometric Substitution (7.3)
 - i. Partial Fractions (7.4)
 - j. Integration by Tables (7.6)
 - k. Improper Integrals (7.8)

- 3) Areas and Volume [Chapter 6] – “Solving New, but Related Problems”
 - a. Areas between Curves (6.1)
 - b. Volumes (6.2)
 - c. Volume by Cylindrical Shells (6.3)
 - d. Work (6.4)
 - e. Average Value (6.5)
- 4) Applications [Chapter 8] – “Calculus in the World Around You”
 - a. Arc Length (8.1)
 - b. Area of a Surface of Revolution (8.2)
 - c. Applications to Physics, Engineering, Economics and Biology (8.3-8.4)
 - d. Probability (8.5)
- 5) Infinite Sequences and Series [Chapter 11] –
“Can You Find the Sum of an Infinite Number of Terms?”
 - a. Sequences (11.1)
 - b. Series (11.2)
 - c. Integral Test (11.3)
 - d. Comparison Test (11.4)
 - e. Alternating Series (11.5)
 - f. Absolute Convergence, Ratio, and Root tests (11.6)
 - g. Power Series (11.8-11.9)
 - h. Taylor and Maclaurin Series (11.10-11.11)