

Course and Title: Math 1910, Calculus I
Edition Date: Fall 2012 (as of 25 OCT2012)
Course Coordinator: Corlis Robe

Syllabus

Department of Mathematics and Statistics, ETSU

Course Description: Math 1910 is a course on first semester Calculus. We will cover chapters 1-5 from the textbook (functions, limits and continuity, differentiation, applications of derivatives, and integration)). This course is designed to prepare mathematics majors for higher mathematics classes and/or students in other disciplines for the requirements in their own more advanced classes.

Prerequisites: Two years of high school algebra, one year of plane geometry and trigonometry, or Math 1720 (Precalculus II).

Textbook: Thomas' Calculus, Early Transcendentals, 12th edition, by G. Thomas (revised by M. Weir, J. Hass, and F. Giordano). Addison Wesley Publishing Company, 2008

Homework: Every other odd problem from each section (i.e., 1, 5, 9, et cetera).

Graphing Calculators: TI 89 is highly recommended (TI 92 is also suitable).

Grading Procedure:

Tests (three 1:20-hour tests)	50%
Final (comprehensive)	25%
Quizzes	25%

GATEWAY EXAM: You must pass a "Gateway Exam" to pass math 1910. Pertinent information about this exam is to be found in the webpage

<http://math.etsu.edu/calculus/gate1htm.htm>

Content:

1. Review of the concept of function with particular emphasis on exponential functions and logarithms.
2. Rates of change and limits. One-sided limits and limits at infinity. Infinite limits and vertical asymptotes.
3. Continuity at a point and on an interval. Algebra of continuous functions. Intermediate Value Theorem.
4. Tangents and Derivatives.
5. The Derivative as a function. Differentiation rules for polynomials, exponentials, products, and quotients. The derivative as a rate of change.
6. Derivatives of trigonometric functions. The chain rule. Implicit differentiation.

7. Derivative of the exponential function and derivative of the natural logarithm. Derivatives of inverse functions. Derivatives of inverse trigonometric functions.
8. Related rates.
9. Linearization.
10. Absolute maximum and absolute minimum of a function. Local maximum and local minimum. Critical points. Absolute extrema of a continuous function defined on a finite closed interval.
11. The Mean Value Theorem and some of its consequences. The first derivative test.
12. Concavity. Points of inflection. Second derivative test. Curve sketching. Applied optimization problems.
13. Indeterminate forms and L'Hospital's rules.
14. Newton's method.
15. Antiderivatives. Indefinite integrals.
16. Estimating areas with finite sums. Limits of finite sums. The definite integral. Area under the graph of a nonnegative function. The average of a function.
17. The Fundamental Theorem of Calculus. The Evaluation Theorem.
18. Indefinite integrals and the substitution rule.
19. Substitution in definite integrals.
20. Area between curves.

DEPARTMENTAL ATTENDANCE REQUIREMENTS:

(approved by department vote on February 28, 1994; revised July 1999*)

The Department of Mathematics strongly advises students to attend all mathematics classes when physically able. Because there is a positive correlation between attendance and student success in mathematics, the following attendance guidelines will be used in all mathematics courses. Regardless of the reasons for the absences, should a student exceed the following limits, the instructor has the authority to assign a grade of FN or W; this policy takes precedence over the grade assignment policy for MATH 1710 and MATH 1530:

- 7 absences for classes scheduled for MWF.
- 5 absences for classes scheduled for TR or MW classes or any other 2 day/night classes.
- 3 absences for classes scheduled for one evening per week.
- 9 absences for all daytime sections of 4-hour classes.
- 5 absences for classes scheduled MTWRF (*Summer Courses).