PROPOSED SYLLABUS FOR MATH 75A
MATHEMATICAL ANALYSIS WITH REVIEW 1A

Fall 2005

Time and place:
Web page:
Units: 4

Instructor:
Office and office hours:
Phone:
Email:

Textbooks:
1. Stewart, *Calculus (Early Transcendentals)*, 5th Edition.
2. Ebersole et al., *A Companion to Calculus*.

Catalog description

Prerequisite: Elementary geometry, intermediate algebra, trigonometry, ELM requirement. Inequalities, functions, graphs, limits, continuity, derivatives, and applications, with extensive review of algebra and elementary functions. Use of computer software as an exploratory tool. G.E. Foundation B4. With Math 75B, equivalent to Math 75.

Course objectives

Upon completion of this course, students should understand:

- The benefits and limitations of mathematical models.
- The concept of a limit.
- Continuous functions.
- The definition of a derivative as a limit of difference quotients.
- How to interpret the derivative in the context of real-world examples.

Learning outcomes

Upon completion of this course, students will be able to do:

- Use functions to represent changing quantities.
- Compute limits of algebraic expressions.
- Compute the derivative of any polynomial, rational function, trigonometric function, root function, exponential function, or any combination of such functions.
- Identify the ways in which a function can fail to have a derivative.

Attendance

It is important to attend every class because every lecture is based on previous material. Attendance will be taken, and occasionally, a quiz will be given.

If you miss a class, you should contact one of your classmates or the instructor to find out what was done in class and whether important announcements were made or homework was assigned, and read the appropriate sections of the book.

Homework

There will be weekly homework. No late papers will be accepted except for in case of an illness or a serious family emergency. Working with your classmates is allowed and encouraged, but every student must write his or her own papers. If you work with someone, please indicate that on your paper.

Tests

There will be 3 hour tests and a comprehensive final exam. Make-up exams will be given only in case of an illness or a serious family emergency. No notes, books, or calculators will be allowed.

Extra help

It is important not to fall behind. If you need extra help, you are encouraged to

- ask your instructor in class
- come to the instructor's office hours or make an appointment
- work with your classmates
- go to the Mathematics tutor lab in EE 167.

Grading procedures

Your grade will be based on your performance on quizzes, tests, and homework according to the following tables.

Quizzes	30 points
Test 1	50 points
Test 2	50 points
Test 3	50 points
Homework	100 points
Final Exam	100 points
Effort, attendance, participation	20 points
Total	400 points

Points earned	Letter grade
360-400 (90%-100%)	A
320-359 (80%-89%)	B
280-319 (70%-79%)	C
240-279 (60%-69%)	D
0-239 (0%-59%)	F

Topics to be covered

1. **Function and Models.** Four ways to represent a function, Mathematical models, a catalog of essential functions, new functions from old functions.
2. **Limits and Derivatives.** The tangent and velocity problems, the limit of a function, calculating limits using the limit laws, continuity, tangents, velocities, and other rates of change.
3. **Derivatives.** The derivative as a function, differentiation formulas, rates of change in the natural and social sciences and engineering, derivatives of trigonometric functions, the chain rule, implicit differentiation.

Classroom behavior

Any disruptive behavior in class that interferes with the learning environment will not be tolerated. University policies on disruptive behavior are followed and enforced in every instance.

Academic honesty

Cheating in this class will not be tolerated. University policies on plagiarism and cheating are followed and enforced in every instance.

Students with disabilities

Anyone with a disability should inform the University and the instructor of such so that reasonable accommodations can be made for learning and evaluation. The office of Services for Students with Disabilities is located in room 1049 of the Madden Library or you may call 278-2911.

Computers

At California State University, Fresno, computers and communications links to remote resources are recognized as being integral to the education and research experience. Every student is required to have his/her own computer or have other personal access to a workstation (including a modem and a printer) with all the recommended software. The minimum and recommended standards for the workstations and software, which may vary by academic major, are updated periodically and are available from Information Technology Services or the University Bookstore. In the curriculum and class assignments, students are presumed to have 24-hour access to a computer workstation and the necessary communication links to the University's information resources.

Syllabus is subject to change

This syllabus and schedule below are subject to change in the event of extenuating circumstances. If you are absent from class, it is your responsibility to check on announcements made while you were absent.

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Tentative schedule

Note: sections 1.1, 1.2, etc, are from Stewart, *Calculus (Early Transcendentals)*
sections 2-A, 2-B, etc. are from Ebersole et al., *A Companion to Calculus.*

Week	Sections and topics
1	2-A. Function notation 2-B. Domain and range of a function 2-C. Different ways to represent a function 1.1. Four ways to represent a function 2-D. The graph of a function

Week	Sections and topics
2	2-E. Special classes of functions 1.2. Mathematical models: a catalog of essential functions 2-F. Transformations of graphs 3-A1. Algebraic combinations of functions 1.3. New functions from old functions
3	3-B. Algebraic simplification of functions 13-A. Rules of exponents 13-B. The natural exponential function 1.5. Exponential functions
4	14-A. One-to-one functions 14-B. Inverse of a function 1.6. Inverse functions and logarithms 14-C. Finding the inverse
5	15-A. Definition and properties of logarithmic functions 15-B. Graphs of logarithmic functions 2.1. Tangent and velocity problems Test 1
6	2.2. The limit of a function 5-A2. Vertical asymptotes 5-B2. Finding vertical asymptotes 2.3. Calculating limits using the limit laws
7	4-A. Polynomials 4-B. Zeros of a polynomial function 4-C. Domains of functions 2.5. Continuity
8	6-A. Rates of change: problem solving 6-B. Applications 6-C. Secant and tangent lines 5-A1. Horizontal asymptotes
9	5-B1. Finding horizontal asymptotes 2.6. Limits at infinity; horizontal asymptotes 2.7. Tangents, velocities, and other rates of change 2.8. Derivatives
10	2.9. The derivative as a function 7-A. Negative and rational exponents Test 2
11	7-B. Decomposition of functions 3.1. Derivatives of polynomials and exponential functions 3.2. The product and quotient rules 3.3. Rates of change in natural and social sciences
12	7-C. Simplifying derivatives 8-A. Angle measures 8-B. Definition and evaluation of the trigonometric functions 8-C. Properties of the trigonometric functions
13	8-D. Domain, range, and graphs of the trigonometric functions 3.4. Derivatives of trigonometric functions 8-E. Combining functions with the trigonometric functions 3-A2 Composition of functions
14	3.5. The chain rule 9-A. Implicitly defined functions 9-B. Solving equations that contain dy/dx 3.6. Implicit differentiation
15	Test 3 Review