

Math 32A: General Course Outline

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Catalog Description

32A. Calculus of Several Variables. (4) Lecture, three hours; discussion, one hour. Requisite: course 31B with a grade of C- or better. Introduction to differential calculus of several variables, vector field theory. P/NP or letter grading.

Textbook

J. Stewart, *Calculus*, 6th Ed., Thomson Learning.

Comment

The following schedule, with textbook sections and topics, is based on 26 lectures. The remaining classroom meetings are for leeway, reviews, and two midterm exams. These are scheduled by the individual instructor.

Schedule of Lectures

Lecture	Sections	Topics
1	13.1	Three Dimensional Coordinate Systems
2	13.2	Vectors
3	13.3	Dot Product
4	13.4	Cross Product
5	13.5	Equations of Lines and Planes
6	11.1	Curves defined by parametric equations
7	14.1	Vector Functions
8	14.2	Derivatives and Integrals of Vector Functions
9	14.3	Arc-length and curvature
10	14.4	Motion in space (Kepler's Laws)
11	15.1	Functions of several variables
12	13.6	Cylinders and quadric surfaces
13	15.2	Limits and Continuity
14	15.2	Limits and Continuity
15	15.3	Partial Derivatives
16	15.3	Partial Derivatives
17	15.4	Tangent Planes and Linear Approximation
18	15.4	Tangent Planes and Linear Approximation
19	15.5	Chain Rule
20	15.5	Chain Rule
21	15.6	Directional Derivatives and the Gradient Vector
22	15.6	Directional Derivatives and the Gradient Vector
23	15.7	Maximum and Minimum Values

24	15.7	Maximum and Minimum Values
25	15.8	Lagrange Multipliers
26	15.8	Lagrange Multipliers

Comments

- 1) Some problems may refer to polar coordinates. One only need inform the students that $x = r \cos \theta$ and $y = r \sin \theta$. Polar coordinates are done in detail in 32B in order to help with areas, double integrals, etc.
 - 2) The first two of Kepler's Laws should be done if at all possible.
 - 3) There are two lectures on limits and continuity, in order to introduce the concepts of open, closed sets, etc.
- Outline update: J. Ralston, 8/08

For more information, please contact Student Services, ugrad@math.ucla.edu.