# Math 3B: General Course Outline

# **Catalog Description**

**3B. Calculus for Life Sciences Students. (4)** Lecture, three hours; discussion, one hour. Requisite: course 3A with a grade of C- or better. Techniques and applications of integral calculus, introduction to differential equations and multivariable differential calculus. P/NP or letter grading.

# Textbook

C. Neuhauser, Calculus for Biology and Medicine, 3rd Ed., Prentice Hall.

### **Reviews & Exams**

The following schedule, with textbook sections and topics, is based on 25 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
1-2	6.1	The Definite Integral
3-4	6.2	The Fundamental Theorem of Calculus
5-6	6.3.1-6.3.3	Applications of Integration
7	7.1	The Substitution Rule
8	7.2	Integration by Parts and Practicing Integration
9-10	7.3	Partial Fractions
11	7.4.1-7.4.2	Improper Integrals
12-14	8.1	Differential Equations
15	8.2.1	Equilibria and Their Stability
16	9.4	Analytic Geometry
17	10.1	Functions of Several Variables
18	10.2.1 & 10.2.3	Limits and Continuity
19	10.3	Partial Derivatives
20	10.4.1	Tangent Planes and Differentiability (briefly), and Linearization
21	10.5.3	Directional Derivatives and Gradient Vectors
22	10.6.1	Maxima and Minima
23	10.6.1	Maxima and Minima
24-25	10.6.2	Extrema with Constraints - aka Lagrange Multipliers

#### Comments

For quarters with more lectures, possible topics to include are: 7.5 Numerical Integration (one lecture), 7.7 The Taylor Approximation (two lectures), 8.2.2 Single Compartment or Pool, 8.3.1 A Biological Example of Systems of Autonomous Differential Equations (one lecture).

Outline update: A. Brose, 4/04

For more information, please contact Student Services, <u>ugrad@math.ucla.edu</u>.