

UCSB Department of Mathematics
Course Outline
MATH 34A: Calculus for the Social and Life Sciences

The following is a typical outline of MATH 34A at UCSB. Instructors will generally cover the content described here, but the pacing and structure of the course may vary.

(Parentheses indicate sections from the required textbook, Calculus and Mathematical Reasoning by Daryl Cooper)

Week 1:

- Algebra, Simultaneous Equations, Perimeter/Area Problems (1.1, 1.2, 1.4, 1.5)
- Fractions, Percentages, Mixtures Problems, Car Problems (1.3)
- Inverse Functions, Temperature Conversion, Tax (1.6)

Week 2:

- Pythagoras, Area, Volume, Surface Area (1.7, 4.2)
- Circumference/Area of Circles, Unit Conversion, Growth Rate of Area vs Volume (4.1, 4.2, 4.3, 4.4)
- Midterm 1

Week 3:

- Equations of Lines, Slope, Rate of Change of Temperature (6.1)
- Proportionality, Linear Interpolation, Inverse Square Law (6.2, 6.3)
- Errors, Idea of Limits, Summation Notation (5.1, 5.2, 5.3)

Week 4:

- Powers of 10, Algebraic Manipulations of Exponents (7.1)
- Logs base 10, Algebraic Manipulations of Logarithms (7.2)
- Log Tables and Graph of 10^x (7.3, 7.4)

Week 5:

- Log (a^p), Solving Equations for Exponents, Other Bases (7.6, 7.7, 7.13)
- Compound Interest, Population Growth, Doubling Time/Half Life (7.9, 7.10, 7.11)
- Review Logs, Diverse Word Problems, Midterm Review

Week 6:

- Midterm 2
- Average Rate of Change, Oven Example, Speed (8.1, 8.2)
- Use of Units to Understand Practical Significance of Derivative (8.5)

Week 7:

- Applications of Calculus, Word Problems (Chapter 3)
- Tangent Line, Linear Approximation, Word Problems (8.6)
- Derivative of Polynomials, Interpretations, Tangent Line, Proof of Derivative of x^2 (8.7, 8.9)

Week 8:

- Review of e and Factorials, Derivative of Exponentials, Derivative of Area as Circumference (8.8)
- Second Derivative, Convex Up/Down, Acceleration (8.12)
- Midterm 3

Week 9:

- Second Derivative, Convex Up/Down, Acceleration (8.12)
- More Second Derivative, Finding Max/Min with First Derivative Test (8.13)
- Max/Min Word Problems (8.13)

Week 10:

- Max/Min Word Problems (8.13)
- Review
- Review