UCSB Department of Mathematics
Course Outline
MATH 3A: Calculus with Applications, First Course

The following is a typical outline of MATH 3A 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, <u>Calculus with Early Transcendentals, 8th Ed.</u> by Stewart)

Week 1:
• Functions and Models (Chap.1)
• Tangent Lines and Velocity (2.1)
• Limit of a Function (2.2)

Week 2:
• Limit Laws (2.3)
• Continuity (2.5)
• Limits at Infinity. Horizontal Asymptotes (2.6)

Week 3:
• Derivatives and Rates of Change (2.7)
• Derivative as a Function (2.8)
• Midterm

Week 4:
• Derivatives of Polynomials and Exponentials (3.1)
• Product/Quotient Rule (3.2)
• Trigonometric Functions (3.3)

Week 5:
• Chain Rule (3.4)
• Implicit Differentiation, Logarithms (3.5,3.6)
• Related Rates (3.9)

Week 6:
• Linear Approximations (3.10)
• Maximum/Minimum Values (4.1)
• Mean Value Theorem (4.2)

Week 7:
- How Derivatives Affect Graphs (4.3)
- L'Hospital's Rule (4.4)
- Curve Sketching (4.5, 4.6)

Week 8:
- Midterm
- Optimization (4.7)
- Newton's Method (4.8)

Week 9:
- Antiderivatives (4.9)
- Areas and Distances (5.1)
- Definite Integrals (5.2)

Week 10:
- Fundamental Theorem, Indefinite Integrals (5.3, 5.4)
- Substitution (5.5)
- Review