

Calculus for the Life Sciences

MATH – 23100

Course Syllabus

General Information

Text:	Marvin L. Bittinger, Neal Brand, John Quintanilla Calculus for the Life Sciences Addison Wesley, 2006
Calculator:	A scientific calculator. Graphing calculators are not allowed
Prerequisites:	Math 15400 or 15900

Additional information can be found on the Math Home Page

<http://www.math.iupui.edu>

Course Objective

The objective of Math 23100 is to provide a solid, practical, working knowledge of calculus and its applications to various scientific and technical fields. Particular attention is focused on applications in the Life Sciences.

Course Outline

1. Introduction to Functions and Graphs
2. The Trigonometric Functions
3. Basic Trigonometric Relations
4. Limits
5. Continuity
6. Average Rate of Change of a Function
7. The Derivative as the Slope of a Tangent Line
8. The Derivative as an Instantaneous Rate of Change
9. Growth and Decay
10. Derivatives of Polynomials, Products and Quotients of Functions
11. Derivatives of Trigonometric Functions
12. Derivative of a Power of a Function
13. The Chain Rule
14. Higher Derivatives
15. Maximum and Minimum Values

16. Using Derivatives in Curve Sketching
17. Applied Maximum and Minimum Problems, Optimization
18. Approximation of Values Using Derivatives
19. Implicit Differentiation
20. Related Rate Problems
21. Exponential Functions
22. Logarithmic Functions
23. Applications to Growth and Decay
24. Differentiation of Exponential and Logarithmic Functions
25. Antiderivatives
26. Indefinite Integrals
27. Areas and Accumulations
28. The Fundamental Theorem of Calculus
29. Definite Integrals and Their Properties
30. Basic Integration Formulas
31. Integration Methods, Substitution, Integration by Parts
32. Integration Using Tables and Computers
33. Areas and Volumes by Integration
34. Improper Integrals