DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
SYLLABUS (Tentative)
MATH 198 Calculus for Biology and Medicine

Background: The Calculus ushered in modern science and challenged the vision of poets, theologians and philosophers. It serves as the basis for much of today's science and technology.

Objectives: To better understand the mathematics; which is the foundation for modern science, with emphasis on applications, approximations, and the role of proof. To develop higher level thinking skills; in particular, to practice drawing on previous knowledge to approach new problems.

Intended Audience: Students wanting an intermediate Calculus course that prepares them for further study in biology and medicine

Prerequisite: Trigonometry and MATH 140 or equivalent.

Text: Calculus for Biology and Medicine, by Neuhauser; 3rd edition, Pearson, 2011.
ISBN 978-0321644688.

Technology: Maple or Mathematica (computer software available in campus labs).

Topics (not necessarily in this order)

	Approximate No. of Class Hours
Preparation for Calculus (Chapter 1)	4
Review of prerequisite mathematics, including algebra, functions (polynomial, rational, trigonometric, exponential, and logarithmic) , inverse functions, and graphing techniques.	
Discrete Time Models, Sequences and Difference Equations (Chapter 2)	6
Exponential Growth and Decay Models, Discrete Logistic Equation, Ricker's curve,	
Limits and Continuity (Chapter 3)	10
Tangent lines; velocity; definition of the derivative; graphical, and numerical approaches to limits; properties of limits; limits involving infinity; the Intermediate Value Theorem;	
Differentiation (Chapter 4)	16
Differentiation of algebraic and transcendental functions; the Chain rule; implicit differentiation; rates of change; higher order derivatives including acceleration; linear approximation; and finding derivatives using Maple.	
Applications of Differentiation (Chapter 5)	16
Finding and classifying extreme values; the Mean Value Theorem; the Extreme Value Theorem; slope, concavity and points of inflection; L'Hôpital's Rule; optimization; and antiderivatives.	
Testing and Review	4
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EVALUATION
Homework, Lab work, quizzes: 20-40%
In-class examinations: 40-60%
Comprehensive Final Exam: 20-40%

Free tutoring is available for this course in the Spring and Fall semesters.

NOTE: ONCE A STUDENT HAS RECEIVED CREDIT, INCLUDING TRANSFER CREDIT, FOR A COURSE, CREDIT MAY NOT BE RECEIVED FOR ANY COURSE WITH MATERIAL THAT IS EQUIVALENT TO IT OR IS A PREREQUISITE FOR IT.