SU DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
SYLLABUS (Tentative)
MATH 201 *Calculus I*

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 mathematics, science, and engineering.

Prerequisite: Trigonometry and MATH 140 or equivalent.

Text: *Calculus: Early Transcendentals*, by Stewart; 8th edition, Brooks/Cole Publishing. **Note:** Access to WebAssign is also required for the course. New versions of the text from the SU Bookstore are bundled with a license for WebAssign. An individual license for WebAssign is also available for purchase from WebAssign.net.

Technology: Mathematica (computer software available in campus labs and as a free download to current SU students) and a subscription to access WebAssign.net.

Topics (not necessarily in this order) — Approximate No. of Class Hours

Mathematica — **7**
Using the Help Menu; defining and evaluating functions; plotting functions and parametric curves; changing scales in plots; solving equations; finding limits and derivatives; using Mathematica in applications. Examples could include applications of trip, newtons methods; dynamic graphics, etc.

Limits, Continuity, and the Derivative (Chapter 2) — **12**
Tangent lines; velocity; definition of the derivative; symbolic, graphical, and numerical approaches to limits; properties of limits; one-sided limits; limits involving infinity; continuity; the Intermediate Value Theorem.

Differentiation (Chapter 3) — **14**
Differentiation of algebraic and transcendental functions; the Chain rule; implicit differentiation; rates of change; higher order derivatives including acceleration; related rates; linear approximation.

Parametric Curves (Chapter 10) — **2**
Plotting points; parametrizing circles, ellipses, function graphs and line segments; tangent lines and concavity.

Applications of Differentiation (Chapter 4) — **16**
Finding and classifying extreme values; the Mean Value Theorem; the Extreme Value Theorem; slope, concavity and points of inflection; L'Hôpital's Rule; curve sketching; optimization; Newton's Method and Antiderivatives.

Testing, Review and Optional Topics — **5**
Possible topics include: exponential growth and decay; hyperbolic functions; sequences and series.

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EVALUATION

Homework, Lab work, Quizzes:	20-40%
In-class examinations:	46-60%
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.

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