Salisbury University Department of Mathematical Sciences

MATH 201 : Calculus I
Syllabus (Tentative)

Description: Introduction to analytic geometry, limits, continuity, derivatives of elementary functions and applications of the derivative. 4 Hours Credit: Meets four hours per week. Meets General Education IVB or IVC.

Prerequisites: C or better in MATH 140 or equivalent.

Credit: Credit may only be received for one of MATH 198 and MATH 201

Intended Audience: Students wanting an introductory Calculus course that prepares them for further study in mathematics, science, and engineering.

Objective: 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.

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.

Textbooks: *Calculus: Early Transcendentals*, by Stewart; 9th 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 WebAssign accessed via the license described above.

Topic	Weeks
Mathematica	1.5
Using the Help Menu; defining and evaluating functions; plotting functions and parametric curves; changing scales in plots; solving equations; finding limits and derivatives; applications. Examples could include applications of trigonometry, newtons methods; dynamic graphics, etc.	
Limits, Continuity, and the Derivative (Chapter 2)	3
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)	3.5
Differentiation of algebraic and transcendental functions; Chain rule; implicit differentiation; rates of change; higher order derivatives including acceleration; related rates; linear approximation.	
Parametric Curves (Chapter 10)	0.5
Plotting points; parametrizing circles, ellipses, function graphs and line segments; tangent lines and concavity.	
Applications of Differentiation (Chapter 4)	4
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	1.5
Possible topics include: exponential growth and decay; hyperbolic functions; sequences and series.	
Total	**14**

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.
- Clear descriptions of thought processes, evidence of critical thinking, and effective communication must be demonstrated in written work.
- **Writing Across the Curriculum:** Students will be expected to communicate mathematics and mathematical ideas effectively in speech and writing. At the University Writing Center, trained consultants are ready to help you at any stage of the writing process. In addition to the important writing instruction that occurs in the classroom and during professors' office hours, the Center offers another site for learning about writing. **All students are encouraged to make use of these important services.**
- **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.