I. **Course Title:** Single Variable Calculus I

II. **Course Prefix/Number:** MATH 120

III. **Credit Hours:** 5.0

IV. **Prerequisite(s):** MATH 107 minimum grade: C  OR ACT Math Score of: 26

V. **Catalog Description:**
An introduction to the calculus of functions of one real variable. Topics include limits, continuity, derivatives, graphing techniques, optimization, related rates, Newton’s method, indeterminate forms and l’Hôpital’s rule, antiderivatives, the definite integral, and the Fundamental Theorem of Calculus.

VI. **Curricular Relationships:**
This course satisfies the ASC General Education Quantitative Thinking requirement. It is required of all mathematics, computer science, physics majors, and most chemistry majors. It is also taken by all pre-engineering students and by many students attempting to gain entry to medical school.

VII. **Student Learning Outcomes:**
- Students will be able to demonstrate an understanding of the fundamental concepts of analysis: limits, continuity, differentiability and integrability of real-valued functions of a single real variable;
- Students will be able to solve problems posed by the physical and natural sciences using the techniques of differential calculus;
- Students will be able to use standard methods of calculus when attacking mathematical problems;
- Students will demonstrate the ability to think logically and to present material clearly.

VIII. **Content Outline:**
- Fundamentals: The real line and the Cartesian Plane, functions and their graphs.
- Limits and continuity: limits, one-sided limits, limits at infinity, continuity and the intermediate value theorem.
- Differentiation: tangent lines and normal lines, derivatives, differentiation rules, other interpretations of the derivative, higher-order derivatives, mean value theorem.
- Applications to behavior of functions: curve sketching, maxima and minima, related rates, affine approximations.
- Introduction to integration: area, average value, Fundamental Theorem of Calculus, basic integration techniques.
IX. Course Procedures/Policies/Grading Scale:
• Homework assignments will comprise some portion of the course grade. Assignments are designed to develop a student's reading, writing, synthesis, and critical thinking skills.
• At least three examinations are given each term.
• A comprehensive final examination is given during final week.
• Computer software may be used to solve realistic problems.

X. Required/Recommended Readings:
This course will use a standard calculus for science and engineering text such as:

XI. Issues Unique to Course: None

XII. Additional Departmental Issues: None