I. Course Title: Single Variable Calculus II

II. Course Prefix/Number: MATH 121

III. Credit Hours: 5

IV. Prerequisites: MATH 120 minimum grade: C

V. Catalog Description: A continuation of the calculus of functions of one real variable. Topics include integration, applications of the definite integral, techniques of integration, improper integrals, arc length, surface area, volume, infinite series, and Taylor series.

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 employ a variety of techniques to evaluate integrals and apply them to solve problems.
- Students will test infinite series and improper integrals for convergence.
- Students will recognize indeterminate forms and use L'Hopital's rule to assess whether they converge.
- Students will construct power series representations for functions and use them to predict properties of the functions they represent.

VIII. Content Outline:

- The calculus of transcendental functions, compositions, and the chain rule.
- Integration theory, techniques of integration, approximate integration, and improper integrals. Applications of integration to area, volume, arc-length, surface area, and physics
- Indeterminate forms and L'Hopital's rule.
- Parametric curves in the plane, polar coordinates
- Infinite series, convergence tests, power series and function representations, Taylor's theorem.
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 this Course: None

XII. Additional Departmental Issues: None