PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

CALCULUS I W/PRECALCULUS: PART II
MATH 1905 (formerly MATH 1400)

Class Hours: 4.0
Credit Hours: 4.0
Laboratory Hours: 0.0
Date Revised: Fall 02

Catalog Course Description:

Single variable calculus for students majoring in science, mathematics, engineering and computer science. Limits and differentiation of polynomial, rational, trigonometric, exponential and logarithmic functions and their applications.

Entry Level Standards:

A thorough knowledge of algebraic and trigonometric functions is necessary for entrance to this course.

Prerequisite:

MATH 1735

Textbook(s) and Other Reference Materials Basic to the Course:

Required:

References:

Technology Requirements:
A graphing calculator is required. A symbolic manipulator such as the TI-89 or TI-92 is not permitted.

I. Week/Unit/Topic Basis:

Included in the topics listed below are projects. The text has a variety of laboratory, writing, and discovery projects which students may be asked to complete either individually or in groups. Some instructors may use other projects. The selection, timing, and the manner of presentation of the projects is to be determined by the instructor.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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II. Course Objectives*:

A. Become familiar with all descriptive aspects of a function. VI.1-5
B. Understand the concept of and be able to evaluate a limit of a function. VI.1-5
C. Be able to calculate derivatives of algebraic and transcendental functions. VI.1-5
D. Learn how to pose real and technical problems mathematically. VI.1-5
E. Learn how to apply limits and derivatives to solve real and technical problems. VI.1-5
F. Learn how to interpret and communicate mathematical problems and their solutions into clearly written English. VI.1-5

*Roman numerals after course objectives reference goals of the university parallel program.

III. Instructional Processes*:

Students will:

1. Use graphing calculator and/or computer software. Technological Literacy Outcome
2. Actively explore real world problems through projects such as B=ezier curves to aid in computer aided design. **Numerical Literacy Outcome, Active Learning Strategy, Transitional Strategy**

3. Translate analytical information into graphical representations. **Communication Outcome, Problem Solving and Decision Making Outcome, Technological Literacy Outcome**

4. Use multiple approaches such as physical, numerical, graphical, symbolic and verbal to solve application problems in physics, biology, engineering, and computer science. **Communication Outcome, Problem Solving and Decision Making Outcome, Numerical Literacy Outcome**

5. Learn to use the tools of calculus to study the phenomenon of change between different variables. **Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Numerical Literacy Outcome**

*Strategies and outcomes listed after instructional processes reference Pellissippi State's goals for strengthening general education knowledge and skills, connecting coursework to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

**IV. Expectations for Student Performance***:

Upon successful completion of this course, the student should be able to:

1. Determine what a function is and work comfortably with functional notation. A

2. Evaluate limits of algebraic and transcendental functions using analytic, numerical and graphing techniques. B, C

3. Evaluate derivatives of algebraic and transcendental functions using analytic, numerical and graphing techniques. B, C

4. Graph a function using the concepts of symmetry, domain, shifting and stretching, along with information gathered from limits, the function's derivative and the aid of a graphing calculator and/or computer software. A, E

5. Use derivatives to solve problems such as distance - velocity - acceleration, related rate and optimization problems. E

6. Read and interpret graphs, limits and derivatives which are used in applied settings and communicate that analysis in writing. F

7. Communicate analysis of graphs, limits and derivatives in writing. F

8. Work with technology and special projects involving real world data which enhances the conceptual understanding and usefulness of mathematics. D, F

*Letters after performance expectations reference the course objectives listed above.

**V. Evaluation**:

**A. Testing Procedures:**

Students are evaluated on the basis of tests, projects, homework, quizzes, and a comprehensive final exam. A minimum of six major tests are recommended.

**B. Laboratory Expectations:**
C. Field Work:

N/A

D. Other Evaluation Methods:

N/A

E. Grading Scale:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
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<tbody>
<tr>
<td>93 - 100</td>
<td>A</td>
</tr>
<tr>
<td>88 - 92</td>
<td>B+</td>
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<tr>
<td>83 - 87</td>
<td>B</td>
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<tr>
<td>78 - 82</td>
<td>C+</td>
</tr>
<tr>
<td>70 - 77</td>
<td>C</td>
</tr>
<tr>
<td>60 - 69</td>
<td>D</td>
</tr>
<tr>
<td>Below 60</td>
<td>F</td>
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VI. Policies:

A. Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course.

B. Academic Dishonesty:

Individual instructors must distribute their policy on academic dishonesty during the first week of class.