PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

CALCULUS II
MATH 1920

Class Hours: 4.0 Credit Hours: 4.0
Laboratory Hours: 0 Revised: Spring 07

Catalog Course Description:

Integral calculus with applications. Topics include methods of integration, sequences, series, polar coordinates, and differential equations. Applications include real world problems in physics, engineering, economics, and biology.

Entry Level Standards:

A thorough knowledge of differential calculus including trigonometric functions.

Prerequisite:

MATH 1910

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

Textbook:

References:

Technology Requirement:
Calculator: A graphing calculator is required. No symbolic manipulators.

I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Antiderivatives, areas and distances, definite integrals</td>
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<tr>
<td>2</td>
<td>The fundamental theorem of calculus, evaluating definite integrals</td>
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<tr>
<td>3</td>
<td>Substitution rule</td>
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<tr>
<td>4</td>
<td>Integration by parts, tables, and partial fractions</td>
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<tr>
<td>5</td>
<td>Approximate integration, Indeterminate forms and L'Hospital's rule</td>
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<tr>
<td>6</td>
<td>Improper integrals, more about area</td>
</tr>
<tr>
<td>7</td>
<td>Volumes, arc length</td>
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<tr>
<td>8</td>
<td>Average value of a function, physics, engineering, economics and biology applications</td>
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</tbody>
</table>
9. Modeling with differential equations, differential field
10. Euler's method, separable equations, exponential growth and decay, logistic equations
11. Sequences
12. Series, integral and comparison tests for convergence
13. Other convergence tests, power series
14. Taylor and MacLaurin series. Polar coordinates
15. Final exam

II. Course Objectives*:

A. Learn integral calculus of algebraic and transcendental functions. VI.1-6
B. Become familiar with several techniques of integration. VI.1-6
C. Evaluate integrals with indeterminate forms. VI.1-6
D. Understand the behavior of infinite series. VI.1-6
E. Solve problems using polar coordinates. VI.1-6
F. Apply calculus techniques to real world applications. VI.1-6

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

III. Instructional Processes*:

Students will:

1. Analyze real life problems such as displacement, velocity, acceleration, total area, mass, volume. Mathematics Outcome, Technological Literacy Outcome, Transitional Strategy, Active Learning Strategy
2. Advance skills in analysis, symbol manipulation, graphical conceptualization and technical writing skills using the work and/or projects assigned Mathematics Outcome, Communication Outcome, Technological Literacy Outcome, Transitional Strategy, Active Learning Strategy
3. Use graphing calculators and/or computer software to explore integrals. Mathematics Outcome, Technological Literacy Outcome

*Strategies and outcomes listed after instructional processes reference TBR’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. Integrate exponential, trigonometric, inverse trigonometric, natural and general logarithmic functions. A
2. Integrate by parts and by substitution. B
3. Integrate trigonometric integral using identities. A, B
4. Integrate rational functions by partial fraction decomposition. B
5. Use a table of integrals to evaluate an integral. B
6. Integrate indeterminate forms and improper integral. B, C
7. Test for convergence and divergence of infinite series. D
8. Give power series representation of a function. D
9. Model with differential equations. F
10. Graph parametric and polar equations. E
11. Work calculus applications in polar coordinates. E, F

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

V. Evaluation:

A. Testing Procedures:

Students are evaluated primarily on the basis of tests and quizzes. A minimum of four major tests is recommended. See individual instructor's syllabus.

B. Laboratory Expectations:

None

C. Field Work:

None

D. Other Evaluation Methods:

See individual instructor's syllabus.

E. Grading Scale:

<table>
<thead>
<tr>
<th>Score Range</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>
</tr>
<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. Individual departments/programs/disciplines, with the approval of the vice president of Academic and Student Affairs, may have requirements that are more stringent.

B. Academic Dishonesty:

Individual instructors must distribute their policies on academic dishonesty and calculator use during the first week of classes.

In addition to other possible disciplinary sanctions that may be imposed as a result of academic misconduct, the instructor has the authority to assign either (1) an F or a zero for the assignment or (2) an F for the course

C. Accommodations for Disabilities:

If you need accommodation because of a disability, if you have emergency medical information to share, or if you need special arrangements in case the building must be evacuated, please inform the instructor immediately. Please see the instructor privately after class or in his/her office. Students must present a current accommodation plan from a staff member in Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by going to Goins 127 or 131 or by phone: 694-6751 (Voice/TTY) or 539-7153.

D. Cell phones:

Cell phones are to be either turned off or put on vibration mode while in class. Instructor discretion as to penalty.

Posted: February 15, 2007