

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

CALCULUS II
MTH 1420

Class Hours: 4.0

Credit Hours: 4.0

Laboratory Hours: 0.0

**Date Revised: Spring
99**

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:

MTH 1410

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

Textbook:

Stewart, James. *Calculus Concepts and Contexts*, Brooks/Cole, 1997.

References:

Swokowski, Earl. *Calculus with Analytic Geometry*, Sixth Edition, PWS-Kent Publishing Co., 1994.

Technology Requirement:

Calculator: A graphing calculator is required. Individual instructors must distribute their policies on symbolic manipulators during the first week of classes.

Software: MathCAD, MathSoft, Inc., Cambridge, Mass.

I. Week/Unit/Topic Basis:

Week	Topic
1	Antiderivatives, areas and distances, definite integrals
2	The fundamental theorem of calculus, evaluating definite integrals
3	Substitution rule, Exam #1
4	Integration by parts, tables, and partial fractions
5	Approximate integration, Indeterminate forms and L'Hospital's rule
6	Improper integrals, more about area, Exam #2
7	Volumes, arc length

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| 8 | Average value of a function, physics, engineering, economics and biology applications |
| 9 | Exam #3, modeling with differential equations, differential fie |
| 10 | Euler's method, separable equations, exponential growth and decay, logistic equations |
| 11 | Exam #4, Sequences |
| 12 | Series, integral and comparison tests for convergence |
| 13 | Other convergence tests, power ser |
| 14 | Taylor and MacLaurin series. Exam #5 |
| 15 | Polar coordinates |
| 16 | Review and final exam |

II. Course Objectives*:

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

*Roman numerals after course objectives reference goals of the Mathematics department.

III. Instructional Processes*:

Students will:

1. Analyze real life problems such as displacement, velocity, acceleration, total area, mass, volume. *Transitional Strategy, Numerical Literacy Outcome, Active Learning Strategy, Problem Solving and Decision Making Outcome*
2. Advance skills in analysis, symbol manipulation, graphical conceptualization and technical writing skills using the work and/or projects assigned. *Problem Solving and Decision Making Outcome, Numerical Literacy Outcome, Communication Outcome*
3. Use graphing calculators and/or computer software to explore integrals. *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. 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 4 major tests is recommended. See individual instructor's syllabus.

B. Laboratory Expectations:

None

C. Field Work:

None

D. Other Evaluation Methods:

None

E. Grading Scale:

93 - 100	A
88 - 92	B+
83 - 87	B
78 - 82	C+
70 - 77	C
60 - 69	D
Below 60	F

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 policy on academic dishonesty during the first week of class.