

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

**APPLIED TECHNICAL MATHEMATICS
MTH 1021**

Class Hours: 5.0

Credit Hours: 5.0

Laboratory Hours: 0.0

Date Revised: Fall 00

Catalog Course Description:

An applications-oriented course for engineering technology majors. A practical approach to developing the necessary background in algebra and trigonometry is taken to prepare students for analytic geometry and calculus applications required in technical engineering courses. Topics include vectors, complex numbers, exponential and logarithmic functions, determinants and matrices, and variations. Geometry is recommended.

Entry Level Standards:

Students must be able to read at the college level.

Prerequisites:

Two years of high school algebra and ACT math score of at least 19; or DSM 0840 or equivalent math placement score.

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

Textbook:

Washington, Allyn J. *Basic Technical Mathematics with Calculus*. 7th ed. Addison- Wesley Pub. Co., 2000.

References:

Carman, Robert A. and Saunders, Hal M. *Modern Technical Mathematics with Calculus*. Wadsworth, Inc. 1995.

Personal Equipment:

A graphics calculator is required for this course. The TI-92 is not recommended.

I. Week/Unit/Topic Basis:

Week	Topic
1	Introduction to functions and graphing functions; 3.1 - 3.6
2	Variations, linear equations; 18.2, 5.1, 5.2
3	Solving systems of two linear equations graphically, algebraically, and with determinants; 5.3 - 5.5.
4	Solving systems of three linear equations algebraically and with determinants, solutions to quadratic equations; 5.6, 5.7, 7.1, 7.2.
5	Solutions to quadratic equations, angles (in trigonometry); 7.3, 7.4, 4.1

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| 6 | Defining trigonometric functions, right triangle applications, basic trig. function graphs; 4.2 - 4.5, 10.1. |
| 7 | More on trigonometric graphs and applications; 10.2 - 10.5. |
| 8 | Signs of trig. functions, trig. functions of any angle, radians and their applications; 8.1 - 8.4. |
| 9 | Vectors and their applications; 9.1 - 9.4. |
| 10 | Oblique triangles and the laws of sines and cosines; 9.5, 9.6. |
| 11 | Operations with exponents and radicals; 11.1 - 11.5. |
| 12 | Properties and basic operations with complex numbers; 12.1 - 12.4. |
| 13 | Properties and basic operations with exponential and logarithmic functions; 13.1 - 13.6. |
| 14 | Additional types of equations and systems of equations; 14.1 - 14.4. |
| 15 | Review for Final Exam |
| 16 | Final Exam Period |

II. Course Objectives*:

- A. Use functions and functional notation to describe and analyze technical engineering models. II, III
- B. Solve systems of equations. III, V
- C. Use the elementary trigonometric functions in solving right and oblique triangle problems. II, III
- D. Translate engineering models into vector applications. I, II, III
- E. Solve and apply exponential and logarithmic equations. II, III, IV
- F. Master complex number arithmetic. II, III

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

III. Instructional Processes*:

Students will:

1. Use graphing calculator and/or computer software to solve real world problems with applications in the technical fields. *Technological Literacy Outcome, Numerical Literacy Outcome, Transitional Strategy, Active Learning Strategy*
2. Translate analytical information into graphical representations. *Communication Outcome, Problem Solving and Decision Making Outcome, Technological Literacy Outcome*
3. Engage in collaborative activities such as group problem solving designed to reinforce thinking mathematically while solving real-world problems. *Active Learning Strategy, Problem Solving and Decision Making Outcome*

4. Communicate conclusions drawn from mathematical concepts and graphs into English. Translate real-world problems into an appropriate mathematical context in order to solve. *Numerical Literacy Outcome, Transitional Strategy, Problem Solving and Decision Making 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. Translate verbal situations into functions and algebraic linear equations and solve. A
2. Solve systems of two and three linear equations graphically, algebraically and with determinants. B
3. Translate verbal situations into quadratic equations and solve. A
4. Understand right triangle trigonometry functions and graphs. C
5. Use right triangle trigonometry functions and graphs to solve engineering applications. C
6. Use trigonometry functions and graphs to solve engineering applications involving oblique triangles. C
7. Use vectors to solve engineering applications. D
8. Understand and be able to use exponents, radicals and complex numbers in applications. E, F
9. Understand and be able to use exponential and logarithmic functions in applications. E
10. Solve radical equations. B
11. Solve higher order systems of equations. B

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

V. Evaluation:

A. Testing Procedures:

Students are evaluated primarily on the basis of tests, quizzes, and homework.

B. Laboratory Expectations:

None

C. Field Work:

None

D. Other Evaluation Methods:

As assigned by instructor

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.