



# BROWARD COMMUNITY COLLEGE COURSE OUTLINE

**LAST REVIEW:**  
2007-2008

**NEXT REVIEW:**  
2012-2013

**STATUS:**  
A

**COURSE TITLE:** Engineering Technology Math I

**COMMON COURSE NUMBER:** MTB 1325

**CREDIT HOURS:** 4

**CONTACT HOUR BREAKDOWN**  
*(per 16 week term)*

**CLOCK HOURS:**  
*(Voc. Course ONLY)*

Lecture: **64**

Lab:

Clinic:

Other:

**PREREQUISITE(S):** None

**COREQUISITE(S):** None

**PRE/COREQUISITE(S):**

**COURSE DESCRIPTION:** This is the first course in a two term sequence for electronics and computer engineering technology students. Topics include Euclidian geometry, algebra, exponents and radicals, graphing trigonometry, vectors, complex numbers, and straight line concepts. Calculators will be used to solve problems after the basic principles have been mastered.

General Education Requirements – Associate of Arts Degree (AA), meets Area(s): Area

General Education Requirements – Associate in Science Degree (AS), meets Area(s): Area

General Education Requirements – Associate in Applied Science Degree (AAS), meets Area(s): Area

## UNIT TITLES

1. Euclidian Geometry
2. Basic Arithmetic Operations With Real Numbers
3. Basic Algebraic Operations
4. Exponents and Radicals
5. Algebraic Expression
6. Equations
7. Functions, Relations and Graphs
8. Trigonometric Functions
9. Vectors and Complex Numbers
10. Straight Lines



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**EVALUATION:** Upon successful completion of this course, the students should be able to demonstrate proficiency in the algebra and geometry skills necessary for students in electronics and other technology areas. The student will be evaluated using Exams, Homework, and Quizzes.

*\*\*\* Complete the following only if course is seeking general education status \*\*\**

**GENERAL EDUCATION Competencies and Skills \*:**

Please highlight in green font all Competencies/Skills from the list below that apply to this course. In the box to the right of the Competency/Skill, enter all specific learning outcome numbers (i.e. 1.1, 2.7, 5.12) that apply.

|  |  |
|--|--|
| <b>1. Read with critical comprehension</b>   |  |
| <b>2. Speak and listen effectively</b>   |  |
| <b>3. Write clearly and coherently</b>   |  |
| <b>4. Think creatively, logically, critically, and reflectively</b><br>(analyze, synthesize, apply, and evaluate)  |  |
| <b>5. Demonstrate and apply literacy in its various forms:</b><br><i>(highlight in green ALL that apply)</i><br>( 1. technological, 2. informational, 3. mathematical,<br>4. scientific, 5. cultural, 6. historical, 7. aesthetic and/or<br>8. environmental ) |  |
| <b>6. Apply problem solving techniques to real-world experiences</b>   |  |
| <b>7. Apply methods of scientific inquiry</b>  |  |
| <b>8. Demonstrate an understanding of the physical and biological environment and how it is impacted by human beings</b>   |  |
| <b>9. Demonstrate an understanding of and appreciation for human diversities and commonalities</b>   |  |
| <b>10. Collaborate with others to achieve common goals.</b>  |  |
| <b>11. Research, synthesize and produce original work</b>  |  |
| <b>12. Practice ethical behavior</b>   |  |
| <b>13. Demonstrate self-direction and self motivation</b>  |  |
| <b>14. Assume responsibility for and understand the impact of personal behaviors on self and society</b>   |  |
| <b>15. Contribute to the welfare of the community</b>  |  |

*\* General Education Competencies and Skills endorsed by '05-'06 General Education Task Force*



# BROWARD COMMUNITY COLLEGE COURSE OUTLINE

Common Course Number: MTB1325

## UNITS

### Unit 1

#### General Outcome:

- 1.0 The students should be able to apply the principles of Euclidian Geometry.

#### Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 1.1 Define the characteristics of different triangles and their angles.
- 1.2 Use Pythagoras' theorem.
- 1.3 Determine the areas of different geometric figures.
- 1.4 Determine the volumes of different geometric figures.
- 1.5 Solve word problems.
- 1.6 Define the characteristics of circles, arcs, and angles.



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## Unit 2

### General Outcome:

- 2.0 The student shall be able to perform basic arithmetic operations and computations.

### Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 2.1 Add, subtract, multiply and divide whole numbers, fractions and decimals.
- 2.2 Express common fractions as mixed numbers and decimals and reduce fractions to lowest terms.
- 2.3 Round off decimals and identify significant figures.
- 2.4 Add and subtract fractions
- 2.5 Multiply and divide fractions.
- 2.6 Perform operations with decimals
- 2.7 Demonstrate an understanding of geometric concepts and formulas.



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## Unit 3

### General Outcome:

- 3.0 The student shall be able to discuss the system of real numbers and its properties.**

### Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 3.1 Use the number line and determine the absolute value of a number.**
- 3.2 Identify the field properties of real numbers.**
- 3.3 Add, subtract, multiply and divide signed numbers.**
- 3.4 Use the correct order of operations and remove symbols of grouping.**
- 3.5 Multiply and divide algebraic fractions.**
- 3.6 Evaluate formulas by substitution.**



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## Unit 4

### General Outcome:

- 4.0 The student shall be able to manipulate and evaluate expressions involving exponents and radicals.

### Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 4.1 Simplify expressions containing exponents
- 4.2 Simplify expressions containing zero and negative exponents
- 4.3 Write large and small numbers in scientific notations.
- 4.4 Simplify expressions containing radicals.
- 4.5 Simplify expressions containing rational exponents.



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## Unit 5

### General Outcome:

5.0 The student shall be able to perform operations with algebraic expressions

### Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

5.1 Add and subtract algebraic expressions.

5.2 Multiply algebraic expressions.

5.3 Divide algebraic expressions.

5.4 Recognize and convert SI units.



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## Unit 6

### General Outcome:

- 6.0 The student shall be able to solve linear equations and word problems leading to linear equations.

### Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 6.1 Solve linear equations which may contain parentheses, fractions or decimals.
- 6.2 Solve problems involving ratios and proportions.
- 6.3 Write algebraic representations of statements and solve word problems.
- 6.4 Solve literal equations.



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## Unit 7

### General Outcome:

- 7.0** The student shall be able to discuss and employ common graphical methods for representing data, identify characteristics of a function of the form  $F(x)$  and specify characteristics of a relation.

### Specific Measurable Learning Outcomes:

Upon successful completion of this unit, the student shall be able to:

- 7.1** Define and evaluate functions for particular values.
- 7.2** Specify the domain and range of a relation.
- 7.3** Determine if a relation is a function.
- 7.4** Plot points in a rectangular coordinate system.
- 7.5** Graph linear second and third degree functions in two variables.



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**Unit 8**

**General Outcome:**

- 8.0 The student shall be able to understand the six trigonometric functions, definitions and relationships.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

- 8.1 Understand the sexagesimal and radian systems to measure angles.**
- 8.2 Convert and use angular measurements in degrees and radians.**
- 8.3 Calculate the side and angles of a right triangle using trigonometric functions.**
- 8.4 Solve problems using trigonometric relations.**
- 8.5 Determine trigonometric functions of any angle and straight lines.**
- 8.6 Theorems of sines and cosines.**
- 8.7 Solving scalene triangles using trigonometric functions.**



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**Unit 9**

**General Outcome:**

**9.0 The student shall be able to manipulate vectors and complex numbers.**

**Specific Measurable Learning Outcomes:**

**Upon successful completion of this unit, the student shall be able to:**

**9.1 Define a complex vector.**

**9.2 Define a complex number using the j notation.**

**9.3 Convert from polar to rectangular form and vice-versa.**

**9.4 Perform operations with complex numbers.**

**9.5 Solve problems involving vectors and complex numbers.**



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## Unit 10

### General Outcome:

**10.0 The student shall be able to demonstrate proficiency in the application of straight line theory.**

### Specific Measurable Learning Outcomes:

**Upon successful completion of this unit, the student shall be able to:**

**10.1 Calculate the slope of a line.**

**10.2 Plot the equation of a line.**

**10.3 Convert between the various forms of straight line equations.**

**10.4 Recognize parallel or perpendicular lines.**