ITT Technical Institute

GE127P

College Mathematics I

Onsite and Online Course

SYLLABUS

Credit hours: 4

Contact/Instructional hours: 56 (56 Theory Hours)

Prerequisite(s) and/or Corequisite(s):

Prerequisite: GE184P Problem Solving or TB184P Problem Solving or GE150P Survey of the Sciences or equivalent; Prerequisite or Corequisite: TB133P Strategies for the Technical Professional or equivalent

Course Description:

This course will include, but is not limited to, the following concepts: quadratic, polynomial and radical equations, linear functions and their graphs, systems of linear equations, functions and their properties and triangles and trigonometric functions. Activities will include solving problems and using appropriate technological tools.

COURSE SUMMARY

COURSE DESCRIPTION

This course will include, but is not limited to, the following concepts: quadratic, polynomial and radical equations, linear functions and their graphs, systems of linear equations, functions and their properties and triangles and trigonometric functions. Activities will include solving problems and using appropriate technological tools.

MAJOR INSTRUCTIONAL AREAS

1. Mathematical Operations
2. Algebraic Concepts
3. Solving Equations
4. Quadratic Equations
5. Polynomial Equations
6. Radical Equations
7. Functions
8. Graphing
9. Linear Equations and Systems
10. Matrix Operations

COURSE LEARNING OBJECTIVES

By the end of this course, you should be able to:

1. Solve applied problems using algebraic properties, problem-solving strategies, and mathematical models.
2. Simplify algebraic expressions by performing mathematical operations.
3. Solve linear, quadratic, polynomial, and radical equations.
4. Graph linear inequalities, linear equations, and quadratic equations.
5. Solve linear systems of equations and inequalities.
6. Apply matrix methods to linear systems.
7. Perform algebraic operations on functions.
8. Identify properties and graphs of functions.

COURSE OUTLINE

MODULE 1: FUNDAMENTALS OF ALGEBRA, PART 1

COURSE LEARNING OBJECTIVES COVERED

- Solve applied problems using algebraic properties, problem-solving strategies, and mathematical models.
- Simplify algebraic expressions by performing mathematical operations.

TOPICS COVERED

- Algebraic Expressions
- Mathematical Models or Formulas
- Exponents and Rules for Evaluating and Simplifying Exponential Expressions
- Scientific Notation

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Blitzer, Chapter P, Sections P.1 and P.2.	No	3.5 hr
Lesson: Study the lesson for this module.	No	1.5 hr
Discussion: Participate in the discussion titled "Mathematical Problems and Applications."	Yes	N/A
Exercise: Submit the exercise titled "Algebraic Expressions and Real Numbers."	Yes	2 hr

Total Out-Of-Class Activities: 7 Hours

MODULE 2: FUNDAMENTALS OF ALGEBRA, PART 2

COURSE LEARNING OBJECTIVES COVERED

- Solve applied problems using algebraic properties, problem-solving strategies, and mathematical models.
- Simplify algebraic expressions by performing mathematical operations.

TOPICS COVERED

- Real Numbers
- Radicals and Rational Exponents
- Polynomials and Factoring Polynomials
- Rational Expressions

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Blitzer, Chapter P, Sections P.3-P.6.	No	4.5 hr
Lesson: Study the lesson for this module.	No	2 hr
Discussion: Participate in the discussion titled "Exponents and Expressions."	Yes	N/A
Practice Quiz: Take Practice Quiz 1.	No	1 hr
Quiz: Prepare for Quiz 1.	No	1 hr
Exercise: Submit the exercise titled "Exponents and Polynomials."	Yes	1.5 hr
Lab: Complete the lab titled "Polynomials and Rational Expressions."	Yes	1.5 hr
Quiz: Take Quiz 1.	Yes	N/A

Total Out-Of-Class Activities: 11.5 Hours

MODULE 3: EQUATIONS, INEQUALITIES, AND MATRICES

COURSE LEARNING OBJECTIVES COVERED

- Solve applied problems using algebraic properties, problem-solving strategies, and mathematical models.
- Solve linear, quadratic, polynomial, and radical equations.
- Graph linear inequalities, linear equations, and quadratic equations.
- Solve linear systems of equations and inequalities.
- Apply matrix methods to linear systems.

TOPICS COVERED

- Linear Equations
- Polynomial, Radical, and Quadratic Equations
- Equations with Rational Exponents
- Equations Involving Absolute Value
- Linear and Absolute Value Inequalities
- Systems of Linear Equations in Two Variables
- Matrix and Matrix Row Operations

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Blitzer, Chapter 1, Sections 1.1–1.3 and Sections 1.5–1.7; Chapter 8, Section 8.1; and Chapter 9, Section 9.1.	No	11.5 hr
Lesson: Study the lesson for this module.	No	2 hr
Discussion: Participate in the discussion titled "Equations and Matrix Row Operations."	Yes	N/A
Exercise: Submit the exercise titled "Equations and Their Graphs."	Yes	1.5 hr
Lab: Complete the lab titled "Linear Equations and Matrices."	Yes	1.5 hr

Total Out-Of-Class Activities: 16.5 Hours

MODULE 4: FUNCTIONS AND THEIR GRAPHS

COURSE LEARNING OBJECTIVES COVERED

- Solve applied problems using algebraic properties, problem-solving strategies, and mathematical models.
- Perform algebraic operations on functions.
- Identify properties and graphs of functions.

TOPICS COVERED

- Functions and Their Graphs
- Linear Functions and Slope
- Transformations of Functions
- Composite Functions
- Inverse Functions

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Blitzer, Chapter 2, Sections 2.1-2.7.	No	9.5 hr
Lesson: Study the lesson for this module.	No	2 hr
Discussion: Participate in the discussion titled "Functions, Slopes, and Graphs."	Yes	N/A
Practice Quiz: Take Practice Quiz 2.	No	1 hr
Quiz: Prepare for Quiz 2.	No	1 hr
Exercise: Submit the exercise titled "Functions—Their Slopes and Graphs."	Yes	1.5 hr
Lab: Complete the lab titled "Transformation, Composite, and Inverse Functions."	Yes	1.5 hr
Quiz: Take Quiz 2.	Yes	N/A

Total Out-Of-Class Activities: 16.5 Hours

MODULE 5: POLYNOMIAL AND RATIONAL FUNCTIONS

COURSE LEARNING OBJECTIVES COVERED

- Solve applied problems using algebraic properties, problem-solving strategies, and mathematical models.
- Graph linear inequalities, linear equations, and quadratic equations.
- Perform algebraic operations on functions.
- Identify properties and graphs of functions.

TOPICS COVERED

- Quadratic Functions
- Polynomial Functions and Their Graphs
- Rational Functions and Their Graphs
- Polynomial and Rational Inequalities
- Modeling Using Variation

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Blitzer, Chapter 3, Sections 3.1–3.7.	No	8.5 hr
Lesson: Study the lesson for this module.	No	2 hr
Discussion: Participate in the discussion titled "Functions and Inequalities."	Yes	N/A
Exercise: Submit the exercise titled "Quadratic and Polynomial Functions."	Yes	1.5 hr
Lab: Complete the lab titled "Rational Functions and Inequalities."	Yes	1.5 hr
Practice Exam: Prepare for the practice exam.	No	5 hr

Total Out-Of-Class Activities: 18.5 Hours

MODULE 6: EXPONENTIAL AND LOGARITHMIC FUNCTIONS

COURSE LEARNING OBJECTIVES COVERED

- Solve applied problems using algebraic properties, problem-solving strategies, and mathematical models.
- Simplify algebraic expressions by performing mathematical operations.
- Solve linear, quadratic, polynomial, and radical equations.
- Graph linear inequalities, linear equations, and quadratic equations.
- Solve linear systems of equations and inequalities.
- Apply matrix methods to linear systems.
- Perform algebraic operations on functions.
- Identify properties and graphs of functions.

TOPICS COVERED

- Exponential Functions
- Logarithmic Functions
- Exponential and Logarithmic Equations

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Blitzer, Chapter 4, Sections 4.1-4.4.	No	4.5 hr
Lesson: Study the lesson for this module.	No	1.5 hr
Lab: Complete the lab titled "Exponential and Logarithmic Functions."	Yes	1.5 hr
Practice Exam: Take the practice exam.	No	N/A
Final Exam: Prepare for the final exam.	No	5 hr
Final Exam: Take the final exam.	Yes	N/A

Total Out-Of-Class Activities: 12.5 Hours

EVALUATION AND GRADING

EVALUATION CRITERIA

The graded assignments will be evaluated using the following weighted categories:

CATEGORY	WEIGHT
Discussion	15%
Exercise	25%
Lab	35%
Quiz	10%
Final Exam	15%
TOTAL	100%

GRADE CONVERSION

The final grades will be calculated from the percentages earned in the course, as follows:

GRADE		PERCENTAGE
A	(4.0)	90–100%
B+	(3.5)	85–89%
B	(3.0)	80–84%
C+	(2.5)	75–79%
C	(2.0)	70–74%
D+	(1.5)	65–69%
D	(1.0)	60–64%
F	(0.0)	<60%

LEARNING MATERIALS AND REFERENCES

REQUIRED RESOURCES

COMPLETE TEXTBOOK PACKAGE

- Blitzer, R. (2010). *Algebra & trigonometry (Custom 4th ed.). Upper Saddle River, NJ:* Prentice Hall Publishing.
- Blitzer, R. (2010). *Student solution manual (Custom 4th ed.). Upper Saddle River, NJ:* Prentice Hall Publishing.

OTHER ITEMS

- Blitzer, R. (2010). *Algebra & trigonometry chapter test prep video CD (Custom 4th ed.).* Upper Saddle River, NJ: Prentice Hall Publishing.
  Use the following link to access the chapter's test prep videos:
  http://media.pearsoncmg.com/pcp/itt_media/1256386677/index.html
- Recommended Equipment:
  - Scientific calculator (Texas TI30)

RECOMMENDED RESOURCES

- Professional Associations
  - American Mathematical Society: www.ams.org
  - Association for Women in Mathematics: www.awm-math.org
  - Mathematical Association of America: www.maa.org
- ITT Tech Virtual Library (accessed via Student Portal | https://studentportal.itt-tech.edu)
  - Basic Search>
    - Immergut, B., & Burr-Smith, J. (2005). *Arithmetic and algebra–again leave math anxiety behind forever [electronic resource] (2nd ed.). New York, NY: McGraw-Hill, Inc.*

- School of Study> General Education Information>
  - Recommended Links
    - MathGV
    - Paul's Online Math Notes
    - Practical Algebra Lessons from Purplemath
    - The Math Page
  - Research Guides
    - Tips for Math Success
  - Tutorial Links
    - MathTV.com

- Other References
  - Graph 4.3

    http://www.padowan.dk/graph/

    This Web page contains an open-source graphing tool. You can copy graphs and put them into Microsoft Word documents.
  - InterAct Math

    http://interactmath.com/

    A Web site that contains exercises that accompany the end-of-section exercise in your textbook

INSTRUCTIONAL METHODS AND TEACHING STRATEGIES

The curriculum employs a variety of instructional methods that support the course objectives while fostering higher cognitive skills. These methods are designed to encourage and engage you in the learning process in order to maximize learning opportunities. The instructional methods include but are not limited to lectures, collaborative learning options, use of technology, and hands-on activities.

To implement the above-mentioned instructional methods, this course uses several teaching strategies, such as practice quizzes in each module that you can use to prepare for the graded quizzes. Your progress will be regularly assessed through a variety of assessment tools including discussions, labs, exercises, quizzes, and a final exam.

OUT-OF-CLASS WORK

For purposes of defining an academic credit hour for Title IV funding purposes, ITT Technical Institute considers a quarter credit hour to be the equivalent of: (a) at least 10 clock hours of classroom activities and at least 20 clock hours of outside preparation; (b) at least 20 clock hours of laboratory activities; or (c) at least 30 clock hours of externship, practicum or clinical activities. ITT Technical Institute utilizes a “time-based option” for establishing out-of-class activities which would equate to two hours of out-of-class activities for every one hour of classroom time. The procedure for determining credit hours for Title IV funding purposes is to divide the total number of classroom, laboratory, externship, practicum and clinical hours by the conversion ratios specified above. A clock hour is 50 minutes.

A credit hour is an artificial measurement of the amount of learning that can occur in a program course based on a specified amount of time spent on class activities and student preparation during the program course. In conformity with commonly accepted practice in higher education, ITT Technical Institute has institutionally established and determined that credit hours awarded for coursework in this program course (including out-of-class assignments and learning activities described in the “Course Outline” section of this syllabus) are in accordance with the time-based option for awarding academic credit described in the immediately preceding paragraph.

ACADEMIC INTEGRITY

All students must comply with the policies that regulate all forms of academic dishonesty or academic misconduct. For more information on the academic honesty policies, refer to the Student Handbook and the School Catalog.

INSTRUCTOR DETAILS

Instructor Name	
Office Hours	
Contact Details	

(End of Syllabus)