



ILLINOIS VALLEY COMMUNITY COLLEGE

COURSE OUTLINE

DIVISION: Natural Sciences and Business

COURSE: MTH 1206 Technical Mathematics I

Date: Spring 2022

Credit Hours: 3

Complete all that apply or mark "None" where appropriate:

Prerequisite(s): MTH 0910 with a C or better

Enrollment by assessment or other measure? Yes No

If yes, please describe: By appropriate assessment.

Corequisite(s): None

Pre- or Corequisite(s): None

Consent of Instructor: Yes No

Delivery Method:

<input checked="" type="checkbox"/> Lecture	3 Contact Hours (1 contact = 1 credit hour)
<input type="checkbox"/> Seminar	0 Contact Hours (1 contact = 1 credit hour)
<input type="checkbox"/> Lab	0 Contact Hours (2-3 contact = 1 credit hour)
<input type="checkbox"/> Clinical	0 Contact Hours (3 contact = 1 credit hour)
<input checked="" type="checkbox"/> Online	
<input checked="" type="checkbox"/> Blended	
<input checked="" type="checkbox"/> Virtual Class Meeting (VCM)	

Offered: **Fall** **Spring** **Summer**

CATALOG DESCRIPTION and IAI NUMBER (if applicable):

This course in Technical Mathematics includes topics in arithmetic, the metric system, selected topics in basic algebra, practical geometry, and right triangle trigonometry. Emphasis is on the use of mathematics to solve typical job problems. This course is not intended for transfer.

ACCREDITATION STATEMENTS AND COURSE NOTES:

None

COURSE TOPICS AND CONTENT REQUIREMENTS:

- I. Basic concepts
 - a. Addition, subtraction, multiplication, and division of whole numbers
 - b. Addition, subtraction, multiplication, and division of fractions
 - c. Addition, subtraction, multiplication, and division of decimals
 - d. Addition, subtraction, multiplication, and division of signed numbers
 - e. Order of operations
 - f. Formulas
 - g. Prime factorization
 - h. Scientific notation
 - i. Percents
- II. Metric and English systems
 - a. Basic units
 - b. Conversion factors within systems
 - c. Precision and accuracy
- III. Basic algebra
 - a. Operations with polynomials
 - b. Simplifying algebraic expressions
 - c. Solving equations in one variable
 - d. Formulas
- IV. Ratios and proportion
 - a. Definition
 - b. Applications using ratios
 - c. Applications using proportions
 - d. Percents
 - e. Direct variation with application
 - f. Inverse variation with application
- V. Geometry
 - a. Angles and polygons
 - b. Quadrilaterals
 - c. Triangles
 - d. Similar polygons
 - e. Circles
 - f. Radian measure
 - g. Prisms
 - h. Cylinders
 - i. Pyramids and cones
 - j. Spheres
 - k. Applications
- VI. Trigonometry
 - a. Ratios
 - b. Finding angles with ratios
 - c. Finding sides with ratios

- d. Solving right triangles
- e. Applications

INSTRUCTIONAL METHODS:

- Lectures
- Small group/one-on-one discussion
- Discussion boards
- Class participation and activities
- Computer assignments (homework, section videos, examples, etc.)
- Quizzes
- Unit Tests

EVALUATION OF STUDENT ACHIEVEMENT:

Unit tests
Comprehensive final exam
MyMathLab assignments
Quizzes

INSTRUCTIONAL MATERIALS:

Textbooks (Etext)

College Mathematics For Trade and Technologies, Cleaves & Hobbs, 10th edition,
Pearson
Student Access Kit for MyMathLab

Resources

None

LEARNING OUTCOMES AND GOALS:

Institutional Learning Outcomes

- 1) Communication – to communicate effectively;
- 2) Inquiry – to apply critical, logical, creative, aesthetic, or quantitative analytical reasoning to formulate a judgement or conclusion;
- 3) Social Consciousness – to understand what it means to be a socially conscious person, locally and globally;
- 4) Responsibility – to recognize how personal choices affect self and society.

Course Outcomes and Competencies

Upon completion of the course, the student will be able to:

1. Demonstrate a working knowledge of arithmetic.
 - 1.1. Perform the operations of adding, subtracting, multiplying, and dividing on whole numbers, fractions, decimals, and signed numbers.
 - 1.2. Perform operations in the correct order on problems that contain different operations, parenthesis, and exponents.
 - 1.3. Substitute given values into formula and calculate the unknown.
 - 1.4. Apply the operations of arithmetic to determine solutions to applied problems.
 - 1.5. Solve percentage problems.
 - 1.6. Write numbers in scientific notation.

2. Demonstrate a working knowledge of the English and Metric Systems of measurement.
 - 2.1. Know the relationship between various measurements in the English system and be able to connect one to the other.
 - 2.2. Learn the basic units and common prefixes of the SI metric system relating to length, mass, weight, volume, area, time, and temperature.
 - 2.3. Convert within the metric system.
 - 2.4. Apply the rules for precision and accuracy to solutions of problems.
3. Demonstrate the ability to manipulate polynomials.
 - 3.1. Simplify algebraic expressions.
 - 3.2. Add and subtract monomials and polynomials.
4. Demonstrate the ability to solve equations and formulas.
 - 4.1. Determine if a given value is a solution of a given equation.
 - 4.2. Solve linear equations in one variable.
 - 4.3. Solve formulas for one variable in terms of other variables.
5. Demonstrate a working knowledge of ratio and proportion.
 - 5.1. Use ratios to compare quantities.
 - 5.2. Solve a proportion when one element is unknown.
 - 5.3. Use direct and inverse variation to solve problems.
6. Demonstrate a working knowledge of geometry.
 - 6.1. Recognize and define angle, vertex, acute, right, obtuse, intersection lines, parallel, lines, perpendicular lines, complementary angles, supplementary angles, vertical angles, and polygons.
 - 6.2. Use a protractor to measure angles.
 - 6.3. Use the properties of parallel lines to determine angle measure.
 - 6.4. Recognize the following figures and know the formulas for finding area and perimeter: rectangle, square, parallelogram, rhombus, trapezoid, and triangle.
 - 6.5. Use a calculator and Pythagorean Theorem to calculate one side of a right triangle when the two other sides are given.
 - 6.6. Use the properties of similarity to find the missing information in various similar figures.
 - 6.7. Find area and circumference of circles.
 - 6.8. Define central angle, inscribed angle, arc, chord, tangent, and secant.
 - 6.9. Convert between degree measure and radians.
 - 6.10. Find the area of a sector of a circle.
 - 6.11. Find surface area and volume of prisms, cylinders, pyramids, cones, and spheres.
7. Demonstrate a working knowledge of right triangle trigonometry.
 - 7.1. Calculate sine, cosine, and tangent ratios given the sides of a triangle.
 - 7.2. Use a calculator to find sine, cosine, and tangent of angles.
 - 7.3. Find the degree measure of an angle given its sine, cosine, or tangent.
 - 7.4. Solve right triangles.
 - 7.5. Apply trigonometric ratios to applied problems.