

Applied Math I Course Competencies

1. Add, subtract, multiply and divide fractions.
2. Add, subtract, multiply and divide decimals.
3. Apply percentages to real life situations.
4. Determine gross income using a variety of payment methods.
 - a. Hourly Pay – including possible overtime
 - b. Piecework
 - c. Salary
 - d. Commission – both straight and graduated.
5. Determine net income.
6. Write checks and balance a checking account based on the check register and bank statement.
7. Calculate interest on a savings account using both simple and compound interest.
8. Calculate total cost of a cash purchase including sales tax, markdowns, and coupons/rebates.
9. Determine the unit price of an item and select the best buy based on price.
10. Analyze a charge account statement including determining the finance charge on the account.
11. Identify the types of loans available to consumers.
12. Compute the amount financed, the final payment, the APR, and the total paid on an installment loan.
13. Determine the costs of owning/leasing/renting and operating an automobile.
14. Determine the costs of owning/renting, upkeep, and utilities for housing.
15. Determine the costs of health and life insurance.
16. Compare and Contrast types of life insurance.
17. Apply mathematics and technology to a variety of vocational fields of study.
 - a. Natural Resource Management
 - i. Observe effects over time of natural and human effects on the environment
 - ii. Explain how human activities affect natural resources and the landscape.
 - iii. Describe how human policies, throughout their impact on the natural environment, can also have significant consequences for human beings.
 - iv. Understand and explain latitude and longitude.
 - v. Measure quantities.
 - vi. Mix simple solutions.
 - vii. Measure pH to determine acidity or alkalinity of different substances.
 - viii. Calibrate and use an electronic conductivity meter to measure dissolved solids in solution.
 - ix. Use an electronic dissolved oxygen meter to quantify the oxygen in a solution.
 - x. Calculate solution percentages in terms of weight and volume.

- xii. Understand the concepts of image interpretation for different types of sensors.
 - xiii. Explain how satellites can measure and/or image phenomena on Earth.
 - xiv. Understand and explain the concept of a computer model, especially a Geographic Information System (GIS) and its various components.
 - xv. Determine the use of a GIS.
 - xvi. Explain and in some cases demonstrate and/or measure concepts and phenomena of chemistry such as acids, bases, pH, dissolved oxygen, solutions, photochemistry, and dissolved acids.
- b. Residential Wiring
- i. Identify and describe the basic tools used in residential wiring.
 - ii. Identify and name a variety of electrical components.
 - iii. Understand wire sizes and uses.
 - iv. Demonstrate the proper wiring of low voltage electrical components.
 - v. Compare and contrast 120V and 220V.
- c. Residential Plumbing
- i. Identify and describe the basic tools used in residential plumbing.
 - ii. Discuss the different types of residential plumbing components.
 - iii. Understand the use and sizes of residential plumbing components.
 - iv. Discuss and demonstrate the proper mounting of residential plumbing components.
 - v. Distinguish between hot and cold water lines.
- d. Pneumatics
- i. Identify and name pneumatic components.
 - ii. Identify and name major air contaminants.
 - iii. Prevent problems associated with contaminants in a pneumatic system.
 - iv. Utilize many different tools to control air flow in a pneumatic system.
 - v. Identify and use several different components in a pneumatic system that yield different effects such as motion, rate, flow, and force.
 - vi. Identify real world applications of pneumatics to run operations more efficiently.
- e. Electronics
- i. Name and explain the basic function of electrical and electronic components.
 - ii. Read a simple schematic diagram and recognize schematic symbols of electronics.
 - iii. Recognize a series and a parallel circuit and be able to compute resistance totals in each.

- iv. Build electronic circuits.
- v. Recognize four parts that can control an electric current.
- vi. Recognize and connect a transistor into a circuit.
- vii. Describe what an SCR transistor or thruster does and recognize its symbol.
- viii. Use a multi-meter to measure current, voltage, and resistance.
- ix. Predict what will happen to the current flow in a circuit when a resistor is added.
- f. Multi-Media
 - i. Demonstrate an understanding of computer interaction and functions.
 - ii. Demonstrate an understanding of basic animation techniques.
 - iii. Edit computer animations.
 - iv. Combine animation with sound.
 - v. Plan and create animations.
 - vi. Apply math to animation procedures.
- g. Flight Simulator
 - i. Plan a flight.
 - ii. Interpret a sectional map
 - iii. Perform coordinated maneuvers.
 - iv. Calculate distance, time, and fuel.
 - v. Use maps and radio beacons for navigation.
 - vi. Read and interpret basic aircraft instruments.
 - vii. Execute successful simulated takeoffs and landings.
 - viii. Achieve and maintain designated headings and altitudes.
- h. Embroidery
 - i. Identify components of an embroidery system.
 - ii. Calculate cost of embroidering a design.
 - iii. Set up and operate an embroidery machine.
 - iv. Use a computer to control an embroidery machine.
 - v. Use a computer to create and modify text for embroidery.
- i. Three-Dimensional Drawing
 - i. Demonstrate an understanding of what three-dimensional modeling is, and how it is used.
 - ii. Open and edit graphic files.
 - iii. Describe objects in three-dimensional space.
 - iv. Combine three-dimensional images into a complex model.
 - v. Create an animated 3D sequence.
 - vi. Recognize the use of 3D imaging as special effects in television and media.
 - vii. Apply the coordinate system in a three dimensional drawing system.
- j. Laser Communications
 - i. Describe the use of lasers to transmit and receive information.
 - ii. Distinguish between analog and digital information.
 - iii. Design a simple communication system using a laser.

- iv. Demonstrate an understanding of the causes of signal loss in laser transmissions.
- v. Describe the use of an attenuator to control laser beam strength.
- vi. Describe the correlation between signal strength and voltage at the receiver.
- vii. Describe some of the problems in using lasers to communicate over long distances.
- viii. Use a laser to switch devices on and off.
- ix. Determine the pollution levels in water, based on the strength of a laser beam.
- x. Calculate signal loss over distance.
- xi. Demonstrate an understanding of the importance of splicing fiber optic cables.
- xii. Design a laser activated security system.

18. Identify careers using mathematics and technology in a variety of vocational fields.

- a. Natural Resource Management
- b. Residential Wiring
- c. Residential Plumbing
- d. Pneumatics
- e. Electronics
- f. Multi-Media
- g. Flight Simulator
- h. Embroidery
- i. Three-Dimensional Drawing
- j. Laser Communications

19. Operate software packages in the fields of electronics, embroidery, multi-media, three dimensional drawing, flight simulation, and natural resource management.

20. Simulate a variety of vocational jobs in a lab setting.

- a. Natural Resource Management
- b. Residential Wiring
- c. Residential Plumbing
- d. Pneumatics
- e. Electronics
- f. Multi-Media
- g. Flight Simulator
- h. Embroidery
- i. Three-Dimensional Drawing
- j. Laser Communications

21. Identify safety needs in a variety of vocational areas.

- a. Natural Resource Management
- b. Residential Wiring
- c. Residential Plumbing
- d. Pneumatics

- e. Electronics
- f. Multi-Media
- g. Flight Simulator
- h. Embroidery
- i. Three-Dimensional Drawing
- j. Laser Communications