

# Des Moines Area Community College

## Course Information – EFFECTIVE Aug. 2006

Acronym/Number MAT 772

Historical Ref. MATH 410

Title Applied Math

Credit breakout 3      3      0      0      0  
(credit      lecture      lab      practicum      work experience)

### PREREQUISITE(S):

### COURSE DESCRIPTION:

A course in elementary mathematical skills for technicians. Topics covered include fundamental operations with whole numbers, fractions, decimals, and signed numbers; percents; geometric figures and basic constructions; area and volume formulas; English/Metric systems; measurements; and the interpretation of graphs and charts.

### COURSE COMPETENCIES:

*During this course, the student will be expected to:*

1. Use numbers in a variety of equivalent forms.
  - 1.1 Read whole numbers, fractions, and decimals.
  - 1.2 List equivalent fractions.
  - 1.3 Convert fractions to mixed numbers (and vice versa).
  - 1.4 Convert fractions to decimals (and vice versa).
  - 1.5 Find common denominators.
  - 1.6 Define percents.
  - 1.7 Convert fractions and decimals to percents (and vice versa).
  - 1.8 Read signed numbers.
  - 1.9 Describe the real number line.
  - 1.10 Define absolute value.
  - 1.11 Define exponential notation.
  - 1.12 Define scientific notation.
  
2. Compute with whole numbers, fractions, decimals, and integers in real world and mathematical solving.
  - 2.1 Apply the four arithmetic operations (add, subtract, multiply, and divide) to whole numbers.
  - 2.2 Apply the four arithmetic operations to fractions.
  - 2.3 Apply the four arithmetic operations to decimals.
  - 2.4 Apply the four arithmetic operations to integers.
  - 2.5 Apply the four arithmetic operations to complex fractions.
  - 2.6 Demonstrate the use of exponential notation in computation.
  - 2.7 Demonstrate the use of scientific notation in computation.

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3. Use computational techniques appropriate to specific problems.
  - 3.1 Model real-world problems.
  - 3.2 Calculate a solution to the problem.
  - 3.3 Round the answer when necessary.
  - 3.4 Calculate using a calculator.
  
4. Recognize whether or not an answer is reasonable.
  - 4.1 Estimate an answer.
  - 4.2 Determine the reasonableness of the answer.
  
5. Identify basic geometric figures.
  - 5.1 Identify two dimensional figures and parts.
  - 5.2 Identify three dimensional figures and parts.
  
6. Demonstrate basic geometric constructions.
  - 6.1 Construct:
    - a. an angle bisector
    - b. congruent angles
    - c. line segment bisectors
    - d. perpendicular bisector of a line
    - e. parallel lines
    - f. perpendicular to a line from a point on the line
    - g. perpendicular to a line from a point off the line
    - h. inscribed regular triangle
    - i. inscribed regular square
    - j. inscribed regular hexagon
    - k. inscribed regular pentagon
    - l. congruent triangles
    - m. a triangle given three sides
    - n. altitude of a triangle
    - o. center of balance of a triangle
    - p. inscribed circle in a triangle
    - q. a circumscribed circle about a triangle
  
7. Apply geometric properties and relationships in real-world and mathematical problem solving.
  - 7.1 Demonstrate the properties of:
    - a. parallel lines and a transversal line
    - b. vertical angles
    - c. adjacent angles
    - d. perpendicular lines
    - e. complementary angles
    - f. supplementary angles
    - g. corresponding angles
    - h. alternate exterior
    - i. interior angles
  - 7.2 Use the Pythagorean theorem.

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- 7.3 Use similarity in solving applied problems
  - 7.4 Demonstrate the relationships between central angle, arcs, and inscribed angles.
  - 7.5 Explain the intersection of lines and circles.
  - 7.6 Calculate the angles formed by circles and lines.
  - 7.7 Use a protractor to measure angles.
8. Use geometric formulas to solve problems.
- 8.1 Calculate the measure of an angle in both degrees and radians.
  - 8.2 Calculate the area and volume of plane figures.
  - 8.3 Calculate lateral surface area, total surface area and volume of geometric solids (prisms, cylinders, pyramids, cones, and spheres).
9. Convert measurements within the metric and English systems and between systems.
- 9.1 Identify the units in the English and Metric systems.
  - 9.2 Convert within the English System.
  - 9.3 Convert within the Metric System.
  - 9.4 Convert between Metric and English Systems.
  - 9.5 Model dimensional figures.
  - 9.6 Calculate answers to dimensional figures.
10. Use appropriate units and tools to measure to the degree of accuracy required in a particular situation.
- 10.1 Calculate answers to the correct degree of precision.
  - 10.2 Calculate answers to the correct degree of precision.
  - 10.3 Calculate the greatest possible error.
  - 10.4 Demonstrate measurement using calipers and micrometers.
  - 10.5 Find the tolerance allowed for measurements.
11. Interpret scales to the degree of accuracy required in a particular situation.
- 11.1 Interpret circular scales.
  - 11.2 Interpret uniform and nonuniform scales.
  - 11.3 Demonstrate the use of the color codes in reading the value of electrical resistors.
12. Interpret graphs and charts.
- 12.1 Read data.
  - 12.2 Interpret data.
  - 12.3 Analyze data.
  - 12.4 Create graphs/charts to depict given data.
    - a. Bar
    - b. Line
    - c. Circle

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**COMPETENCIES REVIEWED AND APPROVED BY:**

**DATE:** \_\_\_\_\_

**FACULTY:**

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

Preparation

Effective date: 3/93

by: Robert Jansen

Campus: A B C U N W OC

extension: 6388

Revision(s): 3/93;