El Camino College

COURSE OUTLINE OF RECORD - Official

I. GENERAL COURSE INFORMATION

Subject and Number: **Mathematics 12**
Descriptive Title: **Basic Arithmetic Skills**

Course Disciplines: **Mathematics**

Division: **Mathematical Sciences**

Catalog Description: This introductory arithmetic course is designed to develop number and operation sense using whole numbers, fractions, decimals, and percents, as well as develop problem-solving skills. Topics include writing whole numbers and decimals in various forms, estimation, ratios, proportions, and applications.

Note: Students enrolled in this course are required to participate in individual and group activities.

Conditions of Enrollment: *You have no defined requisites.*

Course Length: [X] Full Term [ ] Other (Specify number of weeks):
Hours Lecture: 4.00 hours per week [ ] TBA
Hours Laboratory: 0 hours per week [ ] TBA
Course Units: 3.00

Grading Method: Letter
Credit Status Non-Degree Credit

Transfer CSU: [ ] No
Transfer UC: [ ] No

General Education:

El Camino College:

CSU GE:

IGETC:

II. OUTCOMES AND OBJECTIVES

A. COURSE STUDENT LEARNING OUTCOMES (The course student learning outcomes are listed below, along with a representative assessment method for each. Student learning outcomes are not subject to review, revision or approval by the College Curriculum Committee)

1. Student will be able simplify an arithmetic expression correctly by using order of operations to identify and perform the operations in a step-by-step procedure.

The above SLOs were the most recent available SLOs at the time of course review. For the most current SLO statements, visit the El Camino College SLO webpage at http://www.elcamino.edu/academics/slo/.

B. Course Student Learning Objectives (The major learning objective for students enrolled in this course are listed below, along with a representative assessment method for each)

1. Read and write whole numbers and decimal numbers in standard, expanded, and written form.

   Objective Exams

2. Order a given set of numbers.

   Objective Exams

3. Use the order of operations to add, subtract, multiply and exponentiate whole numbers, fractions and decimals.

   Objective Exams

4. Use rounding techniques to estimate results of operations on whole numbers, fractions and decimals.

   Objective Exams

5. Use divisibility tests and prime factorization to reduce fractions to lowest terms and perform operations on fractions.

   Objective Exams

6. Convert rational numbers into decimals, fractions and percentages.

   Objective Exams

7. Solve various application problems requiring the use of ratios, proportions, and percentages.

   Objective Exams

III. OUTLINE OF SUBJECT MATTER (Topics are detailed enough to enable a qualified instructor to determine the major areas that should be covered as well as ensure consistency from instructor to instructor and semester to semester.)

Lecture or Lab	Approximate Hours	Topic Number	Major Topic

Lecture	16	I	WHOLE NUMBERS
			  A. Place value system including expressing whole numbers in standard, expanded and written form
			
			  B. Addition of whole numbers
			
			  C. Subtraction of whole numbers
			
			  D. Multiplication of whole numbers
			
			  E. Division of whole numbers
			
			  F. Rounding and estimation of whole numbers
			
			  G. Powers and order of operations and ordering of whole numbers
			
			  H. Applications of whole numbers

Lecture	20	II	FRACTIONS A. Divisibility tests of whole numbers

			B. Prime factorization of whole numbers
			C. Greatest common factor of whole numbers
			D. Converting between mixed numbers and improper fractions
			E. Simplifying fractions
			F. Multiplication of fractions
			G. Division of fractions
			H. Least common multiple of whole numbers
			I. Powers, order of operations and ordering of fractions
			J. Addition and subtraction of fractions
			K. Rounding and estimation of fractions
			L. Applications of fractions
Lecture	16	III	DECIMALS A. Place value system including expressing decimals in standard and written forms B. Addition, subtractions, multiplication and division of decimals C. Rounding and estimation of decimals D. Powers, order of operations and ordering of decimals E. Converting between decimals and fractions F. Applications
Lecture	20	IV	RATIOS, PROPORTIONS AND PERCENTS A. Writing ratios and unit rates B. Solving proportions C. Conversions among percentages, fractions and decimals D. Solving percent problems of the type A = RB where A is the amount, R is the rate and B is the base E. Applications
Total Lecture Hours	72		
Total Laboratory Hours	0		
Total Hours	72		

IV. PRIMARY METHOD OF EVALUATION AND SAMPLE ASSIGNMENTS

A. **PRIMARY METHOD OF EVALUATION:**

Problem solving demonstrations (computational or non-computational)

B. **TYPICAL ASSIGNMENT USING PRIMARY METHOD OF EVALUATION:**

Place the numbers in order from the smallest to largest. Write a sentence or two justifying your final ordering. 0.4, 1/2, 55/100, 0.49

C. **COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:**

1. Ratios can be extended to include more than two numbers. For instance, the ratio of the sides of the right triangle in the diagram below (not included here, but the length of the hypotnuse is labeled H=5 and the lengths of the other sides are labeled A=3 and B=4) can be written as 3:4:5, where the length of the side of the triangle across from the right angle is 5 units, and the lengths of the other two sides are 3 units and 4 units. The triple ratio for any right triangle, A:B:H has the additiional property that $A^2+B^2=H^2$.

   (a) Find all possible triple ratios for right triangles, where the lengths of each side of the triangle is a whole numbers and the length of one of the sides is 5 (the side does not need to be the hypotnuse).

   (b) Find all possible triple ratios for right triangles, where the lengths of each side of the triangle is a whole numbers and the length of one of the sides is 7 (the side does not need to be the hypotnuse).

2. Gold jewelry comes in various colors. Three typical colors are yellow, rose and white. Use the table at the right (not included here, the table shows the composition of gold, copper, silver, palladium, nickel and zinc needed to produce each of these three colors) to figure out how many grams of each element is needed to produce 10 grams of gold of each of the three colors.

D. **OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:**

Other exams

Quizzes

Homework Problems

Other (specify):

Individual and group activities

V. INSTRUCTIONAL METHODS

Discussion

Group Activities

Lecture

Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instruction delivery shall provide access, full inclusion, and effective communication for students with disabilities.

VI. WORK OUTSIDE OF CLASS

Study

Answer questions

Skill practice

Required reading

Problem solving activities

Other (specify)

Complete group and individual activities begun in class

Estimated Independent Study Hours per Week: 5

VII. TEXTS AND MATERIALS

    A. **UP-TO-DATE REPRESENTATIVE TEXTBOOKS**
       Elayn Martin-Gay. <u>Basic College Mathematics</u>. 4th ed.   Pearson, 2011.

    B. **ALTERNATIVE TEXTBOOKS**

    C. **REQUIRED SUPPLEMENTARY READINGS**

    D. **OTHER REQUIRED MATERIALS**

VIII. CONDITIONS OF ENROLLMENT
    A.   **Requisites (Course and Non-Course Prerequisites and Corequisites)**

Requisites	Category and Justification

    B.   **Requisite Skills**

Requisite Skills

    C.   **Recommended Preparations (Course and Non-Course)**

Recommended Preparation	Category and Justification

    D.   **Recommended Skills**

Recommended Skills

    E.   **Enrollment Limitations**

Enrollment Limitations and Category	Enrollment Limitations Impact

Course created by Trudy Meyer on 09/01/2006.

BOARD APPROVAL DATE: 11/20/2006

LAST BOARD APPROVAL DATE:

Last Reviewed and/or Revised by Lars Kjeseth on 08/23/2013

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