MATH 0582 - PRE-ALGEBRA

SECTION A

1. Division:	Sciences & Mathematics
2. Subject Code:	MATH
3. Course Number:	0582
4. Course Title:	PRE-ALGEBRA
5. Semester of First Offering:	FALL 2013

SECTION B   General Course Information

1.Units: 4.0   **Variable Units:** N/A

2.This Course is: Nondegree-Applicable Credit - Basic Skills

3A. Cross-List: **3B. Formerly:**
                                             SKDV 0582

Course Format and Duration

4. Standard Term Hours per Week		5. Standard Term Total Semester Hours	
Lecture/Discussion:	3	Lecture/Discussion:	54
Lab:	3	Lab:	54
Activity:		Activity:	
By Arrangement:		By Arrangement:	
Total Hours per Week:	6	**Total Hours :**	108

6. Minimum hours per week of independent work done outside the class: 6

Course Preparation - (Supplemental form B required)

7a. Prerequisite(s): (Course and/or other preparation/experience that is <u>REQUIRED</u> to be completed previous to enrollment in this course.)

Completion of MATH 581 or 581S with grade of "C" or better or placement by matriculation assessment process

7b. Co-requisite(s): (Courses and/or other preparation that is REQUIRED to be taken concurrently with this course.)

7c. Advisory: (MINIMUM preparation RECOMMENDED in order to be succesful in this course. Also known as "Course Advisory".)

Catalog Description And Other Catalog Information:

8. Repeatability: **Not Repeatable**

Please note: Repeatability does <u>not</u> refer to repeating courses because of substandard grades or a lapse of time since the student took the course. A course may be repeated <u>only</u> if the course content differs each time it is offered and the student who repeats it is gaining an expanded educational experience as stipulated in Title V.

☐ Skills or proficiencies are enhanced by supervised repetition and practice within class periods.

☐ Active participatory experience in individual study or group assignments is the basic means by which learning objectives are attained.

☐ Course content differs each time it is offered.

Explanation for above repeatability selection:

9a. Grading Option: Standard Grade

9b. Catalog Description:

Integrates and utilizes algebraic concepts and skills, such as integers, algebraic equations, polynomials, radicals, factoring and graphing, as well as reviews whole numbers, decimals, fractions, ratio and proportions, exponential notation, percentages, basic geometry and problem solving.

Course Outline Information

10. Student Performance Objectives: (Performance objectives for all credit courses must indicate that students will learn critical thinking and will be able to apply concepts at college level.Performance objectives must be related to items listed in Section 11.)

This course requires 54 hours lecture and 54 hours laboratory. In some class sections, some or all of the 54 hours of laboratory may be scheduled "to be arranged" or "TBA." The TBA hours and objectives are expected of all students enrolled in the course.

Lecture Objectives:
1) Using mathematical operations of addition, subtraction, multiplication, and division calculate whole numbers, fractions, decimals, ratios and proportions, percentages and signed numbers problems by showing all steps.
2) Analyze, interpret, and solve whole numbers, fractions, decimals, ratios and proportions, percentages, and signed numbers word problems that are either one or multi-step problems by using logical mathematical sequence of steps.
3) Recognize and apply algorithms such as the order of operations, exponential notation, and square roots to appropriate problems and solve them showing all steps.
4) Recognize and apply mathematical terminology to the interpretations and solutions of all types of mathematical problems by demonstrating the appropriate written steps.
5) Solve one and multi-step linear equations by using the appropriate principles needed in each situation.
6) Graph linear equations on the coordinate graph when given the ordered pair and by using substitution to determine the ordered pairs.
7) Analyze, interpret, and solve basic geometry problems by using the appropriate formulas.
8) Calculate addition, subtraction, and multiplication of polynomials by using the appropriate methods.
9) Factor polynomials by using the distributive property.
10) Use the properties of exponents to simplify expressions written in exponential notation.

Laboratory/TBA Objectives:
1) Calculate and solve mathematical operations of addition, subtraction, multiplication, and division utilizing whole numbers, fractions, decimals, ratios and proportions, percentages and signed numbers problems by showing all steps.
2) Solve one or multi-step word problems using logical mathematical sequence of steps by analyzing an interpreting with whole numbers, fractions, decimals, ratios and proportions, percentages, and signed numbers.
3) Apply algorithms such as the order of operations, exponential notation, and square roots to appropriate problems and solve them showing all steps.
4) Apply mathematical terminology to the interpretations and solutions of all types of mathematical problems by demonstrating the appropriate written steps.
5) Solve one and multi-step linear equations by using the appropriate principles needed in each situation.
6) Graph linear equations on the coordinate graph when given the ordered pair and by using substitution to determine the ordered pairs.
7) Solve basic geometry problems by using the appropriate formulas.
8) Calculate polynomial problems by using the appropriate methods of addition, subtraction, and multiplication.
9) Factor polynomials by using the distributive property.
10) Simplify expressions written in exponential notation by using the properties of exponents.

11. Course Content Outline: (Provides a comprehensive, sequential outline of the course content, including all major subject matter and the specific body of knowledge covered.)

I. Whole Number Review - Calculation and Word Problem Solving
II. Introduction to Algebra: Integers - Calculation and Word Problem Solving
III. Variables and Solving Equations
IV. Rational Numbers: Positive and Negative Fractions - Calculation and Word Problem Solving
V. Exponents and Polynomials - Simplification and Calculation
VI. Rational Numbers: Positive and Negative Decimals - Calculation and Word Problem Solving
VII. Square roots and Simplifying Radicals
VIII. Graphing Linear Equations
IX. Algebraic Equations - Interpretation and Calculation
X. Ratio and Proportion - Calculation and Word Problem Solving
XI. Percentages - Calculation and Word Problem Solving

12. Typical Out-of-Class Assignments: (Credit courses **require** two hours of independent work outside of class for each lecture hour, less lab/activity classes. List type of assignments including library assignments.)

a. Reading Assignments: (Submit at least 2 examples.)
1. Read the assigned pages from the textbook and be prepared to discuss the differences between simplifying expressions and solving equations.
2. Read and follow these directions: Choose a variable to represent what is missing in the problem. Write an equation using the variable. Solve the equation.

b. Writing, Problem Solving or Performance: (Submit at least 2 examples)

1. If 5 is added to the sum of twice a number and 3 times the same number, the result is 25. What is the number?
2. Two trains leave the station at the same time but in opposite directions. The faster train travels at an average rate of 80 mph, and the slower train travels at an average rate of 70 mph. In how many hours will they be 750 miles apart?

c. Other (Term projects, research papers, porfolios, etc.)

Computerized lab program

13. Required Materials:

a. All textbooks, resources and other materials used in this course are college level?

☑   Yes

☐   No

b. Representative college-level textbooks (for degree applicable courses) or other print materials:

> **Book 1:**
>
> | | |
> |---|---|
> | **Author:** | Lial/Hestwood |
> | **Title:** | PRE ALGEBRA |
> | **Publisher:** | Pearson |
> | **Date of Publication:** | 2014 |
> | **Edition:** | 5th |

c. Other materials and/or supplies required of students:

14. Check all Instructional methods used to present course content:

☑	Lecture	☐	Activity
☑	Discussion Semminar	☐	Distance Education (requires supplemental form)
☑	Lab	☐	Work Experience
☑	Directed Study	☑	Tutoring

Other: Computers

Give detailed examples of teaching methodology that relate to the course performance objectives:

1. Instructor presents a lecture/discussion of analyzing and solving basic geometry problems by using the appropriate formulas. Application problems will be discussed and analyzed. The instructor will then form small groups to enable students to work together through an application problem of the presented concept. Students will then either submit their work in written form or will present their work to the rest of the class. Instructor will encourage students to follow up the discussion with homework on the computer and monitors the student responses.

2. Instructor will present a lecture with examples of the key components needed to solve word problems. The instructor will guide the student to read through a word problem, determine what is being asked for or what is missing, identify the steps necessary to model the problem and determine the solution. Instructor prepares the lecture and examples, writes the associated test questions and scores the test for correct understanding of the concepts and reviews these with students.

15. Methods of Assessing Student Learning

15a. Methods of Evaluation:

☐	Essay Exam	☐	Reports
☐	Objective Exam	☑	Problem Solving Exam
☐	Projects	☑	Skill Demonstration
☑	Class Discussion	☐	Other

15b. (All courses must provide for measurement of student performance in terms of stated student performance objectives, Area 10, and culminate in a formal recorded grade based on uniform standards. Submit at least 2 examples.)

1. Objective: Calculate using the mathematical operations of addition, subtraction, multiplication, and division for problems involving variables. Students will take a test involving the basic operations for algebraic expressions. The tests will be scored, assigned a grade on a traditional grading scale, and reviewed in class. Study guides and reviews are provided prior to the exam.

2. Objective: Recognize and apply algorithms for the order of operations. Students will complete a project utilizing the order of operations. Part one of the project will involve simplifying model examples for the concept. Part 2 of the project will be to identify common errors encountered when simplifying math problems involving the order of operations. Scores will be assigned for the project using a traditional grading scale. In addition, a quiz will be scored, assigned a grade, and reviewed in class.

SECTION C

1. Program Information:
- ☐ In an approved program
- ☐ Part of a new program
- ☒ Not part of an approved program

2. TOP Code Information

Program Title: Mathematics, General 170100

3. Course SAM Code:
- ☐ A - Apprenticeship Course
- ☐ B - Advanced Occupational
- ☐ C - Clearly Occupational
- ☐ D - Possibly Occupational
- ☒ E - Non-Occupational

4. Faculty Minimum Qualifications/Degrees:

Education
Learning Assistance Instructors
Mathematics

Comments:

SECTION D

General Education Information:

1. College Associate Degree GE Applicability:

2. CSU GE Applicability:

3. IGETC Applicability:

4. CAN :

5. LDTP:

SECTION E

1. Articulation Information: (Required for Transferable Courses Only)
- ☐ CSU Transferable
- ☐ UC Transferable
- ☐ CSU/UC Major Requirement.

If CSU/UC major requirement, list campus and major. (Note: Must be lower division)

2. List at least one community college and its comparable course. If requesting CSU and/or UC transferability also list a CSU/UC
campus and comparable lower division course

SECTION F

Planning and Resources: Please address the areas below:

1. Evidence of Need or Potential: recommendations of advisory committee, connection to existing or planned degrees/certificates, or regional/national developments, transfer university requirements.

Math 582 is the prerequisite for the Math A class.

2. Appropriateness to Mission: connection to basic skills, transfer, career technical education, or lifelong learning; relationship

This course relates directly to the Sierra College Mission, especially as it, "provides a challenging and supportive learning environment for students having diverse goals, abilities, and needs". It is designed to help support students toward transfer level courses in Math.

3. Place in Program/Department: relationship to student learning outcomes identified by program, connection to general education, or articulation with other institutions.

Basic skills class, designed to help move students toward math courses that will meet transfer requirements. Linked to student learning outcomes in the Math Department.

4. Availability of Faculty and Facilities: minimum qualifications to teach course, special training for instructors, or long-term physical impact of course.

High Availability

5. Potential Impact on Resources: impact on library, computer support, transportation, equipment, or other needs

None

SECTION G

1. Maximum Class Size (recommended):   30

2. If recommended class size is not standard, then provide rationale: