



**COWLEY COLLEGE
& Area Vocational Technical School**

COURSE PROCEDURE FOR

<p>PRE-ALGEBRA MATH EBM4401 3 Credit Hours</p>

Student Level:

This course is open to students on the college level in their freshman year.

Catalog Description:

EBM4401 - PRE-ALGEBRA MATHEMATICS (3 hrs)

This course will include arithmetic with fractions, decimals, percents, introduction to the metric system, and applications to measurement and consumer math. This course does not fulfill AS, AA, AAS, or AGS math degree requirement.

Prerequisites:

None

Controlling Purpose:

This course is designed to provide a thorough study in the arithmetic of whole numbers and fractions with elementary applications in consumer math and measurements.

Learner Outcomes:

Upon completion of this course the student who completes this course with a grade of A or B should have sufficient background to enter an introductory level algebra course (such as EBM4405 Beginning Algebra).

Units Outcomes and Criterion Based Evaluation Key for Core Content:

The following defines the minimum core content not including the final examination period. Instructors may add other content as time allows.

Evaluation Key:

- A = All major and minor goals have been achieved and the achievement level is considerably above the minimum required for doing more advanced work in the same field.
- B = All major goals have been achieved, but the student has failed to achieve some of the less important goals. However, the student has progressed to the point where the goals of work at the next level can be easily achieved.
- C = All major goals have been achieved, but many of the minor goals have not been achieved. In this grade range, the minimum level of proficiency represents a person who has achieved the major goals to the minimum amount of preparation necessary for taking more advanced work in the same field, but without any major handicap of inadequacy in his background.

- D = A few of the major goals have been achieved, but the student's achievement is so limited that he is not well prepared to work at a more advanced level in the same field.
- F = Failing, will be computed in GPA and hours attempted.
- N = No instruction or training in this area.

CHAPTER 1: WHOLE NUMBERS							SECTION 1.1 – 1.5	
Outcomes: Given a whole number of from 4 to 7 digits, the student will be able to successfully use whole numbers.								
A	B	C	D	F	N		Specific Competencies	
							Demonstrate the ability to:	
						1.1	Recognize order relations between whole numbers.	
						1.1	Recognize place value.	
						1.1	Perform rounding.	
						1.1	Use applications and statistical graphs.	
						1.2	Perform addition of whole numbers.	
						1.2	Perform subtraction of whole numbers.	
						1.2	Set up and solve application and formula problems.	
						1.3	Perform multiplication of whole numbers.	
						1.3	Recognize exponents.	
						1.3	Perform division of whole numbers.	
						1.3	Write factors and prime factorization.	
						1.3	Set up and solve application and formula problems.	
						1.4	Solve equations.	
						1.4	Use applications and formulas.	
						1.5	Recognize and use The Order of Operations Agreement.	

CHAPTER 2: INTEGERS**SECTION 2.1 –2.5**

Outcomes: Upon completion of this unit the student will be able to compute using integers.

A	B	C	D	F	N		Specific Competencies Demonstrate the ability to:
						2.1	Order integers on the number line.
						2.1	Find opposites.
						2.1	Find absolute value.
						2.1	Set up and solve application problems.
						2.2	Add integers
						2.2	Subtract integers
						2.2	Set up and solve application and formula problems.
						2.3	Multiply integers
						2.3	Divide integers
						2.3	Set up and solve application problems.
						2.4	Solve equations.
						2.4	Set up and solve application and formula problems.
						2.5	Use The Order of Operations Agreement.

CHAPTER 3: FRACTIONS**SECTION 3.1 – 3.6**

Outcomes: Upon completion of this unit, the student will be able to compute fraction problems involving addition and subtraction.

A	B	C	D	F	N		Specific Competencies
							Demonstrate the ability to:
						3.1	Find the least common multiple.
						3.1	Find the greatest common factor.
						3.1	Solve application problems.
						3.2	Recognize and write proper fractions, improper fractions, and mixed numbers.
						3.2	Write equivalent fractions.
						3.2	Use order relations between two fractions.
						3.2	Solve application problems.
						3.3	Perform addition of fractions.
						3.3	Perform subtraction of fractions.
						3.3	Set up and solve application and formula problems.
						3.4	Perform multiplication of fractions.
						3.4	Perform division of fractions.
						3.4	Set up and solve application and formula problems.
						3.5	Solve equations.
						3.5	Solve application problems.
						3.6	Simplify numbers with exponents.
						*3.6	Simplify complex fractions.

CHAPTER 3: FRACTIONS**SECTION 3.1 – 3.6**

Outcomes: Upon completion of this unit, the student will be able to compute fraction problems involving addition and subtraction.

A	B	C	D	F	N		Specific Competencies Demonstrate the ability to:
						3.6	Use The Order of Operations Agreement.

CHAPTER 4: DECIMALS AND REAL NUMBERS**SECTION 4.1 – 4.5**

Outcomes: Upon completion of the unit, the student will be able to compute decimal problems involving addition and subtraction.

A	B	C	D	F	N		Specific Competencies Demonstrate the ability to:
						4.1	Recognize place value.
						4.1	Recognize order relations between decimals.
						4.1	Perform rounding.
						4.1	Set up and solve application problems.
						4.2	Perform addition and subtraction of decimals.
						4.2	Perform multiplication of decimals.
						4.2	Perform division of decimals.
						4.2	Make conversions between fractions and decimals.
						4.2	Set up and solve application and formula problems.
						4.3	Solve equations.
						4.3	Set up and solve application problems.
						*4.4	Find square roots of perfect squares.
						*4.4	Find square roots of whole numbers.

CHAPTER 4: DECIMALS AND REAL NUMBERS**SECTION 4.1 – 4.5**

Outcomes: Upon completion of the unit, the student will be able to compute decimal problems involving addition and subtraction.

A	B	C	D	F	N		Specific Competencies Demonstrate the ability to:
						*4.4	Set up and solve application and formula problems.
						*4.5	Real numbers and the real number line.
						*4.5	Solve inequalities in one variable.
						*4.5	Set up and solve application problems.

CHAPTER 5: VARIABLE EXPRESSIONS**SECTION 5.1 – 5.7**

Outcomes: Upon completion of this unit, the student will be able to consider the manipulation of algebraic expressions and then use the manipulations to solve equations and problems.

A	B	C	D	F	N		Specific Competencies Demonstrate the ability to:
						5.1	Application of the Properties of Real Numbers
						5.1	Perform The Distributive Property.
						5.2	Combine of like terms.
						5.2	Simplify general variable expressions.
						*5.3	Add and subtract polynomials.
						*5.3	Set up and solve application problems.
						*5.4	Multiply monomials.
						*5.4	Set up and simplify powers of monomials.
						*5.5	Multiply a polynomial by a monomial.

CHAPTER 5: VARIABLE EXPRESSIONS**SECTION 5.1 – 5.7**

Outcomes: Upon completion of this unit, the student will be able to consider the manipulation of algebraic expressions and then use the manipulations to solve equations and problems.

A	B	C	D	F	N		Specific Competencies Demonstrate the ability to:
						*5.5	Multiply two binomials.
						*5.6	Divide monomials.
						*5.6	Express numbers in scientific notation.
						*5.7	Translate a verbal expression into variable expressions.
						*5.7	Translate and simplify verbal expressions.
						*5.7	Set up and solve application problems.

CHAPTER 6: FIRST-DEGREE EQUATIONS**SECTION 6.1 – 6.6**

Outcomes: Upon completion of this unit, the student will be able to recognize and simplify variable expressions.

A	B	C	D	F	N		Specific Competencies Demonstrate the ability to:
						6.1	Solve equations of the form $x + a = b$.
						6.1	Solve equations of the form $ax = b$.
						6.2	Solve equations of the form $ax + b = c$.
						6.2	Set up and solve application problems.
						6.3	Solve equations of the form $ax + b = cx + d$.
						6.3	Solve equations with parentheses.
						6.3	Set up and solve application problems.

CHAPTER 6: FIRST-DEGREE EQUATIONS**SECTION 6.1 – 6.6**

Outcomes: Upon completion of this unit, the student will be able to recognize and simplify variable expressions.

A	B	C	D	F	N		Specific Competencies Demonstrate the ability to:
						6.4	Translate a sentence into an equation and solve.
						6.4	Set up and solve application problems.
						6.5	Plot points on the rectangular coordinate system
						6.5	Plot points on a scatter diagram.
						6.6	Find solutions of linear equations in two variables.
						6.6	Graph equations of the form $y = mx + b$.

CHAPTER 7: MEASUREMENT AND PROPORTION**SECTION 7.1 – 7.5**

Outcomes: Upon completion of this unit, the student will be able to recognize different systems of measurement and compute problems involving ratios, rates and proportions.

A	B	C	D	F	N		Specific Competencies Demonstrate the ability to:
						7.1	Convert units in the metric system.
						7.2	Compare and simplify ratios and rates.
						7.3	Convert units in The U.S. Customary System of Measurement.
						7.3	Solve and set up application problems.
						7.3	Convert between the U.S. Customary System and the metric system.
						7.4	Set up and solve proportion problems.
						7.4	Set up and solve application problems.

CHAPTER 7: MEASUREMENT AND PROPORTION**SECTION 7.1 – 7.5**

Outcomes: Upon completion of this unit, the student will be able to recognize different systems of measurement and compute problems involving ratios, rates and proportions.

							Specific Competencies
							Demonstrate the ability to:
						*7.5	Set up and solve direct variation problems.
						*7.5	Set up and solve inverse variation.

CHAPTER 8 PERCENT**SECTION 8.1 – 8.5**

Outcomes: Upon completion of this unit, the student will be able to compute percent and decimal problems involving multiplication and division.

A	B	C	D	F	N		Specific Competencies
							Demonstrate the ability to:
						8.1	Write percents as decimals or fractions.
						8.1	Write fractions and decimals as percents.
						8.2	Set up and solve the basic percent equation.
						8.2	Set up and solve percent problems using proportions.
						8.2	Set up and solve application problems.
						8.3	Calculate the percent of increase and decrease.
						8.4	Calculate problems involving markup and discount.
						8.5	Set up and solve problems involving simple interest.

CHAPTER 9: GEOMETRY**SECTION 9.1 – 9.5**

Outcomes: Upon completion of this unit, the student will be able to compute problems involving perimeter, area, length and volume

A	B	C	D	F	N		Specific Competencies Demonstrate the ability to:
						9.1	Solve problems involving lines and angles.
						9.1	Solve problems involving angles formed by intersecting lines.
						9.1	Solve problems involving the angles of a triangle.
						9.2	Find perimeter of a plane geometric figure.
						9.2	Find area of a plane geometric figure.
						*9.3	Use the Pythagorean Theorem.
						*9.3	Recognize similar triangles.
						*9.3	Recognize congruent triangles.
						9.4	Find volume of a solid.
						9.4	Find surface area of a solid.
						*9.5	Find perimeter of a composite plane figure.
						*9.5	Find area of a composite plane figure.
						*9.5	Find volume of a composite solid.
						*9.5	Find surface area of a composite solid.

CHAPTER 10: STATISTICS AND PROBABILITY**SECTION 10.1 – 10.3**

Outcomes: Upon completion of this unit, the student will be able to compute problems involving descriptive statistics.

A	B	C	D	F	N		Specific Competencies Demonstrate the ability to:
						*10.1	Frequency distributions
						*10.1	Histograms
						*10.1	Frequency polygons
						10.2	Find the mean, median and mode of a distribution
						10.2	Interpret box-and-whiskers plots.
						10.2	Find the standard deviation of a distribution.
						*10.3	Find the probability of simple events.
						*10.3	The odds of an event

Projects Required:

None

Textbook:

Contact Bookstore for current textbook.

Materials/Equipment Required:

- Micro computerized drill and practice software, video tape, audio tapes, worksheets and other aids are accessible to the student in the Learning Skills Lab.
- The use of calculators in this course is not permitted, except for the unit covering Geometry.

Attendance Policy:

Students should adhere to the attendance policy outlined by the instructor in the course syllabus.

Grading Policy:

A minimum 40% of the course grade shall consist of proctored assessment(s) of which at least 20% of the course grade shall include a comprehensive departmental final exam.

Maximum Class Size:

Based on classroom occupancy

Course Timeframe:

The U.S. Department of Education, Higher Learning Commission and the Kansas Board of Regents define credit hour and have specific regulations that the college must follow when developing, teaching and assessing the educational aspects of the college. A credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally-established equivalency that reasonably approximates not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work for approximately fifteen weeks for one semester hour of credit or an equivalent amount of work over a different amount of time. The number of semester hours of credit allowed for each distance education or blended hybrid courses shall be assigned by the college based on the amount of time needed to achieve the same course outcomes in a purely face-to-face format.

Refer to the following policies:

[402.00 Academic Code of Conduct](#)

[263.00 Student Appeal of Course Grades](#)

[403.00 Student Code of Conduct](#)

Disability Services Program:

Cowley College, in recognition of state and federal laws, will accommodate a student with a documented disability. If a student has a disability which may impact work in this class which requires accommodations, contact the Disability Services Coordinator.