

# EASTERN ARIZONA COLLEGE

## College Mathematics

Course Design

2017-2018

### Course Information

**Division** Mathematics  
**Course Number** MAT 140/SUN# MAT 1142  
**Title** College Mathematics  
**Credits** 3  
**Developed by** Adam Stinchcombe  
**Lecture/Lab Ratio** 3 Lecture/0 Lab

### Transfer Status

ASU	NAU	UA
MAT 142, Mathematics (MA)	MAT 114; Foundation Requirement [FNRQ]  NAU Personalized Learning: MATH 115; Foundation Requirement [FNRQ]	MATH 105

**Activity Course** No  
**CIP Code** 27.0101  
**Assessment Mode** Pre/Post Test (11 Questions/100 Points)  
**Semester Taught** Fall and Spring  
**GE Category** Mathematics  
**Separate Lab** No  
**Awareness Course** No  
**Intensive Writing Course** No

### Prerequisites

MAT 077 or higher with a grade of "C" or higher or placement test score as established by District policy and ENG 091 with a grade of "C" or higher or reading placement test score as established by District policy

### Educational Value

Intended to provide students with a working knowledge of college level mathematics and its applications to real life situations.

### Description

Applications of mathematics to real life situations. Quantitative methods including probability, statistics, geometry, algebra, and exponential functions will be used to analyze concepts and applications from business, social sciences, the physical sciences, and the mathematics of finance. Recommend completion of at least two years of high school algebra. Appropriate for students whose major does not require any Calculus.

## **Supplies**

Scientific calculator

### **Competencies and Performance Standards**

#### **1. Counting – Apply techniques, combinatorics, permutations, and combinations to the solving of problems.**

##### **Learning objectives**

*What you will learn as you master the competency:*

- a. Distinguish a permutation question from a combination question.
- b. Calculate permutations and combinations.
- c. Use combinations to find probabilities.
- d. Distinguish events as conditional independent or mutually exclusive.
- e. Use tree diagrams.

##### **Performance Standards**

*You will demonstrate your competence:*

- o on assigned activities
- o on written exams
- o on a two-hour cumulative exam

*Your performance will be successful when:*

- o learner can indicate whether a given event is conditional independent or mutually exclusive
- o learner can correctly calculate combinations and permutations

#### **2. Probability – Examine the terms, rules, and applications in daily life and decision-making.**

##### **Learning objectives**

*What you will learn as you master the competency:*

- a. Calculate the probability and the odds of a given event.
- b. Calculate the relative frequency of an event and explain the meaning.
- c. Apply basic probability rules to a variety of problems.
- d. Calculate an expected value for an event and state if it would be wise or unwise to pursue the event.
- e. Construct Venn diagrams.
- f. Calculate binomial probabilities.

##### **Performance Standards**

*You will demonstrate your competence:*

- o on assigned activities
- o on written exams
- o on a two-hour cumulative exam

*Your performance will be successful when:*

- o learner calculates the probability and the odds of a given event
- o learner calculates the relative frequency of an event and explains the meaning
- o learner applies basic probability rules to a variety of problems
- o learner calculates an expected value for an event and states if it would be wise or unwise

- o to pursue the event
- o learner constructs Venn diagrams
- o learner calculates binomial probabilities

**3. Statistics – Apply statistical techniques and data to find measures of central tendency, dispersion, and normal distributions.**

***Learning objectives***

*What you will learn as you master the competency:*

- a. Define the meanings of population, sample and data as used in the study of statistics.
- b. Calculate the three measures of central tendency, (mean, median, mode), from a given list of data.
- c. Calculate measures of dispersion, (variance, standard deviation) from a given list of data.

***Performance Standards***

*You will demonstrate your competence:*

- o on assigned activities
- o on written exams
- o on a two-hour cumulative exam

*Your performance will be successful when:*

- o learner can, from a given set of data, calculate the measure of central tendency and dispersion

**4. Finance – Apply finance formulas to answer questions concerning simple interest, compound interest annuities, and amortized loans.**

***Learning objectives***

*What you will learn as you master the competency:*

- a. Model exponential vs linear growth.
- b. Select correct formulas for figuring simple interest, compound interest, annuities, and amortized loans.
- c. Apply correct formulas to figure simple interest, compound interest, annuities, and amortized loans.
- d. Use logarithms to solve for an unknown exponent.

***Performance Standards***

*You will demonstrate your competence:*

- o on assigned activities
- o on written exams
- o on a two-hour cumulative exam

*Your performance will be successful when:*

- o learner can solve for an unknown in an exponential growth model
- o learner can calculate simple interest applications involving credit card finance charges
- o learner can calculate compound interest applications
- o learner can correctly calculate annuities, sinking funds, and the present value of an annuity
- o learner can correctly calculate a partial amortization schedule and find an unpaid balance

**5. Geometry – Apply geometric formulas and ideas to solve problems.**

***Learning objectives***

*What you will learn as you master the competency:*

- a. Understand the basic properties of geometric objects (points, lines, and planes).
- b. Use properties of angles.
- c. Solve problems involving angles, arcs, and circles.
- d. Solve problems involving polygons.
- e. Calculate the perimeter and area of geometric objects.
- f. Use the Pythagorean Theorem to solve right triangle problems.

***Performance Standards***

*You will demonstrate your competence:*

- o on assigned activities
- o on written exams
- o on a two-hour cumulative exam

*Your performance will be successful when:*

- o learner can correctly solve problems involving angles, arcs, and circles
- o learner can correctly solve problems involving perimeter and area
- o learner can correctly solve problems involving polygons
- o learner can correctly solve problems using the Pythagorean Theorem

***Types of Instruction***

Classroom presentation

***Grading Information***

***Grading Rationale***

Each instructor has the flexibility to develop evaluative procedures within the following parameters.

1. Written exams must represent at least 50% of the final course grade.
2. Final exam must represent at least 20% of the final course grade.
3. The Post Test is to be embedded in the final exam and must represent at least 10% of the final course grade.
4. Other activities (homework, attendance, presentations, papers, worksheets, projects, classroom participation) may represent at most 30% of the final course grade.

***Grading Scale***

- A 90%-100%
- B 80%-89%
- C 70%-79%
- D 60%-69%
- F Below 60%