Palo Verde College
One College Drive, Blythe CA 92225
(760) 921-5500

| Course Control Number: CCC000599901 | | |
|---|---|---|
| Course Outline Approval Dates | | |
| Modality | Curriculum Committee | Board of Trustees |
| Face-to-face | 12/13/2018 | 01/22/2019 |
| Correspondence Ed. | 12/13/2018 | 01/22/2019 |
| Distance Ed. | | |

# COURSE OUTLINE OF RECORD

## Course Information

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|---|---|---|---|---|
| Course Initiator: Sandra Sher | | | | |
| CB01 - Subject and Course #: MAT 108 | | | | |
| CB02 - Course Title: Liberal Arts Mathematics | | | | |
| New Course: ☐ | Non-Substantial: ☐ | Substantial: ☒ | | |
| Articulation Request: ☒ UC | ☒ CSU | ☒ CSU-GE | ☒ IGETC | |
| Lecture Hours: 54 | Laboratory Hours: | Clinical/Field Hours: | | |
| CB06/CB07: Course Units: 3.0 | | | | |
| Prerequisites: | Completion of MAT 086/088 Intermediate Algebra or appropriate placement based on AB 705 mandates. | | | |
| Co-requisites: | | | | |
| Advisories: | Students with HS GPA below 3.0 are recommended to take concurrently with MAT 090. | | | |

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| CB03 - TOP Code: | 1701.00 - Mathematics, General |
| CB04 - Credit Status: | D - Credit - Degree Applicable |
| CB05 - Transfer Status: | A - Transferable to both UC and CSU |
| CB08 - Basic Skills Status: | N - Course is not a basic skills course |
| CB09 - SAM Priority Code: | E - Non-Occupational |
| CB10 - Cooperative Work: | N - Is not part of Cooperative Work Experience Education Program |
| CB11 - Course Classification: | Y - Credit Course |
| CB13 - Approved Special: | N - Course is not a special class |
| CB21 - Prior Transfer Level: | Y - Not Applicable |
| CB22 - Noncredit Category: | Y - Credit Course |
| CB23 - Funding Agency: | Y - Not Applicable |
| CB24- Program Status: | 1 - Program Applicable |
| Transfer Request: | A= UC and CSU |

Please select the appropriate box(s) of the modalities in which this course will be offered, and fill out the appropriate sections for that mode.

☒ Face-to-Face – Section B
☒ Correspondence Education – Section C
☐ Distance Education – Section D

## JUSTIFICATION OF NEED:

Provides an alternative college-level quantitative reasoning course.

## CATALOG DESCRIPTION:

This course focuses on the development of quantitative reasoning skills through in-depth , integrated explorations of topics in mathematics, including real number systems and subsystems. Emphasis is on comprehension and analysis of mathematical concepts and applications of logical reasoning.

## COURSE OBJECTIVES:

1. Perform operations on sets such as determining the intersection, union, and complement of sets.
2. Find subsets and draw Venn diagrams.
3. Construct truth tables to determine if statements are logically equivalent and if a statement is a tautology.
4. Determine the truth value of a statement.
5. Find the converse, inverse, contrapositive, of a conditional statement.
6. Decide whether an argument is valid.
7. Use direct reasoning and indirect reasoning as appropriate.
8. Avoid logical fallacies.
9. Describe and use early numeration systems.
10. Calculate using modular arithmetic.
11. Calculate terms in Arithmetic and Geometric sequences and series.
12. Determine whether a sequence is a Fibonacci sequence.
13. Calculate interest and determine the economic consequences of installment buying.
14. Perform transformations on geometric figures and determine their symmetries.
15. Find the reflection of a point.
16. Recognize when two geometric figures are topologically equivalent.
17. Find the golden ratio.
18. Decide whether a network is traversable.
19. Calculate lengths, areas, and volumes using the metric system.
20. Determine whether events are independent.
21. Decide when to use permutations and combinations.
22. Construct and interpret histograms.
23. Calculate measures of central tenancy.

## STUDENT LEARNING OUTCOMES:

1. Use truth tables to determine if a statement is a tautology.
2. Calculate the probabilities, odds, expected values, and conditional probabilities.

## A. COURSE OUTLINE AND SCOPE

### 1. Outline of topics or content:

1. The nature of sets.
a. Sets, subsets, and Venn diagrams.
b. Operations with sets.
c. Applications of sets.
d. Finite and infinite sets.
2. The nature of logic.
a. Deductive reasoning.
b. Truth tables and the conditional.

c. Operators and laws of logic.
d. The nature of proof.
e. Problem solving using logic.
3. The nature of numeration systems.
a. Early numeration systems.
b. Hindu-Arabic numeration system.
c. Different numeration systems.
d. Binary numeration system.
4. The nature of numbers.
a. Discrete mathematics (modular arithmetic).
5. The nature of geometry.
a. Golden rectangles.
b. Projective and non- Euclidean geometries.
6. The nature of networks and graph theory.
a. Topology.
b. Konigsberg bridge problem.
c. Networks.
7. The nature of measurement.
a. Area.
b. Volume, capacity.
c. Miscellaneous measurements.
d. Metric system.
8. The nature of financial management.
a. Interest.
b. Installment buying.
c. Sequences - arithmetic, geometric, Fibonacci.
d. Finance.
e. Amortization.
9. The nature of counting.
a. Permutations.
b. Combinations.
10. The nature of probability.
a. Introduction to probability.
b. Mathematical Expectation.
c. Probability models.
d. Calculated probabilities.
11. The nature of statistics.
a. Frequency distributions and graphs.
b. Descriptive statistics.
c. The normal curve.
d. Correlation and regression.

**2. If a course contains laboratory or clinical/field hours, list examples of activities or topics:**

**3. Examples of reading assignments:**

May use textbook. Online reading may be required for face to face students.

**4. Examples of writing assignments:**

Homework, group quizzes, tests, final exam may be used.

**5. Appropriate assignments to be completed outside of class:**

Homework problems.

**6. Appropriate assignments that demonstrate critical thinking:**

1. Determining if an argument is valid.
2. Calculating the probability that a card is a jack given that it is a red card.

**7. Other assignments (if applicable):**

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☐ Check if Section B is not applicable

**B. FACE-TO-FACE COURSE SECTIONS:**

**Face-to-face education**
Is a mode of delivery in which instruction is delivered in a traditional classroom setting, with instructor and students located simultaneously in the same classroom facility.

**1. Describe the methods of instruction:**

May include, but not be limited to, lecture, homework, tests, quizzes.

**2. Describe the methods of evaluating of student performance.**

May include, but not be limited to, computer work, quizzes, homework, tests.

**3. Describe how the confidentiality of the student's work and grades will be maintained.**

Instructors shall make reasonable efforts to protect the confidentiality of students' grades and graded work consistent with practices described in the Family Education Rights and Privacy Act (FERPA).

**4. If the course has a lab component, describe how lab work is to be conducted and how student work is to be evaluated.**

NOTE: Students will be encouraged by instructors of this course to direct themselves to the College's Disabled Students' Programs and Services (DSP&S) department if they believe they have a learning disability.

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☐ Check if Section C is not applicable

**C. CORRESPONDENCE EDUCATION COURSE SECTIONS (Correspondence, hybrid correspondence)**

**Correspondence education**
is a mode of delivery in which instructional materials are delivered by mail, courier or electronic transmission to students who are separated from the instructor by distance. Contact between instructor and students is asynchronous.
**Hybrid correspondence education**
is the combination of correspondence and face-to-face interaction between instructor and student.

**1. Describe the methods of instruction.**

May include, but not be limited to, homework, quizzes, tests, final exam.

**2. Describe the methods of evaluating student performance.**

May include, but not be limited to, homework, quizzes, tests, final exam.

**3. Describe how regular, effective contact between the instructor and a student is maintained.**

Regular, effective contact includes, but is not limited to, exams; quizzes; graded homework assignments; syllabus receipt; office hours; instant messaging; and synchronous online discussions, e-mails, letters, notes, phone calls, or postings on the CANVAS between instructor and student.

**4. Describe procedures that help verify the individual submitting class work is the same individual enrolled in the course section.**

Consistent with policy elements listed in the ACCJC's "Policy on Distance Education and on Correspondence Education," the College verifies the identity of a student who participates in class or coursework by using, at the College's discretion, such methods as a secure log-in and password, proctored examinations, or other technologies or practices that are developed and effective in verifying each student's identification.

**5. Describe procedures that evaluate the readiness of a student to succeed in a correspondence or hybrid correspondence course section.**

The procedure might consist of a short assessment questionnaire prepared by the instructor and self-administered by the student. The questionnaire would evaluate areas such as working independently, adhering to timelines, and familiarity with working online and with computer technology. The student would use the resulting score to evaluate his or her readiness to take the course in a

correspondence or hybrid correspondence instructional mode.

**6. Describe how the confidentiality of the student's work and grades will be maintained.**

Instructors shall make reasonable efforts to protect the confidentiality of students' grades and graded work consistent with practices described in the Family Education Rights and Privacy Act (FERPA).

**7. If the course has a lab component, describe how lab work is to be conducted and how student work is to be evaluated.**

**8. If the course requires specialized equipment, including computer and computer software or other equipment, identify the equipment, and describe how it is to be accessed by students.**

Note: Students will be encouraged by instructors of this course to direct themselves to the College's Disabled Students' Programs and Services (DSP&S) department if they believe they have a learning disability.

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☒ Check if Section D is not applicable

**D. DISTANCE EDUCATION COURSE SECTIONS (online, ITV, hybrid)**

**Online education**
is a mode of delivery in which all instruction occurs online via the Internet. Student and instructor access to email and the Internet is required. Students are required to complete class work using email, chat rooms, discussion boards and other instructional online venues.

**Interactive television (ITV)**
is a mode of synchronous delivery in which instruction occurs via interactive television (closed circuit).

**Hybrid instruction**
is a combination of face-to-face instruction and online instruction.

**1. Describe the methods of instruction.**

**2. Describe the methods of evaluating of student performance**.

**3. Describe how regular, effective contact between the instructor and a student is maintained.**

**4. Describe procedures that help verify the individual submitting class work is the same individual enrolled in the course section.**

**5. Describe procedures that evaluate the readiness of a student to succeed in an online, ITV or hybrid course section.**

**6. Describe how the confidentiality of the student's work and grades will be maintained.**

**7. If the course has a lab component, describe how lab work is to be conducted and how student work is to be evaluated.**

**8. If the course requires specialized equipment, including computer and computer software or other equipment, identify the equipment, and describe how it is to be accessed by students.**

Note: Students will be encouraged by instructors of this course to direct themselves to the College's Disabled Students' Programs and Services (DSP&S) department if they believe they have a learning disability.

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**E. REPRESENTATIVE TEXTBOOKS AND OTHER READING AND STUDY MATERIALS:**
**List author, title, and current publication date of all representative materials.**

The Nature of Mathematics, 13th Edition by Karl J. Smith, 2017

**SIGNATURES**

**COURSE INITIATOR: _____ DATE: _____**

**DIVISION CHAIR: _____ DATE: _____**

**LIBRARY: _____ DATE: _____**

**CHAIR OF CURRICULUM COMMITTEE: _____ DATE: _____**

**SUPERINTENDENT/PRESIDENT: _____ DATE: _____**