MATH R104: MATHEMATICS FOR SOCIETY AND THE ARTS

Originator
ptrujillo

College
Oxnard College

Discipline (CB01A)
MATH - Mathematics

Course Number (CB01B)
R104

Course Title (CB02)
Mathematics for Society and the Arts

Banner/Short Title
Math for Society and the Arts

Credit Type
Credit

Start Term
Fall 2023

Catalog Course Description
This course introduces mathematical ideas and tools used to solve practical problems including logic, sets, numbers, financial calculations, probability, statistics and mathematics in politics, society and the arts. Students majoring in General Studies, Art, and other non-BSTEM majors (Chicana/o Studies, Deaf Studies, English, History, Philosophy, Spanish or many career education majors) that do not require statistics will find this to be an ideal course for meeting mathematics competency and general education requirements for graduation or transfer.

Taxonomy of Programs (TOP) Code (CB03)
1701.00 - Mathematics, General

Course Credit Status (CB04)
D (Credit - Degree Applicable)

Course Transfer Status (CB05) (select one only)
B (Transferable to CSU only)

Course Basic Skills Status (CB08)
N - The Course is Not a Basic Skills Course

SAM Priority Code (CB09)
E - Non-Occupational

Course Cooperative Work Experience Education Status (CB10)
N - Is Not Part of a Cooperative Work Experience Education Program

Course Classification Status (CB11)
Y - Credit Course

Educational Assistance Class Instruction (Approved Special Class) (CB13)
N - The Course is Not an Approved Special Class

Course Prior to Transfer Level (CB21)
Y - Not Applicable

Course Noncredit Category (CB22)
Y - Credit Course

Funding Agency Category (CB23)
Y - Not Applicable (Funding Not Used)

Course Program Status (CB24)
1 - Program Applicable

General Education Status (CB25)
B - Satisfies Math/Quantitative Reasoning req (CSUGE-B B4, IGETC 2, or 4-yr)

Support Course Status (CB26)
N - Course is not a support course

Field trips
Will not be required

Grading method
(L) Letter Graded

Alternate grading methods
(O) Student Option- Letter/Pass
(P) Pass/No Pass Grading

Does this course require an instructional materials fee?
No

Repeatable for Credit
No

Is this course part of a family?
No

Units and Hours

Carnegie Unit Override
No

In-Class

Lecture
Minimum Contact/In-Class Lecture Hours
52.5
Maximum Contact/In-Class Lecture Hours
52.5

Activity

Laboratory

Total in-Class

Total in-Class
Total Minimum Contact/In-Class Hours
52.5
Total Maximum Contact/In-Class Hours
52.5

Outside-of-Class

Internship/Cooperative Work Experience

Paid

Unpaid

Total Outside-of-Class

Total Outside-of-Class
Minimum Outside-of-Class Hours
105
Maximum Outside-of-Class Hours
105

Total Student Learning

Total Student Learning
Total Minimum Student Learning Hours
157.5
Total Maximum Student Learning Hours
157.5

Minimum Units (CB07)
3
Maximum Units (CB06)
3

Prerequisites
Course taught at the level of intermediate algebra or placement as determined by the college's multiple measures assessment process.

Entrance Skills
Entrance Skills
Algebraic fluency with expressions and equations. Understanding functions and graphs.

Requisite Justification
Requisite Type
Prerequisite

Requisite
Course taught at the level of intermediate algebra or placement as determined by the college's multiple measures assessment process

Requisite Description
Course in a sequence

Level of Scrutiny/Justification
Content review

Student Learning Outcomes (CSLOs)

	Upon satisfactory completion of the course, students will be able to:
1	Identify and interpret valid statistical analysis.
2	Identify and interpret linear/exponential growth and decay.

Course Objectives

	Upon satisfactory completion of the course, students will be able to:
1	Apply rules of logic to determine the validity of arguments.
2	Recognize use and abuse of percentages and other numbers.
3	Analyze the implications of compound interest in financial calculations.
4	Examine how probabilities influence decision-making.
5	Identify and interpret valid statistical analysis.
6	Compare and contrast linear/exponential growth and decay.
7	Explain the roles of mathematics in art and music.
8	Identify how mathematics is used in politics.
9	Examine a significant mathematical achievement in history.

Course Content

Lecture/Course Content

Topics to be included, but not limited to:

1. Mathematics and Problem-Solving
   a. Propositions and logic
   b. Truth tables
   c. Sets, Venn diagrams, logical equivalence
   d. Arguments and fallacies
   e. Problem-solving strategies
2. Mathematics and Numbers
   a. Unit analysis and conversion
   b. Absolute and relative changes, percentages
   c. Big and small numbers in perspective
   d. Deceptive and misleading numbers
3. Mathematics and finance
   a. Simple and compound interest
   b. Continuous compounding
   c. Savings and investment
   d. Loans and mortgages
   e. Federal budget and deficit
4. Probability and Odds
   a. Counting principles
   b. Permutations and combinations
   c. Compound and conditional probabilities
   d. Law of Large Numbers, expected value
   e. Risk, odds, and probability
5. Data and Statistics
   a. Reliability of a statistical study
   b. Descriptive statistics - graphs, charts, tables
   c. Correlation vs. causality
   d. Measures of central tendency and variation
   e. Normal distribution and the z-score
6. Growth and Decay
   a. Linear modeling
   b. Exponential modeling
   c. Logarithmic scales

7. Mathematics and the Arts
   a. Perspective
   b. Proportion and the Golden Ratio
   c. Music scales, harmony
   d. Fractal geometry
8. Mathematics and Politics
   a. Apportionment
   b. Theory of voting
   c. Big data and politics
9. Selected Topics (Choose one or two from the following topics)
   a. Four-color Theorem
   b. Infinities
   c. Cryptology
   d. Topological equivalence
   e. Knots, links, and their applications
   f. Russell's Paradox (or other paradoxes)
   g. Non-Euclidean geometry
   h. History and significance of pi
   i. Incompleteness Theorem
   j. Game Theory
   k. Matrices
   l. Linear Programming

Laboratory or Activity Content

n/a

Methods of Evaluation

Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):

Written expression
Problem solving exercises
Skills demonstrations

Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):

Computational homework
Essay exams
Group projects
Individual projects
Journals
Mathematical proofs
Oral presentations
Problem-solving exams
Problem-solving homework
Reports/papers
Research papers
Skills demonstrations
Skills tests or practical examinations
Written creation (poem, screenplay, song)

Instructional Methodology

Specify the methods of instruction that may be employed in this course

Audio-visual presentations
Class activities
Class discussions
Collaborative group work
Computer-aided presentations
Demonstrations
Distance Education
Group discussions
Guest speakers
Instructor-guided use of technology

Internet research
Lecture
Modeling
Small group activities
Web-based presentations

Representative Course Assignments

Writing Assignments

1. A research paper on a math topic such as "mathematics in art" may form a component of this course.

Critical Thinking Assignments

1. Students may complete homework problems involving modeling with exponential functions that require critical thinking using mathematical reasoning.

Reading Assignments

1. Textbook reading on topics such as game theory or fractal geometry

Skills Demonstrations

1. Students will need to practice the methods and procedures used in class when completing their problem solving exercises

Outside Assignments

Representative Outside Assignments

1. Homework assigned from the textbook
2. Projects related to a topic covered in class such as simple and compound interest, and may include student presentations
3. Essays on mathematical topics may be assigned

Articulation

Comparable Courses within the VCCCD

MATH M12 - Mathematical Reasoning for Liberal Arts
MATH V40 - Exploration of Mathematical Ideas

Equivalent Courses at other CCCs

College	Course ID	Course Title	Units
College of the Canyons	Math 100	Liberal Arts Mathematics	3

District General Education

A. Natural Sciences

B. Social and Behavioral Sciences

C. Humanities

D. Language and Rationality

D2. Communication/Analytical Thinking

Proposed

E. Health and Physical Education/Kinesiology

F. Ethnic Studies/Gender Studies

CSU GE-Breadth

Area A: English Language Communication and Critical Thinking

Area B: Scientific Inquiry and Quantitative Reasoning

B4 Mathematical/Quantitative Reasoning
Proposed

Area C: Arts and Humanities

Area D: Social Sciences

Area E: Lifelong Learning and Self-Development

Area F: Ethnic Studies

CSU Graduation Requirement in U.S. History, Constitution and American Ideals:

UC TCA

UC TCA
Proposed

IGETC

Area 1: English Communication

Area 2A: Mathematical Concepts & Quantitative Reasoning

Area 2A: Mathematical Concepts & Quantitative Reasoning
Proposed

Area 3: Arts and Humanities

Area 4: Social and Behavioral Sciences

Area 5: Physical and Biological Sciences

Area 6: Languages Other than English (LOTE)

Textbooks and Lab Manuals
Resource Type
Textbook

Classic Textbook
Yes

Description
Bennet and Briggs (2019) *Using & Understanding Mathematics: A Quantitative Reasoning Approach (7th).* Pearson. 9780134705187

Resource Type
Textbook

Classic Textbook

No

Description

Lippman, David (2017). Math in Society: A Survey of Mathematics for the Liberal Arts Major(free OER) (version 2.5)
www.opentextbookstore.com/mathinsociety

Library Resources

Sufficient Library Resources exist

Yes

Distance Education Addendum

Definitions

Distance Education Modalities

Hybrid (1%–50% online)
Hybrid (51%–99% online)
100% online

Faculty Certifications

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.

Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.

Yes

Regular Effective/Substantive Contact

Hybrid (1%–50% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Regular use of asynchronous discussion boards encourages various types of interaction and critical thinking skills among all course participants. Questions and topics posed will allow students to discuss, compare and contrast, identify, and analyze elements of the course outcomes. Other discussion boards may be used for Q&A and general class discussion by students and instructor to facilitate student success and strengthen student learning outcomes.
E-mail	E-mail, class announcements and various learning management system tools such as "Message Students Who" and "Assignment comments" will be used to regularly communicate with all students on matters such as clarification of class content, reminders of upcoming assignments and/or course responsibilities, to provide prompt feedback to students on coursework to facilitate student learning outcomes, or to increase the role of an individual educator in the academic lives of a student. Students will be given multiple ways to email instructor through both the learning management system inbox and faculty provided email accounts.

| Video Conferencing | Video tools such as ConferZoom may be used to provide live synchronous or asynchronous sessions with students. ADA compliance will be upheld with Closed Captioning during the session or of the recorded session. Student-to-student group meetings will also be encouraged. |
| Other DE (e.g., recorded lectures) | Students will watch recorded video lectures. |

Hybrid (51%–99% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Regular use of asynchronous discussion boards encourages various types of interaction and critical thinking skills among all course participants. Questions and topics posed will allow students to discuss, compare and contrast, identify, and analyze elements of the course outcomes. Other discussion boards may be used for Q&A and general class discussion by students and instructor to facilitate student success and strengthen student learning outcomes.
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Other DE (e.g., recorded lectures)	Students will watch recorded video lectures

100% online Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Asynchronous Dialog (e.g., discussion board)	Regular use of asynchronous discussion boards encourages various types of interaction and critical thinking skills among all course participants. Questions and topics posed will allow students to discuss, compare and contrast, identify, and analyze elements of the course outcomes. Other discussion boards may be used for Q&A and general class discussion by students and instructor to facilitate student success and strengthen student learning outcomes.
E-mail	E-mail, class announcements and various learning management system tools such as "Message Students Who" and "Assignment comments" will be used to regularly communicate with all students on matters such as clarification of class content, reminders of upcoming assignments and/or course responsibilities, to provide prompt feedback to students on coursework to facilitate student learning outcomes, or to increase the role of an individual educator in the academic lives of a student. Students will be given multiple ways to email instructor through both the learning management system inbox and faculty provided email accounts.
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Examinations

Hybrid (1%–50% online) Modality
On campus
Online

Hybrid (51%–99% online) Modality
On campus
Online

Primary Minimum Qualification
MATHEMATICS

Review and Approval Dates

Department Chair
05/09/2023

Dean
05/09/2023

Technical Review
05/10/2023

Curriculum Committee
05/10/2023

DTRW-I
MM/DD/YYYY

Curriculum Committee
MM/DD/YYYY

Board
MM/DD/YYYY

CCCCO
MM/DD/YYYY

Control Number
CCC000635209

DOE/accreditation approval date
MM/DD/YYYY