

College of the Canyons
Course Outline of Record Report

09/21/2019

MATH100 : Liberal Arts Mathematics

General Information

Author (s)::

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Course Code (CB01):

MATH100

Course Title (CB02):

Liberal Arts Mathematics

Department:

Mathematics

Proposal Start:

Fall 2019

TOP Code (CB03):

(1701.00) Mathematics, General

SAM Priority Code (CB09):

Non-Occupational

Distance Education Approved:

Yes

Course Control Number (CB00):

CCC0005991

Curriculum Committee Approval Date:

10/18/2018

Board of Trustees Approval Date:

11/07/2018

External Review Approval Date:

Pending

Course Description:

Presents general 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

Submission Rationale:

- New Course

Faculty Requirements

Master Discipline Preferred:

- Mathematics

Alternate Master Discipline Preferred:

No value

Bachelors or Associates Discipline Preferred:

No value

Additional Bachelors or Associates Discipline:

No value

Course Development Options

Course Basic Skill Status (CB08)

Course is not a basic skills course.

Course Special Class Status (CB13)

Course is not a special class.

Grade Options

- Letter Grade methods

Allow Students to Gain Credit by Exam/Challenge

Allowed Number of Retakes

0

Course Prior to College Level (CB21)

Not applicable.

Rationale For Credit By Exam/Challenge

No value

Retake Policy Description

No value

Allow Students To Audit Course

Associated Programs

Course is part of a program (CB24)

Associated Program

Award Type

No value

No value

Transferability & Gen. Ed. Options

Transferability

Transferable to both UC and CSU

Transferability Status

Approved

Associate Degree/Graduation Requirements

Categories

Transferability Status

Comparable Course

- Mathematics Competency

Mathematics Competency

Approved on Aug 19, 2019 12:00:00 AM

Coastline College, Math C100

Antelope Valley College, Math 110

Santa Barbara College, Math 114

Pasadena City College, Math 015

Glendale College, Math 135

Fullerton College, Math 100F

CSU-GE Breadth

Categories

Transferability Status

Comparable Course

- B4

Mathematics/Quantitative Reasoning

Approved on Aug 19, 2019 12:00:00 AM

No Comparable Course defined.

IGETC

Categories

Transferability Status

Comparable Course

- 2

Mathematical Concepts and Quantitative Reasoning

Approved on Aug 19, 2019 12:00:00 AM

No Comparable Course defined.

Units and Hours

Summary

Minimum Credit Units (CB07)

3

Total Course In-Class (Contact) Hours

54

Total Student Learning Hours

162

Maximum Credit Units (CB06)

3

Total Course Out-of-Class Hours

108

Faculty Load

-

Credit / Non-Credit Options

Course Credit Status (CB04)

Credit - Degree Applicable

Course Non-Credit Category (CB22)

Credit Course.

Non-Credit Characteristics

No value

Course Classification Code(CB11)

Credit Course.

Funding Agency Category (CB23)

No value

Cooperative Work Experience Education Status (CB10)

Variable Credit Course

Weekly Student Hours

Course Student Hours

In Class

Out of Class

Lecture Hours

3

6

Lab Hours

-

-

Activity Hours

-

-

Course Duration (Weeks)

18

Hours per unit divisor

54

Course In-Class (Contact) Hours

Lecture

54

Lab

-

Activity

-

Total

54

Course Out-Of-Class Hours

Lecture

108

Lab

-

Activity

-

Total

108

Time Commitment Notes for Students

No value

Faculty Load

Extra Duty: -

Faculty Load: -

Units and Hours - Weekly Specialty Hours

Activity Name

Type

In Class

Out of Class

No value

No value

No value

No value

Requisites

No Value

Entrance Skills

Skill

Content Review

Completion of Intermediate Algebra or higher math placement.

No Value

Limitations on Enrollment

Limitation

Provide Rationale

No value

No value

Specifications

Methods of Instruction

Methods of Instruction Rationale

Lecture Lecture with problem-solving demonstration and discussion

Other Individual and group activities in class to solve practical and critical-thinking problems

Assignments

Reading: textbook, lecture notes, handouts

Problem-Solving:
(Sample Problems)

1. Write the inverse, converse, and contrapositive of a conditional statement.
2. Calculate the future value of \$1000 invested at 5% compounded monthly for 20 years.
3. Find the probability that two people share the same birthday in a group of 30 students.
4. Compare various election methods using the fairness criteria.

(Signature Assignment)

Write an essay on a data-based study in the news and analyze its conclusion from statistical and logical standpoints.

Methods of Evaluation

Methods of Evaluation Rationale

Exams/Tests/Quizzes quizzes, chapter exams, comprehensive final exam

Problem Solving in-class participation in problem-solving

Written Assignments An analysis of a data-based claim in the news

Equipment

No Value

Textbooks

Author

Title

Publisher

Date

ISBN

Jeffrey Bennett, William Briggs

Using & Understanding Mathematics: A Quantitative Reasoning Approach

Pearson

2019, 7th edition

9780134705187

David Lippman

Math in Society: A Survey of Mathematics for the Liberal Arts Major

(free OER) www.opentextbookstore.com/mathinsociety

Version 2.5, released Dec, 2017

Other Instructional Materials

Description

Author

Citation

No Value

No Value

No Value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

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

CSLOs

Apply mathematical strategies to solve real-world problems in society, politics, and the arts. Expected SLO Performance: 70.0

Outline

Outline

1. Mathematics and Problem-Solving (Objective 1)
 - 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 (Objective 2)
 - 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 (Objective 3)
 - a. Simple and compounding interests
 - b. Continuous compounding
 - c. Savings and investment
 - d. Loans and mortgages
 - e. Federal budget and deficit

4. Probability and Odds (Objective 4)
 - 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 (Objective 5)
 - 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 (Objective 6)
 - a. Linear modeling
 - b. Exponential modeling
 - c. Logarithmic scales
- 7. Mathematics and the Arts (Objective 7)
 - a. Perspective
 - b. Proportion and the Golden Ratio
 - c. Music scales, harmony
 - d. Fractal geometry
- 8. Mathematics and Politics (Objective 8)
 - a. Apportionment
 - b. Theory of voting
 - c. Big data and politics
- 9. Selected Topics (Choose one or two from the following topics) (Objective 9)
 - Four-Color Theorem
 - Infinities
 - Cryptology
 - Topological equivalence
 - Knots, links, and their applications
 - Russell’s Paradox (or other paradoxes)
 - Non-Euclidean geometry
 - History and significance of pi
 - Incompleteness Theorem

DLA

A. Delivery Methods: Will this course be offered 100% online only, Hybrid only, or both:

Both

B. How will the methods of instruction used in the face-to-face mode of this course be adapted for the distance learning mode? Describe and give examples of online methods of instruction, which might include course management system discussion boards; instructor developed web lectures; converted Power Point presentations; digital video clips; graphics (digital charts, diagrams, photos, images, annotated screen shots); digital animations; web guests; online reference resources; chat; e-mail; publisher prepared online materials; course cartridge materials; CD/DVD support materials; instructor web site; online library requests; textbook supplements.

All of the same objectives, content, and integrity will be met in sections with distance learning delivery. Students are expected to: 1. Read the textbook and any supplementary reading materials. 2. Participate in mandatory classroom meetings for hybrid formats. 3. Demonstrate writing proficiency by concise written correspondence with the professor and other students and completion of written homework. 4. Complete and electronically submit written assignments. 5. Participate in synchronous or asynchronous group discussion via chat applications or discussion forums, as well as individual communications via email, demonstrating appropriate social and writing skills.

Student learning will be enhanced by the use of online discussion groups which will provide critical thinking forums for student discussion and debate by requiring students to respond to instructor-posted topics as well as to reply to other students' postings.

An example of a discussion forum would be:

1. Find a recent ad (political, medical, commercial) that uses a logical fallacy. Which fallacy type do you see? Is the conclusion false (the use of a fallacy does not necessarily negate the conclusion)? Why or why not?
2. Which mortgage would you choose, given that you need to borrow \$300,000 for the house you want to buy today: a 30-year mortgage at 4.50% or a 15-year mortgage at 4.00%? How much would the monthly payment be under each? What other factors should be considered?

Students will be required to complete homework assignments online and submit them for grading and feedback. Online quizzes may be required to provide students with opportunities to assess their ongoing progress. If possible, self-scoring tutorials and or online quizzes will be utilized to provide feedback more quickly to students. Students may be required to work individually or to collaborate in groups. Email, phone, in person meetings, synchronous chat features, and or CMS group pages may be used to facilitate group interaction. Publisher-prepared PowerPoint slide presentations may be available to supplement and enhance student comprehension of text material. This material may be augmented with instructor-developed PowerPoint slides or web pages. All content will conform to Section 508 requirements. Publisher-provided CD/DVD and or internet resource materials may be available with the textbook which reinforces understanding of concepts covered in the textbook and provides

students with additional opportunities to study more efficiently and learn interactively. These resources may be utilized for instructor-designated assignments and or utilized by students for self-directed study.

C. Title 5 (55376) states that all approved courses offered as distance education shall include regular effective contact between instructor and students, through group and individual meetings, orientation and review sessions, supplemental seminar or study lesions, field trips, library workshops, telephone contact, correspondence, voice mail, e-mail, or other activities.? Describe how you will maintain regular effective contact with the students, including what will make this interaction effective.

The instructor will prepare an orientation letter that provides information about the course so students can evaluate if it is appropriate for them to take the course as an online class. The orientation letter will also include information instructing students where and how they should logon to begin the class and provide a link to the COC distance learning website with the CMS tutorial for students to complete prior to logging on. The orientation letter will be posted online by the time registration begins for the semester the class is offered.

The instructor will respond to student e-mails and other inquiries in a manner that is sufficient for students to maintain adequate progress in the course (e.g., replying to all email inquiries regarding an exam quickly in order to provide students adequate study time.) The instructor will use email to contact all students who fail to complete required assignments, fail to complete them satisfactorily, or fail to attend mandatory face-to face class meetings. The instructor will initiate contact with these students in a timely manner to determine an appropriate course of action. In addition, the instructor will contact students on a regular basis with regard to their progress in class. Students who fail to respond to these emails and are not participating in required class activities may be subject to withdrawal from the course under procedures established by the instructor within the guidelines of campus policy. These procedures will be clearly outlined in the orientation letter and or syllabus.

The instructor will maintain electronic copies of all emails received from and sent to students, as well as any other online correspondence such as announcements posted on the course management system (CMS). The instructor may also maintain records regarding discussion boards, group and individual meetings, orientation and review sessions, supplemental seminars or study sessions, field trips if included, library workshops, telephone contact, non-electronic correspondence, or other activities. This information will be maintained by the instructor in the permanent record of the course, along with the documentation for assessment and the assignment of grades. The holding period for correspondence will be consistent with the College's holding period requirements for grade assignment documentation. The purpose of this requirement is to document the level of regular effective contact between instructor and students throughout the duration of the course. Student monitoring and contact online will be maintained through the use of email, messaging within the CMS, discussion boards, assignment drop box, and other tools which may be available to assist in tracking student participation. The instructor will participate in on-line discussions as necessary to stimulate critical thinking.

For hybrid sections students will be required to attend a specified number of mandatory on-campus class meetings during the semester. These meetings will provide opportunities for person-to-person contact between the instructor and students, review of subject material, activities, and or exams. In the online portion of a hybrid section, instructor-student interaction will be the same as in a fully online section.

D. Describe how you will promote and monitor effective student-to-student contact.

E-mail, messaging, group pages, and or discussion boards will allow for students to contact other students to share ideas and experiences. Students will be required to participate in and respond to discussion board forums or another CMS tool that provides for student-student interaction, such as journals, blogs, or wikis. Students will be required to respond to the posts of other students on discussion board topics. The instructor will monitor discussion board traffic and content. The instructor will use email to contact students who are not participating in required discussion board forums or who are not providing adequate answers. The email will include suggestions on how the student can communicate more effectively on the discussion boards. Students will be encouraged by the instructor to post responses to questions by other students and to provide peer-to-peer assistance. Students may be required to participate in other online activities such as group research and or analytical projects. These projects may be completed and posted online where they may be reviewed by other students for critical analysis and comments.

In hybrid sections students will be required to attend mandatory on-campus meetings. These meetings will provide opportunities for person-to-person contact between students, as described above. In the online portion of a hybrid section, student-student interaction will be the same as in a fully online section.

E. Describe and give examples of how student learning will be evaluated.

The instructor may evaluate students based upon participation and responses in discussion board forums. Evaluation may include quantitative as well as qualitative factors. For example, students may be required to post a minimum of three responses each week to instructor initiated discussion board forums or comments made by other students on discussion boards. They may be required to include in their response whether they agree or disagree with a particular point and to include reasons to support their position.

For hybrid sections students may be evaluated utilizing testing methods similar to those in the same on-ground classes. For 100% online sections students may be evaluated using the CMS test manager. This may include but are not limited to short answer, essay, multiple choice, calculations, or true-false questions. Through the CMS or publisher websites students may have access to self-assessment tools such as self-scoring tutorials, online quizzes, and interactive homework problems which will be used to gauge student progress and to identify weak areas

pertaining to their overall breadth of knowledge and comprehension of specific topics. Research and analytical projects may be assigned individually or in groups and submitted electronically for evaluation and comment by the instructor and or other students.

An example of an assignment appropriate for this course would be:

1. Find a recent news article that alludes to a statistical study. Answer each of the following questions:
 1. What is the population?
 2. What is the sample, and how was the sample chosen?
 3. Is the population well-represented by the sample chosen?
 4. What were the parameters, statistics, and hypotheses?
 5. Do you see any participation bias or selection bias?
 6. Do you believe the conclusion is valid? Why or why not?

1. Look for an article on the Golden Ratio or the Fibonacci Sequence in either art, music, or science. Summarize the main point(s) of the article in a brief essay and submit it online.

F. Describe the college resources that will be required by you and your students in each of the following areas: 1. Facilities (e.g. classroom for orientation sessions, exams, etc.) 2. Technology (e.g. software, hardware, technical support, etc.) 3. Student Support Services (e.g. online library services, counseling, tutoring, DSPS, etc.)

F1. For hybrid sections a classroom will be needed for the on campus class meetings. No facilities will be needed for 100% online sections.

F2. The current CMS used by COC will be used for all distance learning sections. The CMS may also utilize publishers' modules designed to support and compliment a specific textbook. Online technical support, including answering student and faculty inquiries, may be provided by COC distance learning and computer support staff members. Technical support may also be available from publisher-sponsored sources.

F3. Students will be able to access existing on-ground student support services, including the TLC and library. The TLC also provides online tutoring for distance education students. In special circumstances, TLC resources may also be utilized to proctor exams for students who receive permission from the instructor to take an exam outside of scheduled exam times. DSP&S resources may be needed to determine Section 508 compliance of course materials and delivery systems.

G. Technologies used for instruction: Multimedia (streaming video, audio), Flash, Timed Responses, Third-party software, Images (jpeg, gif, etc.) How will you ensure that instruction is accessible to students with disabilities?

Publisher-provided modules may be used in conjunction with the CMS. These modules are primarily based upon content found in the textbook. These modules will be reviewed by DSP&S or such other COC staff member deemed qualified to determine Section 508 compliance. Any noncompliance issues noted will be discussed with the publisher providing the modules to determine an appropriate course of action. This may include changing the module itself or providing the information in an alternate format that is Section 508 compliant. If the noncompliance issue cannot be satisfactorily resolved, then the component of the module giving rise to the noncompliance will be removed from the course content. Students who may have difficulty with online evaluative activities may contact the instructor and request alternative activities. For example, homework may be submitted paper-based rather than online, or chapter quizzes may be proctored in the TLC and taken as paper-based quizzes rather than online. PowerPoint slides and graphic web pages will be converted to formats compatible with text-reading software or will be provided in alternate formats that are Section 508 compliant. Flash-based content used in the course will be provided in alternate formats that are Section 508 compliant.