

Lassen Community College Course Outline

MATH 159 Math Support Lab

0 Units

I. Catalog Description

The purpose of this course is to provide students with the tutorial assistance, study strategies and instructor intervention necessary to support student success in transferable math classes. It is designed as a companion (lab) class supporting the transferable math courses Math 6 (Finite Mathematics), Math 7 (Trigonometry), Math 8 (Advanced Algebra), Math 15 (Pre-Calculus with Trigonometry), Math 1A/B (Analytic Geometry and Calculus I/II), Math 40 (Elementary Statistics), Math 11A/B (Concepts of Elementary School Mathematics I/II) and Math 42 (Math in Modern Society). Students will work on course and topic specific problems, concepts, good study skills and problem-solving strategies. Students will learn how to use technologies as appropriate to their companion course. The study environment and direction may include peer-to peer, instructor-to-student, tutor-to-student, and small groups. Problem solving practice using an individual student's problem sets will be the norm with short lectures/instruction intermixed as appropriate. This is an open entry/open exit course which may be taken as needed with a companion math course. This course has been approved for online and hybrid delivery.

85 Hours Laboratory Maximum
Scheduled: Fall, Spring, Summer

II. Coding Information

Repeatability: Take 3 times
Grading Option: Not Graded
Credit Type: Noncredit - Not Degree Applicable
TOP Code: 170100

III. Course Objectives

A. Course Student Learning Outcomes

Upon completion of this course the student will be able to:

1. Correctly solve problems from the student's companion transferable math course using appropriate concepts, technology, and computational methodologies and skills developed in that companion math class.
2. Develop better study skills, problem solving strategies, and methodologies based on the student's learning style.

B. Course Objectives

Upon completion of this course student will be able to:

- A. Demonstrate an understanding of the concepts and topics in their subject area (Finite mathematics, Trigonometry, Advanced Algebra, Pre-Calculus with Trigonometry, Analytic Geometry and Calculus I & II, Elementary Statistics, Concepts of Elementary School Mathematics I & II, and Math in Modern Society).

- B. Solve homework (and practice problems) and complete assignments in the individual's mathematics subject area (Finite mathematics, Trigonometry, Advanced Algebra, Pre-Calculus with Trigonometry, Analytic Geometry and Calculus I & II, Elementary Statistics, Concepts of Elementary School Mathematics I & II, and Math in Modern Society).
- C. Sharpen academic skills in taking lecture notes, outlining college texts, preparing to take exams, and participating in classroom discussions of academic topics.
- D. Identify study techniques in order to improve their ability to successfully participate in assigned course work.
- E. Develop and implement a realistic weekly study schedule based upon course requirements and personal time limits.

IV. Course Content

- A. Finite Mathematics
 - 1. Linear equations and functions
 - 2. Exponential and logarithmic functions and their applications.
 - 3. Applications of linear functions
 - 4. Solving systems of linear equations
 - 5. Matrices and applications
 - 6. Graphical and Simplex methods of Linear programming.
 - 7. Math of finance
 - 8. Logic and Set theory
 - 9. Probability and combinatorics
- B. Trigonometry (and Pre-Calculus with Trigonometry)
 - 1. Angles and measurements
 - 2. Trigonometric functions, graphs and their inverses
 - 3. Trigonometric identities and equations
 - 4. Solutions of triangles and their applications
 - 5. Vectors
- C. Advanced Algebra (and Pre-Calculus with Trigonometry)
 - 1. Linear and non-linear functions, equations, solutions, graphs and transformations
 - 2. Synthetic division and Remainder and Factor Theorems
 - 3. Solutions of higher-degree equations and inequalities
 - 4. Conic Section equations and graphs
 - 5. Systems of linear equations and matrices
 - 6. Sequences and series
- D. Analytic Geometry and Calculus I/II
 - 1. Limits, continuity and differentiability of functions.
 - 2. Derivatives, higher order derivatives, and their interpretations
 - 3. Differentiation formulas
 - 4. Implicit differentiation and higher order derivatives.
 - 5. Graphing functions using derivatives, concavity and asymptotes.
 - 6. Maximum and minimum values, and optimization.
 - 7. Mean Value Theorem.
 - 8. Integrals, definitions and properties
 - 9. Antiderivatives, definite, indefinite, and improper integrals.
 - 10. Applications of integrals
 - 11. Fundamental Theorem of Calculus and L'Hopital's Rule

12. Introduction to sequences and series and tests for convergence

E. Elementary Statistics

1. Read word problems with comprehension, formulate strategies and choose the correct formulas to solve applied problems
2. Solve and analyze problems for descriptive and inferential statistics, using technology as appropriate
3. Graph statistical information appropriately

F. Concepts of Elementary School Mathematics I/II

1. Numeration systems past and present
2. Number sets: Whole, integer, rational, and real numbers
3. Basic number theory
4. Patterns, pattern recognition, modeling, reasoning, and problem solving
5. Informal Geometry
6. Patterns and functions
7. Measurement (including the metric system)
8. Probability and Statistics
9. Introduction to Computers
10. National and State curriculum standards for elementary math including Common Core State Standards

G. Math in Modern Society

1. Problem-solving
2. Logic
3. Sets
4. Numeration systems
5. Geometry
6. Graph theory
7. Voting and Apportionment
8. Probability and Counting
9. Statistics and Data
10. The mathematics of finance
11. The modern utility of mathematics: management and taxation

V. Assignments

A. Appropriate Readings

Students will be expected to read, or have read, the required textbook for their companion math class. Other brief supplemental readings or handouts appropriate to their topics may be assigned.

B. Writing Assignments

Completing companion math class assignments and supplemental problems to ensure comprehension.

C. Expected Outside Assignments

None.

D. Specific Assignments that Demonstrate Critical Thinking

Multiple measures of student performance including the solution of their companion math class problems, additionally presented like problems, problems presented in different contexts, problems demanding different applications of principles and techniques, and student discussions. Students will formulate strategies, choose correct

formulas in solving applied problems, and use of technology to draw appropriate conclusions.

VI. Methods of Evaluation

Traditional Classroom Evaluation

May include completion of necessary exercises and problems, participation in collaborative activities and one-to-one or small group discussions, completion of a student activity log, and completion of a student evaluation of their study activities at end of semester.

Online Evaluation

Same as face to face with the use of asynchronous and synchronous (chat/forum) discussion forums and email communications as participation in collaborative activities and one-to-one or small group discussions. Students are expected to complete assignments consistent with expectations for face-to-face class. Electronic communication, both synchronous and asynchronous (chat/forum) will be evaluated for participation and to maintain effective communication between instructor and students.

Hybrid Evaluation

Same as face to face with the use of asynchronous and synchronous (chat/forum) discussion forums and email communications as participation in collaborative activities and one-to-one or small group discussions. Students are expected to complete assignments consistent with expectations for face-to-face class. Electronic communication, both synchronous and asynchronous (chat/forum) will be evaluated for participation and to maintain effective communication between instructor and students.

VII. Methods of Delivery

Check those delivery methods for which, this course has been separately approved by the Curriculum/Academic Standards Committee.

Traditional Classroom Delivery

Hybrid Delivery

Online Delivery

Methods of instruction may include, but are not limited to:

Traditional Classroom Course Delivery

Short lecture, laboratory, demonstrations, discussion, and computer assisted instruction using instructor-to-student, peer-to-peer, tutor-to-students, and small groups.

Online Course Delivery

Short lecture, laboratory, demonstrations, discussion, and computer assisted instruction using instructor-to-student, peer-to-peer, tutor-to-students, and small groups via asynchronous and synchronous (chat/forum) discussions, meetings, and email communications equivalent to face-to-face instructional delivery. Student-to-student, tutor-to-student, and teacher-to-student interaction and a minimum of six opportunities for feedback will be utilized to maintain effective communication between instructor and student. Online delivery will use the technology platform adopted by the District.

Hybrid Course Delivery

Short lecture, laboratory, demonstrations, discussion, and computer assisted instruction using instructor-to-student, peer-to-peer, tutor-to-students, and small groups via asynchronous and synchronous (chat/forum) discussions, meetings, and email communications equivalent to face-to-face instructional delivery. Student-to-student, tutor-to-student, and teacher-to-student interaction and a minimum of six opportunities

for feedback will be utilized to maintain effective communication between instructor and student. Online delivery will use the technology platform adopted by the District.

VIII. Representative Texts and Supplies

Students will use the textbook and technology required in their companion math class along with instructor supplied supplements or handouts.

IX. Discipline/s Assignment

Mathematics

X. Course Status

Current Status: Active

Original Approval Date: 03/21/2023

Approved by Board: 05/09/2023:

Revised By: Robert Schofield

Curriculum Committee Revision Date: