



COURSE OUTLINE OF RECORD

Number: MATH A155

TITLE: Finite Mathematics with Applications

ORIGINATOR: Tab Livingston

EFF TERM: Fall 2014

FORMERLY KNOWN AS:

DATE OF

OUTLINE/REVIEW: 03-02-2016

CROSS LISTED COURSE:

TOP NO: 1701.00

CID:

SEMESTER UNITS: 4.0

HRS LEC: 72.0

HRS LAB: 0.0

HRS OTHER: 0.0

CONTACT HRS TOTAL: 72.0

STUDY/NON-CONTACT HRS RECOMMENDED: 144.0

CATALOG DESCRIPTION:

Mathematical models, properties of sets, functions, elementary curve fitting, finance, matrix operations, linear programming by the graphic and simplex methods, Markov matrices, elementary probability, and game theory. May be taken for grades or on a pass-no pass basis. Transfer Credit: CSU; UC.

JUSTIFICATION FOR COURSE:

Comparable to a lower division UC or CSU course

PREREQUISITES:

- MATH A030: Intermediate Algebra with a minimum grade of C or better
or
- Appropriate OCC Math Placement Score.

COREQUISITES:

ADVISORIES:

ASSIGNED DISCIPLINES:

Mathematics

MATERIAL FEE: Yes [] No [X] Amount: \$0.00

CREDIT STATUS: Noncredit [] Credit - Degree Applicable [X] Credit - Not Degree Applicable []

GRADING POLICY: Pass/No Pass [X] Standard Letter [X] Not Graded []

OPEN ENTRY/OPEN EXIT: Yes [] No [X]

TRANSFER STATUS: CSU Transferable[] UC/CSU Transferable[X] Not Transferable[]

BASIC SKILLS STATUS: Yes [] No [X] **LEVELS BELOW TRANSFER:** Not Applicable

CALIFORNIA CLASSIFICATION CODES: Y - Not Applicable

NON CREDIT COURSE CATEGORY: Y - Not applicable, Credit Course

OCCUPATIONAL (SAM) CODE: E

REPEATABLE ACCORDING TO STATE GUIDELINES: No [X] Yes [] **NUMBER REPEATS:**

REQUIRED FOR DEGREE OR CERTIFICATE: No [] Yes [X]

BUSINESS APPLICATION DEVELOPMENT(Associate in Science)

BUSINESS APPLICATION DEVELOPMENT(Certificate of Achievement)

Business Administration(Associate in Science for Transfer)

GE AND TRANSFER REQUIREMENTS MET:

IGETC Area 2: Mathematical Concepts and Quantitative Reasoning

2A: Mathematic

CSU GE Area B: Scientific Inquiry and Quantitative Reasoning

B4 - Mathematics/Quantitative Thinking

OCC AA Gen Ed

AREA A2: LANGUAGE AND RATIONALITY - Communication and Analytical Thinking

OCC AS Gen Ed

AREA A2 – ENGLISH COMMUNICATION - Communication and Analytical Thinking

COURSE LEVEL STUDENT LEARNING OUTCOME(S) Supported by this course:

1. Understand and apply linear models to economics.
2. Set up and solve linear programming problems.
3. Apply mathematical thinking and modeling to solve problems.
4. Summarize, organize and analyze statistical data.
5. Comparison of student achievement with minimum standards on several written tests and a final.

COURSE OBJECTIVES:

1. Describe, use, and construct math models from narrative simple situations.
2. Translate declarative English statements into set notation.
3. Use function notation, apply function concepts.
4. Extend knowledge of polynomial, exponential and log functions and apply to narrative situations.
5. Solve basic linear programming problems using the simplex method.
6. Translate narrative linear programming into matrix form. Maximize and minimize using graphs.
7. Perform matrix operations, use matrices to solve square and non-square systems, use abstract matrix concepts.
8. Solve Markov chains narratives involving steady or specific state.
9. Apply tree diagrams, the fundamental counting theorem, powers, permutations and combinations to counting narratives.
10. Use the fundamental probability rule and probability involving independent, non-independent, mutually exclusive, non-mutually exclusive events.
11. Use expected value on matrix data to make decisions in narrative situations.
12. Solve elementary game theory problems.

COURSE CONTENT:

LECTURE CONTENT:

It is imperative that instructors cover all topics in the outline in order to prepare the students for M140. The instructor may determine the order of topics. The department encourages the instructor to incorporate the graphing calculator wherever it is appropriate.

A. Fundamental concepts

1. review of relevant intermediate algebra
2. review of intermediate algebra terminology
3. use the concepts of basic logic

B. Mathematical Models

1. practice elementary problem solving
2. state and use the properties of sets

C. Functions

1. apply functions as mathematical models
2. use function notation
3. sketch linear and polynomial functions
4. use finance functions to model narrative situations
 - a. compound interest
 - b. continuous compound interest

- c. inflation
- d. annuities and loans
- D. Linear programming
 - 1. interpret linear programming narratives
 - 2. solve linear programming problems in narrative form by the graphical method
 - 3. solve basic linear programming situations using the simplex method
- E. Matrix algebra
 - 1. describe the concept of algorithm
 - 2. perform elementary row operations
 - 3. perform matrix operations
 - 4. perform matrix inversion and use an matrix inverse to solve a square system
 - 5. find solutions to non-square systems in matrix form
- F. Linear models
 - 1. solve general matrix models in narrative form
 - 2. use Markov matrices to find specific or steady states
- G. Probability and counting
 - 1. state the definitions of probability terminology
 - 2. translate statements into set theory
 - 3. count outcomes in narrative situations using
 - a. the fundamental counting rule
 - b. tree diagrams
 - c. permutations
 - d. combinations
 - 4. use the fundamental probability rule in narrative situations
 - 5. analyze and solve narrative situations involving
 - a. independent or mutually exclusive events
 - b. dependent or non-mutually exclusive events
 - c. combination numbers and binomial experiments
 - d. Bayes' rule
- H. Expected value
 - 1. calculate expected values
 - 2. calculate expected values of matrix data
 - 3. apply various decision strategies to a decision matrix
 - 4. reduce or find optimum mixed strategies for a zero-sum game matrix

LABORATORY CONTENT:

METHODS OF INSTRUCTION:

- A. Lecture:
- B. Independent Study:

INSTRUCTIONAL TECHNIQUES:

Lecture, written homework, discussion.

COURSE ASSIGNMENTS:

Reading Assignments

Assigned from textbook. 1 hour

Out-of-class Assignments

Assigned problem solving exercises. 6 hours

Writing Assignments

Tests include writing definitions, describing modeling situations, and criticizing modeling situations. 1 hour

METHODS OF STUDENT EVALUATION:

Midterm Exam
Final Exam
Short Quizzes
Written Assignments
Essay Examinations
Objective Examinations
Problem Solving Exercises
Skills Demonstration

Demonstration of Critical Thinking:

Apply mathematical thinking and modeling to solve problems.

Required Writing, Problem Solving, Skills Demonstration:

Tests include writing definitions, describing modeling situations, and criticizing modeling situations.

TEXTS, READINGS, AND RESOURCES:

TextBooks:

1. Rolf, H. L.. *Finite Mathematics*, 8th ed. Boston: Brooks Cole, 2013

Other:

1. Other appropriate textbooks as chosen by faculty.

LIBRARY:

Adequate library resources include: Print Materials
Non-Print Materials
Online Materials
Services

Comments:

Attachments:

[Attached Files](#)