MATH 0020 - FINITE MATHEMATICS

SECTION A

1. Division: Sciences & Mathematics
2. Subject Code: MATH
3. Course Number: 0020
4. Course Title: FINITE MATHEMATICS
5. Semester of First Offering: FALL 2013

SECTION B General Course Information

1.Units: 3.0 **Variable Units:** N/A
2.This Course is: Degree-Applicable Credit - Transferable
3A. Cross-List: **3B. Formerly:**

Course Format and Duration

4. Standard Term Hours per Week		**5. Standard Term Total Semester Hours**	
Lecture/Discussion:	3	Lecture/Discussion:	54
Lab:		Lab:	
Activity:		Activity:	
By Arrangement:		By Arrangement:	
Total Hours per Week:	3	**Total Hours :**	54

6. Minimum hours per week of independent work done outside the class: 6

Course Preparation - (Supplemental form B required)

7a. Prerequisite(s): (Course and/or other preparation/experience that is REQUIRED to be completed previous to enrollment in this course.)

Completion of MATH D with grade of "C" or better, or placement by matriculation assessment process

7b. Co-requisite(s): (Courses and/or other preparation that is REQUIRED to be taken concurrently with this course.)

7c. Advisory: (MINIMUM preparation RECOMMENDED in order to be succesful in this course. Also known as "Course Advisory".)

Catalog Description And Other Catalog Information:

8. Repeatability: **Not Repeatable**

Please note: Repeatability does not refer to repeating courses because of substandard grades or a lapse of time since the student took the course. A course may be repeated only if the course content differs each time it is offered and the student who repeats it is gaining an expanded educational experience as stipulated in Title V.

- ☐ Skills or proficiencies are enhanced by supervised repetition and practice within class periods.
- ☐ Active participatory experience in individual study or group assignments is the basic means by which learning objectives are attained.
- ☐ Course content differs each time it is offered.

Explanation for above repeatability selection:

9a. Grading Option: Standard Grade

9b. Catalog Description:

Review of functions; systems of equations; mathematics of finance; matrices and their applications; linear programming; introduction to probability and statistics; Markov Chains; and decision making.

Course Outline Information

10. Student Performance Objectives: (Performance objectives for all credit courses must indicate that students will learn critical thinking and will be able to apply concepts at college level.Performance objectives must be related to items listed in Section 11.)

1. Solve problems utilizing graphs of linear functions and linear inequalities.
2. Construct solutions of systems of linear equations using graphical, algebraic or matrix methods.
3. Construct solutions to linear programming problems using graphs or the Simplex Method.
4. Be able to create a frequency distribution and use it to determine mean, median, mode, variance and standard deviation.
5. Solve probability problems using combinatorics.
6. Solve probability problems which involve independent, compound and conditional events.
7. Create a probability function for a random variable and use it to answer probability questions.
8. Solve applied finance problems including compound interest, annuity payments and/or amortization.
9. Solve problems involving a Markov process.

11. Course Content Outline: (Provides a comprehensive, sequential outline of the course content, including all major subject matter and the specific body of knowledge covered.)

I. Linear Functions
a) Slope formula and linear equations
b) Linear Functions
c) Models using linear functions (associated word problems)

II. Systems of Linear Equations
a) Echelon methods for solution
b) Gauss-Jordan method for solution
c) Matrix algebra
d) Matrix inverses method of solution
e) Input-Output models (associated word problems)

III. Linear Programming - Graphical Method
a) Graph linear inequalities
b) Graphical methods for solution to linear programming problems
c) Applications (associated word problems)

IV. Linear Programming - Simplex Method
a) Introduction of slack variable, pivot element
b) Maximization problems
c) Minimization problems, duality
d) Nonstandard problems

V. Mathematics of Finance
a) Interest, simple and compound
b) Annuity evaluation
i) future value
ii) present value, amortization

VI. Sets and Probability
a) Introduction to sets
b) Venn Diagrams
c) Probability
i) basic, intersection, union
ii) conditional, independence
iii) Bayes Theorem
d) Permutations and combinations
e) Binomial probability
f) Probability distributions and expected value

VII. Statistics
a) Mean, median, and mode
b) Variance and standard deviation
c) Applications (associated word problems)

VIII. Markov Chains
a) Basic ideas, introduction
b) Regular Markov Chains

12. Typical Out-of-Class Assignments: (Credit courses **require** two hours of independent work outside of class for each lecture hour, less lab/activity classes. List type of assignments including library assignments.)

a. Reading Assignments: (Submit at least 2 examples.)

1. Read selected topics throughout the course from the textbook, such as how to amortize a home loan based on real world data.

2. Read about the statistical measures of central tendency and be prepared to discuss the similarities and differences between them.

3. Go online and read the expected value of various bets in a common casino game.

b. Writing, Problem Solving or Performance: (Submit at least 2 examples)

1. A farmer grows wheat and barley on her 500 acre farm. Each acre of wheat requires 3 days of labor to plant, tend, and harvest, while each acre of barley requires 2 days of labor. If the farmer and her hired field hands can provide no more than 1200 days of labor this year, how many acres of each crop can she grow?

2. Solve application problems in class. For example: evaluate different IRA models to determine which interest rate and investment style maximizes future retirement benefits.

3. Determine how to split up available labor hours to maximize production and write up your solution.

c. Other (Term projects, research papers, porfolios, etc.)

13. Required Materials:

a. All textbooks, resources and other materials used in this course are college level?

- ☑ Yes
- ☐ No

b. Representative college-level textbooks (for degree applicable courses) or other print materials:

Book 1:

Author:	Stefan Waner
Title:	Finite Mathematics
Publisher:	Cengage Learning
Date of Publication:	2010
Edition:	5th

c. Other materials and/or supplies required of students:

14.Check all Instructional methods used to present course content:

- ☑ Lecture
- ☐ Discussion Semminar
- ☐ Lab
- ☑ Directed Study
- ☑ Activity
- ☐ Distance Education (requires supplemental form)
- ☐ Work Experience
- ☐ Tutoring

Other: Small Groups

Give detailed examples of teaching methodology that relate to the course performance objectives:
1. In-Class Collaborative Learning Activity - The instructor will pose a question and ask student input for data. The instructor will model computation of results and then students will work independently or in small groups to choose appropriate interest functions to analyze payments size for different loan amounts, interest rates, and payoff periods.

2. Students will complete a classroom survey on numbers relating to their lives (such as number of units taken, number of siblings, age) and the instructor will lead a class discussion to compute the mean, median, mode, variance, and standard deviation and interpret the results.

15. Methods of Assessing Student Learning
15a. Methods of Evaluation:

- ☐ Essay Exam
- ☑ Objective Exam
- ☑ Projects
- ☑ Class Discussion
- ☑ Reports
- ☑ Problem Solving Exam
- ☐ Skill Demonstration
- ☑ Other

15b. (All courses must provide for measurement of student performance in terms of stated student performance objectives, Area 10, and culminate in a formal recorded grade based on uniform standards. Submit at least 2 examples.)

1. Solve a real world linear programming problem using the simplex method. Students are evaluated on creation of the correct linear inequalities, introduction of slack variables, appropriate selection of pivot element, matrix manipulation, and attaining final solution.

2. Solve a problem involving voter turnout. Given county registration percentages, and number of people who voted in a particular election, calculate the probability that a particular voter was a given political party. Solutions are evaluated by correct usage of percentages, tree diagrams, theorems used, and final probability.

SECTION C

1. Program Information:

- ☑ In an approved program
- ☐ Part of a new program
- ☐ Not part of an approved program

2. TOP Code Information

Program Title: Mathematics, General 170100

3. Course SAM Code:

- ☐ A - Apprenticeship Course
- ☐ B - Advanced Occupational
- ☐ C - Clearly Occupational
- ☐ D - Possibly Occupational
- ☑ E - Non-Occupational

4. Faculty Minimum Qualifications/Degrees:

Mathematics

Comments:

SECTION D

General Education Information:

1. College Associate Degree GE Applicability:

Communication & Analytic Thinking

Math Competency

2. CSU GE Applicability:

B-4 Mathematics/Quantitative Reasoning

3. IGETC Applicability:

2: Mathematical Concepts & Quantitative Reasoning

4. CAN :

5. LDTP:

SECTION E

1. Articulation Information: (Required for Transferable Courses Only)

- ☑ CSU Transferable
- ☑ UC Transferable
- ☐ CSU/UC Major Requirement.

If CSU/UC major requirement, list campus and major. (Note: Must be lower division)

2. List at least one community college and its comparable course. If requesting CSU and/or UC transferability also list a CSU/UC campus and comparable lower division course

American River College: Math 344 Finite Mathematics
Contra Costa College: Math 170 Finite Mathematics
CSU Long Beach: Math 114 Finite Mathematics
Sonoma State University: Math 131 Intro to Finite Mathematics
UCLA: Math 2 Finite Mathematics

SECTION F

Planning and Resources: Please address the areas below:

1. Evidence of Need or Potential: recommendations of advisory committee, connection to existing or planned degrees/certificates, or regional/national developments, transfer university requirements.

AA GE degree requirements for Math Competency
CSU GE Applicability for Mathematics/Quantitative Reasoning
IGETC Applicability for Mathematical Concepts & Quantitative Reasoning

2. Appropriateness to Mission: connection to basic skills, transfer, career technical education, or lifelong learning; relationship

Transfer-Level math class.

3. Place in Program/Department: relationship to student learning outcomes identified by program, connection to general education, or articulation with other institutions.

Meets all four student learning outcomes for the math program.

4. Availability of Faculty and Facilities: minimum qualifications to teach course, special training for instructors, or long-term physical impact of course.

No special qualifications or training needed to teach the course.

5. Potential Impact on Resources: impact on library, computer support, transportation, equipment, or other needs

No additional impact.

SECTION G

1. Maximum Class Size (recommended): 35

2. If recommended class size is not standard, then provide rationale: