MATH135 : Mathematical Ideas in the Modern World

General Information

Author:	• Suzanne Palermo
Course Code (CB01) :	MATH135
Course Title (CB02) :	Mathematical Ideas in the Modern World
Department:	MATH
Proposal Start:	Fall 2024
TOP Code (CB03) :	(1701.00) Mathematics, General
CIP Code:	(27.0101) Mathematics, General.
SAM Code (CB09) :	Non-Occupational
Distance Education Approved:	Yes
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000134276
Curriculum Committee Approval Date:	04/10/2024
Board of Trustees Approval Date:	06/20/2023
Last Cyclical Review Date:	04/01/2020
Course Description and Course Note:	MATH 135 is a one-semester course designed for SLAM majors that do not require MATH 136 or MATH 138. Topics in this course include units and unit conversion, proportional reasoning, probability, descriptive statistics, basic probability, financial mathematics, apportionment, and voting theory. Emphasis is placed on the application of these concepts to real world data, development of quantitative reasoning, and the interpretation of results. A spreadsheet software will be used as an exploration tool.
Justification:	Content Change
Academic Career:	• Credit
Author:	• Suzanne Palermo

Academic Senate Discipline

Primary Discipline:	• Mathematics
Alternate Discipline:	No value
Alternate Discipline:	No value

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

☐ Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Pre-Collegiate Level (CB21)

Not applicable.

Grading Basis

• Grade Only

Course Support Course Status (CB26)

Course is not a support course

Transferability & Gen. Ed. Options

General Education Status (CB25)

GE Status (CSU) B4, (UC) 2

Transferability

Transferable to both UC and CSU

Transferability Status

Approved

IGETC Area	Area	Status	Approval Date	Comparable Course
2-Math	Mathematical Concepts and Quantitative Reasoning	Approved	02/21/2007	No Comparable Course defined.

CSU GE-Breadth Area	Area	Status	Approval Date	Comparable Course
B4-Mathematics/Quantitative Reasoning	Mathematics/Quantitative Reasoning	Approved	09/12/1988	No Comparable Course defined.

Units and Hours

Summary

Minimum Credit Units (CB07)	3
Maximum Credit Units (CB06)	3
Total Course In-Class (Contact) Hours	90
Total Course Out-of-Class Hours	72
Total Student Learning Hours	162

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

☐ Variable Credit Course

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	2	4
Laboratory Hours	3	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	0
Course In-Class (Contact) Hours	
Lecture	36
Laboratory	54

Studio	0
Total	90

Course Out-of-Class Hours

Lecture	72
Laboratory	0
Studio	0
Total	72

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Prerequisite

MATH90 - Intermediate Algebra for BSTEM

<u>Objectives</u>
- solve linear equations and compound inequalities;
- solve applied problems;
- graph functions (linear, quadratic, exponential, logarithmic);

OR

Prerequisite

Placement is based on academic background or completion of MATH 90.

Entry Standards

Entry Standards

Course Limitations

Cross Listed or Equivalent Course

Specifications

Methods of Instruction

Methods of Instruction	Lecture

Methods of Instruction	Laboratory

Methods of Instruction	Discussion

Methods of Instruction	Multimedia

Methods of Instruction	Collaborative Learning

Methods of Instruction	Demonstrations

Methods of Instruction	Guest Speakers

Out of Class Assignments

- Homework assignments (e.g. problem sets)
- Research-based project (e.g. comparing two or more investments)

Methods of Evaluation	Rationale
Other	Research assignments
Exam/Quiz/Test	Quizzes
Exam/Quiz/Test	Three to five examination are required
Exam/Quiz/Test	A comprehensive final examination is required

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN

No Value	No Value	No Value	No Value	No Value

Other Instructional Materials (i.e. OER, handouts)

Description	Math in Society
Author	Lippman, David
Citation	http://www.opentextbookstore.com/mathinsociety/2.5/MathinSociety.pdf
Online Resource(s)	

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

Use the basic concepts of sets to solve problems

Describe data using graphs and descriptive statistics

Compute probabilities

Arrange and present data using different types of statistical charts and graphs

Draw inferences from data

Use modeling to draw conclusions and check whether results are reasonable

Apply the proper counting technique to solve problems

Apportion using the Hamilton, Jefferson, Webster-Wilcox, and Hill-Huntington techniques and identify undesirable consequences of each technique

Solve finance problems involving annuities and loans

Evaluate various real world investing and borrowing options and their financial implications

Compare two or more investments using present value analysis

Expository writing on the study of financial mathematics

Differentiate between a variety of election systems, determine the winners in each, and identify undesirable features of each

SLOs

Use, analyze, and describe data sets, probability models, apportionment techniques, and voting systems.   Expected Outcome Performance: 70.0

ILOs Core ILOs	Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.
	Use quantitative and/or analytical mathematical skills to solve problems and to interpret, evaluate, and process information and data to draw logical conclusions and support claims.
ILOs General Education	apply techniques of analysis and critical thinking to critique real world and theoretical topics and issues

Identify and analyze the implications and consequences of various financial decisions concerning borrowing and investing money

Expected Outcome Performance: 70.0

ILOs Core ILOs	Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.
	Use quantitative and/or analytical mathematical skills to solve problems and to interpret, evaluate, and process information and data to draw logical conclusions and support claims.
ILOs General Education	apply techniques of analysis and critical thinking to critique real world and theoretical topics and issues

Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?

No Value

Is this proposal submitted in response to learning outcomes assessment data?

No Value

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content

Math and Numbers (6)
- Percentages and Proportions
- Conversions
- Estimating the Answer

- Scientific Notation
- Misleading Interpretations
- Solving linear equations and inequalities

Set Theory (6)
- Union, Intersection, Complement
- Venn Diagrams
- Fundamental Principle of Counting
- Permutations and Combinations

Probability (6)
- Mutually Exclusive events
- Expected Value
- Conditional Probability
- Two-way tables and tree diagrams
- Independence

Data and Statistics (6)
- Graphical representation of data
- Measures of central tendency
- Measures of dispersion
- Normal Distribution

Math and Finance (6)
- Simple and compound interest
- Annuities
- Amortized loans (e.g., mortgages and student loans)

Math and Politics (6)
- Apportionment
- Apportionment of Legislative Districts
- Voting Theory
- Weighted Voting

Total Hours=36

Laboratory/Studio Content

Math and Numbers (7)
- Percentages and Proportions
- Conversions
- Estimating the Answer
- Scientific Notation
- Misleading Interpretations
- Solving linear equations and inequalities

Set Theory (7)
- Union, Intersection, Complement
- Venn Diagrams
- Fundamental Principle of Counting
- Permutations and Combinations

Probability (9)
- Mutually Exclusive events
- Expected Value
- Conditional Probability
- Two-way tables and tree diagrams
- Independence

Data and Statistics (7)
- Graphical representation of data
- Measures of central tendency
- Measures of dispersion
- Normal Distribution

Math and Finance (7)
- Simple and compound interest
- Annuities
- Amortized loans (e.g., mortgages and student loans)

Math and Politics (9)
- Apportionment
- Apportionment of Legislative Districts
- Voting Theory

- Weighted Voting

Math Study Skills Content (8)
- Mindset and motivation for college success in mathematics
- Test taking techniques
- Time management and goal setting
- Critical thinking skills
- College support resources
- Math community resources

Total Hours=54

Additional Information

Is this course proposed for GCC Major or General Education Graduation requirement? If yes, indicate which requirement in the two areas provided below.

Yes

GCC Major Requirements

Mathematics

GCC General Education Graduation Requirements

Communication and Analytical Thinking

Repeatability

Not Repeatable

Justification (if repeatable was chosen above)

No Value

Resources

Did you contact your departmental library liaison?

No

If yes, who is your departmental library liason?

No Value

Did you contact the DEIA liaison?

No

Were there any DEIA changes made to this outline?

No

If yes, in what areas were these changes made:

No Value

Will any additional resources be needed for this course? (Click all that apply)

- No

If additional resources are needed, add a brief description and cost in the box provided.

No Value