MATH111 : College Algebra for Liberal Arts

General Information

Author:	• Suzanne Palermo
Course Code (CB01) :	MATH111
Course Title (CB02) :	College Algebra for Liberal Arts
Department:	MATH
Proposal Start:	Spring 2025
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) :	CCC000645360
Curriculum Committee Approval Date:	06/12/2024
Board of Trustees Approval Date:	Pending
Last Cyclical Review Date:	11/01/2021
Course Description and Course Note:	MATH 111 is a college (transfer) level course in algebra designed for Liberal Arts majors. Students explore mathematical topics pertinent to finance and the liberal arts. These topics include functions and their inverses, transformations of functions, solving equations and inequalities, logarithmic and exponential equations, applications in finance, complex numbers, systems of equations, and graphs of linear, quadratic, polynomial, exponential, and logarithmic functions.
Justification:	Content Change
Academic Career:	Credit
Mode of Delivery:	No value
Author:	No value
Course Family:	No value

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 with Pass / No-Pass Option

Course Support Course Status (CB26)

Course is not a support course

General Education and C-ID

General Education Status (CB25)

GE Status (CSU) B4, (UC) 2

Transferability

Transferable to both UC and CSU

Transferability Status

Approved

CSU GE-Breadth Area	Area	Status	Approval Date	Comparable Course
B4-Mathematics/Quantitative Reasoning	Mathematics/Quantitative Reasoning	Approved	08/29/2022	No Comparable Course defined.

IGETC Area	Area	Status	Approval Date	Comparable Course
2-Math	Mathematical Concepts and Quantitative Reasoning	Approved	09/03/2024	No Comparable Course defined.

Units and Hours

Summary

Minimum Credit Units (CB07)	3.5
Maximum Credit Units (CB06)	3.5
Total Course In-Class (Contact) Hours	90
Total Course Out-of-Class Hours	108
Total Student Learning Hours	198

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.

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

Variable Credit Course

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	3	6
Laboratory Hours	2	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54

Course In-Class (Contact) Hours

Lecture	54
Laboratory	36
Studio	0
Total	90

Course Out-of-Class Hours

Lecture	108
Laboratory	0
Studio	0
Total	108

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

Objectives

- Solve absolute value equations and inequalities.
- Solve linear equations and compound inequalities.
- Perform operations with polynomials.
- Simplify complex fractions.
- Perform operations with radical expressions.
- Simplify expressions with rational exponents.
- Solve rational equations.
- Solve equations with radicals.
- Find the equation of a line parallel or perpendicular to a given line.
- Solve a system of linear equations using elimination substitution.
- Solve systems of linear inequalities.
- Find the composition of two functions.
- Solve applied problems.
- Solve quadratic equations with real and complex solutions.
- Find the inverse of a function.
- Use the properties of logarithms to simplify and expand expressions.
- Solve logarithmic and exponential equations.
- Graph parabolas and circles centered at any point.
- Graph functions (linear, quadratic, exponential, logarithmic).

Prerequisite

MATH90+ - Intermediate Algebra for BSTEM with Support

<u>Objectives</u>
- Solve absolute value equations and inequalities.
- Solve linear equations and compound inequalities.
- Perform operations with polynomials.
- Simplify complex fractions.
- Perform operations with radical expressions.
- Simplify expressions with rational exponents.
- Solve rational equations.
- Solve equations with radicals.
- Find the equation of a line parallel or perpendicular to a given line.
- Solve a system of linear equations using elimination, substitution.
- Solve systems of linear inequalities.
- Find the composition of two functions.
- Solve applied problems.
- Solve quadratic equations with real and complex solutions.
- Find the inverse of a function.
- Use the properties of logarithms to simplify and expand expressions.
- Solve logarithmic and exponential equations.
- Graph functions (linear, quadratic, exponential, logarithmic).
- Graph parabolas and circles centered at any point.

OR

Prerequisite

Placement is based on academic background or satisfactory 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

Methods of Instruction	Presentations

Out of Class Assignments

- Homework (e.g. problem sets related to course content)
- Writing assignments (e.g. computer assignments, projects, or papers)

Methods of Evaluation	Rationale
Exam/Quiz/Test	Quizzes
Exam/Quiz/Test	Three or more examinations are required
Exam/Quiz/Test	A comprehensive final exam is required

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Abramson, Jay	College Algebra	Openstax	2021	978-1-951693-41-1

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

No Value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

Analyze and investigate properties of functions.

Synthesize results from the graphs and/or equations of functions.

Solve and apply equations including rational, linear, absolute value, polynomial, exponential, and logarithmic equations.

Solve linear and nonlinear systems of equations and inequalities.

Apply functions and other algebraic techniques to model real world applications.

Recognize the relationship between functions and their inverses graphically and algebraically.

Apply transformations to the graphs of functions.

SLOs

Identify, manipulate, graph, transform, and solve various formulas, functions, inverses, equations, and inequalities relevant to liberal arts.

Expected Outcome Performance: 70.0

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.
Core ILOs	
	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.

Critically analyze mathematical formulas, models, and graphs related to liberal arts as well as explain these solutions clearly and effectively.

Expected Outcome Performance: 70.0

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.
Core ILOs	
	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.

Additional SLO Information

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

No

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

No

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

Equations and Inequalities (10 hours)
- Rational equations
- Linear equations and absolute value
- Polynomial
- Radical
- Complex numbers
- Exponential and logarithmic
- Linear and non-linear inequalities
- Systems of equations
- Linear programming (optional)

Functions (8 hours)
- Definition
- Evaluation
- Algebra of functions
- Domain and range
- One-to-one functions and inverses

Functions and Their Graphs (12 hours)
- Cartesian Coordinate System
- Linear and absolute value functions
- Polynomial functions
- Rational functions
- Asymptotic behavior, Intercepts, and Vertices
- Radical functions

Exponential and Logarithmic Functions and Their Graphs (14 hours)

- Exponential functions
- Logarithmic functions
- Properties of logarithms
- Exponential and logarithmic equations
- Common and natural logarithms
- Applications to finance, growth, and decay

Transformations of Functions (10 hours)
- Quadratic
- Absolute Value
- Radical
- Rational
- Logarithmic
- Exponential

Total Hours: 54

Laboratory/Studio Content

Math Study Skills Laboratory Content (8 hours)
- 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

Algebra Laboratory Content (28 hours)
- Real numbers
- Exponents and radicals
- Algebraic expressions
- Rational expressions
- Linear equations and inequalities
- Absolute values
- Polynomial
- Radical
- Complex numbers
- Definition of functions
- Domain and range
- Cartesian Coordinate System
- Quadratic, absolute value and radical functions

Total Hours: 36

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