COURSE SYLLABUS

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SECTION 1: COURSE INFORMATION

Format: 8 weeks.

Course ID: MATH 1213

Course Title: College Algebra

College: Department of Foundational Core

Prerequisites: Recommended SAT score 490 / ACT score 21 or greater.

Credit Hours: 3

Instructor: See the online course in MyFIRE for instructor contact information and availability.

Course Description

This course is a study of the systematic development of fundamental algebraic operations. Included in this development are systems of linear equations and inequalities; linear, quadratic, exponential and logarithmic functions; absolute value equations; radicals; and conic sections.

Course Overview

Mathematics, Galileo suggests, is the language by which the book of the universe is read. In the Department of Mathematics students will explore and interpret the —alphabet in which God wrote the universe. We seek to help students develop an analytical attitude and become more conscious of the value of precise thinking. Students will gain appreciation of how mathematics enriches the intellectual life and how it provides models for handling applications to various fields.

Course Workload

Time spent on course assignments will vary by student depending on familiarity with course content, reading rate of speed, writing rate of speed, and other individual factors. Based on averages for most students, it is estimated that the course workload estimate for this course is **64.24 (8.03 hours per week)**.

Course Materials

This course is utilizing Follett Access®, a new and convenient program designed to ensure every student has the course materials they need to succeed. When you register for this course, the required course materials will be ordered for you, and the cost of the materials will be applied to your student account as a course fee. This feature enables you to identify the full cost of your course upfront with no surprises of additional out of pocket expenses for required course materials. Required and optional textbooks are accessed and ordered through SEU's bookstore.

Disclaimer: The resources utilized in this course provide information, thoughts and insights that should encourage critical thinking on the part of the student. Please note as well that as an Assembly of God institution, Southeastern University does not necessarily endorse specific personal, religious, philosophical, or political positions found in these resources.

Course Topics

The purpose of this course is to introduce, reinforce, and measure learning on the following topics:

- Equations and Inequalities
- Graphs and Functions
- Polynomial and Rational Functions
- Exponential and Logarithmic Functions

Intended Learning Outcomes

As a result of reading, study, and assessments in this course, the student should be able to:

- Demonstrate an understanding of and employ function notation.
- Interpret information displayed graphically such as domain, range, intercepts, function values, increasing/decreasing intervals, and maximums/minimums.
- Analyze the graphs of linear, absolute value, quadratic, rational, cubic, radical, exponential, and logarithmic functions.
- Apply transformations to the graphs of common functions.
- Combine functions using algebra of functions, specifying domains.
- Write functions as compositions.
- Verify and find the inverse of a one-to-one function.
- Describe the end behavior, determine zeros of, and graph polynomial functions.
- Utilize the Rational Zero Theorem, Remainder Theorem, Factor Theorem, and synthetic division to solve a polynomial equation.
- Calculate the domain and asymptotes of rational functions.
- Convert an exponential equation to logarithmic form, and a logarithmic equation to exponential form.
- Use the properties of logarithms to expand a logarithmic expression, and to write an expanded logarithmic expression as a single logarithm.

- Use properties of logarithms to solve exponential equations and logarithmic equations.

Late Work

Work ahead: For planned events (mission trips, vacations, surgeries) you are invited to work ahead in order to submit work by the due date. No permission is needed.

Request an extension: If you know you will not be able to turn work in on time, contact your professor at least 24 hours before the assignment is due. Let the professor know about your circumstances and when you can turn the work in. If the professor decides to grant you an extension and you get the work in when you say you will, there will not be a penalty. You should only request an extension when something unforeseen comes up that you have no control over; a professor has no obligation to grant an extension and will be less inclined to do so if you are asking for one every week.

Late work: without prior arrangements, late work* submitted within one week of the original due date will be considered for partial credit. Work will ONLY be accepted for the first seven days after it is due. NO WORK will be accepted past the last day of the course.

*Discussion Posts: late participation in discussion forums is not accepted for late credit. The purpose of the discussion forum is to engage with your classmates on substantive ideas related to the course material, and your classmates will not revisit forums past the due dates. Similarly, professors will not revisit forums to grade past discussion due dates.

Professors of Foundational Core courses have been instructed to follow this policy to ensure fairness across all FC classes. Your professor will work with you if true emergencies occur, but your busy schedule will not be considered an emergency. If you have travel, a vacation, a wedding, or any other plannable event, it is up to you to communicate with your instructor to avoid grade penalties.

Extra Credit

None accepted

SECTION 2: SOUTHEASTERN POLICIES

Academic Policies

View this link to see Southeastern's Policies regarding SEU's Mission and Vision Statements, Title IX Statement, Student Services, Class Participation, Official Email, MyFIRE Use, Technical Difficulties, Technical Support, Disability Statement, Academic Honesty, Course Evaluation, Official Withdrawal, Grading Scale, and Netiquette.

SECTION 3: COURSE SCHEDULE

The **Course Schedule** provides a listing of your work in this course. The assessments are listed by Module and include the due dates and point values.

Note: Assignments are due by 11:59 p.m. EST on the due date, unless otherwise noted.

AIM, LEARN, AND APPLY DESCRIPTIONS

Aim

When you see the Aim icon, you will be introduced to topics and ideas that will be covered throughout this module. The AIM will also provide you with a glimpse into your learning objectives and an introduction to this module.

Learn

When you see the Learn icon, all of your reading assignments will be listed and may include additional resources that your instructor is providing to help you complete the activities and assessments for the module.

Apply

When you see the Apply Icon, it will be time to demonstrate your learning for the module. The items here are those in which you'll be graded and may include discussions, activities, assignments, quizzes, exams, and projects.

MODULE 1:

XX/XX/XX - XX/XX/XX

> Review basic operations with radicals, including simplifying, adding, subtracting, and multiplying with radicals, as well as rationalizing the denominator.

> Review factoring out a greatest common factor, factoring by grouping, factoring trinomials, and factoring the difference of squares.

> Review simplifying algebraic expressions.

> Review simplifying exponential expressions

> Read: Are You Ready for College Algebra?

> Section P.3: Radicals Review

> Section P.5: Factoring Review

> MyLabsPlus resources (View an Example, Help Me Solve It, Ask My Instructor, etc.)

> Pretest

  o Due: Tuesday

  o Points: Ungraded

> MyLabsPlus Homework Assignments

  o Are You Ready for College Algebra?

  o Section P.3: Radicals Review

  o Section P.5: Factoring Review

  o Due: Tuesday

- Points: 62

MODULE 2:

XX/XX/XX - XX/XX/XX

- ➢ Solve equations involving linear, quadratic, and rational exponent expressions.

- ➢ Simplify expressions involving complex numbers and radicals.

- ➢ Interpret information displayed graphically.

- ➢ Section 1.1: Graphs & Graphing Utilities

- ➢ Section 1.2: Linear & Rational Equations

- ➢ Section 1.4: Complex Numbers

- ➢ Section 1.5: Quadratic Equations

- ➢ Section 1.6: Other Types of Equations

- ➢ MyLabsPlus resources (View an Example, Help Me Solve It, Ask My Instructor, etc.)

- ➢ MyLabsPlus Homework Assignments
  - o Section 1.1: Graphs & Graphing Utilities
  - o Section 1.2: Linear & Rational Equations
  - o Section 1.4: Complex Numbers
  - o Section 1.5: Quadratic Equations
  - o Section 1.6: Other Types of Equations
  - o Due: Tuesday
  - o Points: 58
- ➢ Week 2 Test (Chapter 1)
  - o Due: Tuesday
  - o Points: 22

MODULE 3:

XX/XX/XX - XX/XX/XX

➢ Demonstrate an understanding of functions and employ function notation.

➢ Interpret information displayed graphically, such as domain, range, intercepts, function values, increasing or decreasing intervals, and maximums or minimums.

➢ Analyze the graphs of linear functions.

➢ Section 2.1: Basic Functions & Graphs

➢ Section 2.2: More on Functions

➢ Section 2.3: Linear Functions & Slope

➢ Section 2.4: More on Slope

➢ MyLabsPlus resources (View an Example, Help Me Solve It, Ask My Instructor, etc.)

➢ Interval and Set Notation - This video will review with you how to use interval notation to express an interval as a pair of numbers. This notation is used throughout the course when expressing answers for domain and range, as well as expressing where a graph is increasing, decreasing, or constant.

➢ MyLabsPlus Homework Assignments

  o Section 2.1: Basic Functions & Graphs

  o Section 2.2: More on Functions

  o Section 2.3: Linear Functions & Slope

  o Section 2.4: More on Slope

- o Due: Tuesday

- o Points: 43

- ➢ Discussion Forum 1

  - o Due: Saturday, Tuesday

  - o Points: 100

- ➢ Week 3 Test (2.1–2.4)

  - o Due: Tuesday

  - o Points: 18

MODULE 4:

XX/XX/XX - XX/XX/XX

➢ Analyze the graphs of linear, absolute value, quadratic, cubic, and radical functions.

➢ Apply transformations to the graphs of common functions.

➢ Combine functions using algebra of functions, specifying domains.

➢ Write functions as compositions.

➢ Verify and find the inverse of a one-to-one function.

➢ Section 2.5: Transformations of Functions

➢ Section 2.6: Combinations of Functions; Composite

➢ Section 2.7: Inverse Functions

➢ MyLabsPlus resources (View an Example, Help Me Solve It, Ask My Instructor, etc.)

➢ This video offers extra examples of a technique to use to find the domain and range of a graph: Finding Domain and Range of a Function using a Graph

➢ The following two videos offer extra examples of how to express increasing, decreasing, and constant intervals of a graph:

   o Increasing, Decreasing, Constant

   o Intervals Where a Function is Increasing, Decreasing, or Constant

➢ MyLabsPlus Homework Assignments

   o Section 2.5: Transformations of Functions

- o Section 2.6: Combinations of Functions; Composite
- o Section 2.7: Inverse Functions
- o Due: Tuesday
- o Points: 47
- ➢ Week 4 Test (2.5–2.7)
    - o Due: Tuesday
    - o Points: 18

MODULE 5:

XX/XX/XX - XX/XX/XX

- Describe the end behavior, determine zeros of, and graph polynomial functions.
- Utilize the rational zero theorem, remainder theorem, factor theorem, and synthetic division to solve a polynomial equation.

- Section 3.1: Quadratic Functions
- Section 3.2: Polynomial Functions
- Section 3.3: Dividing Polynomials; Remainder & Factor Theorems
- MyLabsPlus resources (View an Example, Help Me Solve It, Ask My Instructor, etc.)

- MyLabsPlus Homework Assignments
  - Section 3.1: Quadratic Functions
  - Section 3.2: Polynomial Functions
  - Section 3.3: Dividing Polynomials; Remainder & Factor Theorems
  - Due: Tuesday
  - Points: 44
- Week 5 Test (3.1–3.3)
  - Due: Tuesday
  - Points: 20

MODULE 6:

XX/XX/XX - XX/XX/XX

➢ Utilize the rational zero theorem, remainder theorem, factor theorem, and synthetic division to solve a polynomial equation.

➢ Calculate the domain and asymptotes of rational functions.

➢ Section 3.4: Zeros of Polynomial Functions

➢ Section 3.5: Rational Functions

➢ Learning Resources:

➢ MyLabsPlus resources (View an Example, Help Me Solve It, Ask My Instructor, etc.)

➢ MyLabsPlus Homework Assignments

    o Section 3.4: Zeros of Polynomial Functions

    o Section 3.5: Rational Functions

    o Due:Tuesday

    o Points: 27

➢ Week 6 Test (3.4–3.5)

    o Due: Tuesday

    o Points: 12

MODULE 7:

XX/XX/XX - XX/XX/XX

- ➢ Convert an exponential equation to logarithmic form, and a logarithmic equation to exponential form.

- ➢ Use the properties of logarithms to expand a logarithmic expression, and to write an expanded logarithmic expression as a single logarithm.

- ➢ Use properties of logarithms to solve exponential equations and logarithmic equations.

- ➢ Section 4.1: Exponential Functions

- ➢ Section 4.2: Logarithmic Functions

- ➢ Section 4.3: Properties of Logarithms

- ➢ Section 4.4: Exponential & Logarithmic Equations

- ➢ MyLabsPlus resources (View an Example, Help Me Solve It, Ask My Instructor, etc.)

- ➢ MyLabsPlus Homework Assignments
  - o Section 4.1: Exponential Functions
  - o Section 4.2: Logarithmic Functions
  - o Section 4.3: Properties of Logarithms
  - o Section 4.4: Exponential & Logarithmic Equations
  - o Due: Tuesday
  - o Points: 68
- ➢ Discussion Forum 2

- o Due: Saturday, Tuesday
- o Points: 100
- ➢ Week 7 Test (Ch. 4)
  - o Due: Tuesday
  - o Points: 20

MODULE 8:

XX/XX/XX - XX/XX/XX

- ➢ Demonstrate an understanding of functions and employ function notation.

- ➢ Interpret information displayed graphically, such as domain, range, intercepts, function values, increasing or decreasing intervals, and maximums or minimums.

- ➢ Analyze the graphs of linear, absolute value, quadratic, rational, cubic, radical, exponential, and logarithmic functions.

- ➢ Apply transformations to the graphs of common functions.

- ➢ Combine functions using algebra of functions, specifying domains.

- ➢ Write functions as compositions.

- ➢ Verify and find the inverse of a one-to-one function.

- ➢ Describe the end behavior, determine zeros of, and graph polynomial functions.

- ➢ Utilize the rational zero theorem, remainder theorem, factor theorem, and synthetic division to solve a polynomial equation.

- ➢ Calculate the domain and asymptotes of rational functions.

- ➢ Convert an exponential equation to logarithmic form, and a logarithmic equation to exponential form.

- ➢ Use the properties of logarithms to expand a logarithmic expression, and to write an expanded logarithmic expression as a single logarithm.

- ➢ Use properties of logarithms to solve exponential equations and logarithmic equations.

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- Final Exam Review (optional)
- MyLabsPlus resources (View an Example, Help Me Solve It, Ask My Instructor, etc.)

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- Final Exam
  - Due: Tuesday
  - Points: 30

SECTION 4: ASSESSMENTS

Exams

Description

There will be an examination after each chapter.

Total Possible Points

140

Grade Weight

75%

Homework Assignments

Description

Homework average from MyLabsPlus will count as one test grade.

Total Possible Points

349

Grade Weight

20%

<h2 style="text-align:center; color:red">**Discussion Forums**</h2>

Description

Complete your post on the discussion board. Then, make a comment on two of your classmates' posts.

Total Possible Points

200

Grade Weight

5%