

SOUTHEASTERN LOUISIANA UNIVERSITY
MATHEMATICS 107 SYLLABUS
effective Fall 2022

COURSE TITLE: APPLIED ALGEBRA

CREDIT: 3 semester hours

ONLINE TEXT: *Applied Mathematical Modeling and Problem Solving*

PUBLISHER: Pearson Education

PREREQUISITE: Minimum Mathematics ACT score of 19 or an appropriate score on the ALEKS test or completion of an appropriate developmental mathematics class with the grade of "C" or better.

COURSE DESCRIPTION: Applied Algebra is an introductory-level course in the study of solving equations and inequalities; function properties and graphs; linear, quadratic, polynomial, exponential and logarithmic functions, and their applications. Only one of MATH 107 or 161 may be used for degree credit.

Delivery of instruction will be via class lectures accompanied by coordinated online homework and quizzes on *MyMathLab* and assignments from the course workbook.

REQUIRED MATERIALS:

- Computer with strong, reliable Internet connectivity
- WebCam (needed if remote instruction becomes necessary)
- TI-30XIIS or B. No other physical or online calculators are allowed on tests or exams, and thus, these calculators are not recommended for use on homework or quizzes. (Note: The four-function calculator found within *MyMathLab* will be available.)
- *Applied Algebra Workbook* – purchased from the Southeastern Bookstore

EMAIL REQUIREMENT: All correspondence will be made through your Southeastern email account.

COURSE GRADES: Percentages earned as follows determine the course grade.

COURSE GRADING SCALE

| | | |
|--------------------|-----------------------|---------------------|
| Homework | = 10% of course grade | 89.50% - 100% = A |
| Quizzes | = 10% of course grade | 79.50% - 89.49% = B |
| Workbook | = 8% of course grade | 69.50% - 79.49% = C |
| Lab Participation | = 8% of course grade | 59.50% - 69.49% = D |
| 4 Unit Tests @ 12% | = 48% of course grade | below 59.50% = F |
| Final Exam* | = 16% of course grade | |

*Final Exam is comprehensive on Units 1, 2, and 4 only.

*All testing must occur in-person, with students on campus for test administration.

MAKE-UP POLICY:

HOMEWORK: Homework will be assigned for each section. Homework need not be completed in one sitting, but it must be completed before the expiration date and time. **You must click the "Submit Homework" button in order for it to count.** At the end of the semester, the two lowest homework scores will be dropped.

Homework may only be accessed after the due date *with instructor permission*. **No makeup work on homework will be allowed once Unit material has culminated in a Unit Test.**

QUIZZES: Quizzes are typically given on material covered in two class periods. You will be able to submit quizzes up to 10 times (with the best score counted). These must also be completed before the expiration date and time. **You must click the "Submit" button in order for it to count.** At the end of the semester, the two lowest quiz scores will be dropped.

Quizzes may only be accessed after the due date *with instructor permission*. **No makeup work on quizzes will be allowed once Unit material has culminated in a Unit Test.**

TESTING:

All tests will be administered in the Math Lab located in Sims Library, Room 208. Consult your Daily Schedule on *MyMathLab* for your test days, when you will meet in the Math Lab instead of your usual classroom.

Students are expected to maintain the highest standards of academic integrity. Behavior that violates these standards is not acceptable. Examples are the use of unauthorized material, communication with fellow students during an examination, attempting to benefit from the work of another student and similar behavior that defeats the intent of an examination or other class work. Cheating on examinations and plagiarism are considered very serious offenses and shall be grounds for disciplinary action as outlined in the current General Catalogue.

In particular, the following are **NOT ALLOWED** during Unit Tests and the Final Exam:

- Procuring help from another person, through electronic devices or otherwise
- Procuring help from a non-sanctioned website
- Cell phone usage
- Accessing *MyMathLab* material in a second browser window when testing is taking place
- Having a second browser window open for any reason other than what is approved by the course instructor
- Use of a calculator other than one required by the course
- Use of notes, workbook pages, or other resources that give definitions, steps to solving problems, or solutions
- Submitting another person's work as your own

If you have any doubt whatsoever regarding what could constitute academic dishonesty, seek clarification from your instructor before use or access.

SPECIFIC COURSE OBJECTIVES – Refer to these when preparing for exams. Students should be able to –

UNIT 1

- use tables and graphs to identify a functional relationship between two variables
- identify the independent and dependent variables in applied problems
- determine the domain and range of a function (including “practical domains”)
- recognize the difference between “functions” and “non-functions” in numerical, verbal, graphical and symbolic formats
- distinguish between discrete and continuous functions
- Use a function model to answer questions related to the situation that the model describes
- use function notation to find values of the independent and dependent variables
- describe in words what a graph indicates about a given situation and create graphs from verbal scenarios
- use translations to obtain new graphs from original graphs and be able to describe translations in equations
- solve linear equations numerically, algebraically, and graphically
- use linear equations to solve applied problems
- use graphs of functions to solve applied problems
- identify intervals on which the graph of a function is increasing, decreasing, and constant
- identify the minimum and maximum points on a graph
- use the vertical line test to determine if a given graph represents a function
- determine the average rate of change of a linear function and interpret it as the slope of a linear function
- find the slope of the line between two points
- find the equations of lines, in particular the equations of parallel, perpendicular, vertical, and horizontal lines
- find intercepts of linear functions
- solve linear inequalities numerically, algebraically, and graphically

UNIT 2

- solve quadratic equations numerically and graphically
- graph quadratic functions and identify them as parabolas
- understand the roles of a , b , c as they relate to the graph of $f(x) = ax^2 + bx + c$
- find the vertex, axis of symmetry, domain, range, and intercepts of a parabola
- interpret the coordinates of points on quadratic graphs in the context of an applied problem
- use translations of graphs to graph functions and find formulas for shifted and/or reflected graphs
- find the vertex of parabolas written in standard form
- use the zero-product principle and the quadratic formula to solve quadratic equations

- use quadratic functions to solve applied problems
- recognize the equivalent forms of a direct variation statement and solve applied direct variation problems
- recognize and graph direct variation functions that are power functions, such as $y = ax^n, n \in \mathbb{N}$
- solve inverse variation equations and recognize them as rational functions where appropriate
- graph inverse variation/rational functions of the form $y = \frac{k}{x^n}, n = 1, 2$

UNIT 3

- use proportional reasoning and unit conversions to solve problems
- derive the formulas for areas of parallelograms, triangles, kites, squares and trapezoids from the area of a rectangle
- solve application problems involving perimeters and areas of common plane figures (squares, rectangles, triangles, circles, parallelograms, etc.)
- solve application problems involving right triangles and the Pythagorean Theorem
- solve application problems involving right triangles and similar triangles
- determine how changes in dimensions affect the perimeters and areas of plane figures
- find volumes and surface areas of three-dimensional figures (prisms and right circular cylinders)
- solve application problems involving prisms and right circular cylinders

UNIT 4

- determine the growth and decay factors of a simple exponential function
- learn and use rules of exponents
- graph exponential functions from equations and numerical data
- solve financial and population growth problems using given exponential equations
- write exponential statements as logarithmic statements, and logarithmic statements as exponential statements
- show that the inverse of an exponential function is a logarithmic function
- determine the properties of the graphs of exponential and logarithmic functions (domain, range, asymptote, intercepts, increasing or decreasing intervals)
- use the properties of logarithms to solve problems
- solve exponential equations numerically, algebraically and numerically
- solve logarithmic equations numerically, algebraically and numerically

PARTICIPATION – in Class & in the Math Lab:

- **Class Meetings:** Every student is expected to attend and actively participate for in-class instruction as listed on your class schedule. The time for the class meeting is not counted toward your Math Lab work requirement.
- **Math Lab Requirement:** Every student is required to work on mathematics in the Math Lab for a minimum of 2 hours every week. (Variations due to holidays and testing will be made. Consult your schedule posted on *MyMathLab* for specifics.) Attendance is counted on a weekly schedule determined by section. Lab attendance each week earns you up to 10 points, determined as follows: at least 2 hours = 10 points, 1 hour to 1 hour, 59 minutes = 5 points, less than 1 hour = 0 points. Attendance will be monitored by your Southeastern ID card swipe, *but it is also your responsibility to keep a record of your attendance.* Your attendance score will be posted by your instructor who will receive weekly updates and can be checked on the gradebook application in *MyMathLab*. While in the lab, you will have access to faculty and peer tutoring, and you must be working on material related to your math class as your time there is counted in your course grade!

If you want to withdraw from this course, it is your responsibility to complete all procedures for dropping a course on your own.

WORKING FROM HOME: The Math 107 online material can be accessed from a student's personal computer. Internet access and the appropriate plug-ins are required in order to use the website where the notes, homework, and exercises are found. The website for this course material is www.pearsonmylabandmastering.com. Once you have registered for your class site in *MyMathLab*, you will be able to login to the site from home with your login and password. Click into your course and run the **Browser Check** found on the main page of your course to ensure the correct setup on your own computer.

NOTE: Students must ensure that all homework and quizzes submitted from home are properly saved on the site. You should check your scores online to ensure that credit has been assigned. If homework and quiz grades are not successfully sent from home and the deadline passes, the student may not be able to make up the work.

Expectations regarding student behavior/classroom decorum: Free discussion, inquiry, and expression is encouraged in this class. Classroom behavior that interferes with either (a) the instructor's ability to conduct the class or (b) the ability of students to benefit from the instruction is not acceptable. Examples may include routinely entering class late or departing early; use of communication devices, or other electronic devices; repeatedly talking in class without being recognized; talking while others are speaking; or arguing in a way that is perceived as "crossing the civility line. Classroom behavior which is deemed inappropriate and cannot be resolved by the student and the faculty member may be referred to the Office of Judicial Affairs for administrative or disciplinary review as per the Code of Student Conduct which may be found at http://www.selu.edu/admin/stu_affairs/handbook/. According to Southeastern Louisiana University policy, students cannot bring children to any classroom for daycare or babysitting.

If you are a qualified student with a disability seeking accommodations under the Americans with Disabilities Act, you are required to self-identify with the Office of Disability Services, Student Union, Room 1304. No accommodations will be granted without documentation from the Office of Disability Services. The deadline for registering or making accommodation changes is two weeks prior to the start of the Final Exam period. Any requests received after the deadline will generally be considered for the following semester.

If you are the victim of a sexually oriented crime, please be aware that the University Policy regarding Victims of Sexual Misconduct is located online at www.southeastern.edu/resources/policies/assets/sexual_misconduct.pdf as well as at page 68 in the University Student Handbook at http://www.southeastern.edu/admin/stu_affairs/handbook/index.html. The policy includes definitions of the various sexually oriented offenses prohibited by Southeastern as well as the reporting options for victims and the process of investigation and disciplinary proceedings of the university. For more information, log onto http://www.southeastern.edu/admin/police/victims_soc/index.html.