

Syllabus for
MAT 105-05 College Algebra
3 Credit Hours
Spring 2018

I. COURSE DESCRIPTION

A treatment that develops the concepts of number systems, absolute value, inequality, domain, range, local extremes, zeros, relations, and functions. Functions studied include those that are linear, polynomial, radical, absolute value, exponential, and logarithmic. (Does not count toward a major or minor in mathematics.)

Course fee: \$30.

II. COURSE GOALS

The purpose of this course is to enable the student to be able to develop the background required for the science or mathematics courses required in pre-medicine, computer science, and pre-engineering (as well as other scientific disciplines). College Algebra and Trigonometry provide the prerequisites for the study of calculus.

III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

A. Objectives

As a result of successfully completing this course, the student will be able to do the following:

1. Identify number sets and apply their basic operations.
2. Define function and relation.
3. Define and determine the domain and range of a given function.
4. Determine symmetries of a graph that relate to the x-axis, y-axis, origin, and the line $y = x$.
5. Identify functions as increasing, decreasing, odd, even, continuous, and discontinuous.
6. Graph given functions that are polynomials, exponentials, and logarithmic.
7. Construct sum, difference, product, and quotient functions from other functions.
8. Discuss the end behavior of a given function.
9. Find zeros of polynomial functions through various methods such as graphing, factoring and synthetic division.
10. Define composite functions and apply this definition to given functions.
11. Define a rational function.
12. List the location of the vertical and horizontal asymptotes of a given function.
13. Describe the function behavior near asymptotes.
14. Define exponential and logarithmic functions.
15. List the characteristics of a basic exponential graph.
16. List the characteristics of a basic logarithmic graph.
17. Discuss the best-fit equation for several regression models.

B. Objectives for Students in Teacher Preparation Programs

The course goals for the Teacher Preparation Program now meet the competency-based requirements established by the Oklahoma Commission on Teacher Preparation. This course meets Subject Competencies 5, 6, 7, 8, and 9.

- SC5: Has a broad and deep knowledge of the concepts, principles, techniques, and reasoning methods of mathematics that is used to set curricular goals and shape teaching.
- SC6: Understands significant connections among mathematical ideas and the applications of these ideas to problem solving in mathematics, in other disciplines, and in the world outside of school.
- SC7: Has experiences with practical applications of mathematical ideas and is able to incorporate these in curricular and instructional decisions.
- SC8: Is proficient in, at least, the mathematics content needed to teach the mathematics skills described in Oklahoma's core curriculum, from multiple perspectives. This includes, but is not limited to, a concrete and abstract understanding of number systems and number theory, geometry and measurement, statistics and probability, functions, algebra, discrete mathematics, and calculus necessary to effectively teach the mathematics skills addressed in the sixth through twelfth grade in the Oklahoma core curriculum. (The depth and breadth of knowledge should be much greater than for the Intermediate Mathematics certification.)
- SC9: Is proficient in the use of a variety of instructional strategies to include, but is not limited to, cooperative learning, use of concrete materials, use of technology (i.e., calculators and computers), and writing strategies to stimulate and facilitate student learning.

IV. TEXTBOOKS AND OTHER LEARNING RESOURCES

A. Required Materials

1. Textbooks
Trigsted, Kirk. College Algebra. 3rd Ed. (eCourse Series)
ISBN: 9780321923745
2. Other – Trigsted eCourse Series MyMathLab Access Kit
This course has **an author-specific access code for MyMathLab**. Please do NOT purchase a generic MyMathLab kit. *MyMathLab* is an online software product that allows the student to do homework math problems accompanied with immediate feedback, context sensitive help, examples, multiple tries for each problem, and pages to read from the textbook. The software also contains a grade book and testing features. The Internet site for the course is <http://www.coursecompass.com/>. Each student will purchase a *MyMathLab* access key code on the Internet site listed above and join the class using the class code provided on the first day of class.
3. A scientific calculator is required. A graphing calculator can be used but is not required.

B. Optional Materials

1. Textbooks
College Algebra. 3rd Ed. eText Reference. 2015. Pearson Education.
ISBN: 9780321869340
2. Other
None

V. POLICIES AND PROCEDURES

A. University Policies and Procedures

1. Attendance at each class or laboratory is mandatory at Oral Roberts University. Excessive absences can reduce a student's grade or deny credit for the course.
2. Students taking a late exam because of an unauthorized absence are charged a (\$15) late exam fee.
3. Students and faculty at Oral Roberts University must adhere to all laws addressing the ethical use of others' materials, whether it is in the form of print, electronic, video, multimedia, or computer software. Plagiarism and other forms of cheating involve both lying and stealing and are violations of ORU's Honor Code: "I will not cheat or plagiarize; I will do my own academic work and will not inappropriately collaborate with other students on assignments." Plagiarism is usually defined as copying someone else's ideas, words, or sentence structure and submitting them as one's own. Other forms of academic dishonesty include (but are not limited to) the following:
 - a. Submitting another's work as one's own or colluding with someone else and submitting that work as though it were his or hers;
 - b. Failing to meet group assignment or project requirements while claiming to have done so;
 - c. Failing to cite sources used in a paper;
 - d. Creating results for experiments, observations, interviews, or projects that were not done;
 - e. Receiving or giving unauthorized help on assignments.By submitting an assignment in any form, the student gives permission for the assignment to be checked for plagiarism, either by submitting the work for electronic verification or by other means. Penalties for any of the above infractions may result in disciplinary action including failing the assignment or failing the course or expulsion from the University, as determined by department and University guidelines.
4. Final exams cannot be given before their scheduled times. Students need to check the final exam schedule before planning return flights or other events at the end of the semester.
5. Students are to be in compliance with University, school, and departmental policies regarding Whole Person Assessment (WPA) requirements. Students should consult the WPA handbooks for requirements regarding general education and the students' majors.
 - a. The penalty for not submitting electronically or for incorrectly submitting an artifact is a zero for that assignment.
 - b. By submitting an assignment, the student gives permission for the assignment to be assessed electronically.

B. Department Policies and Procedures

1. Computer Resources - Each Student who uses the computer is given access to the appropriate computer resources. These limited resources and privileges are given to allow students to perform course assignments. Abuse of these privileges will result in their curtailment. Students should note that the contents of computer directories are subject to review by instructors and the computer administrative staff.
2. Late Exams - Each instructor has his or her own late-exam policy, so an instructor may decide that an exam missed because of an unexcused absence cannot be made up.

3. Unexcused Absences - Any student whose unexcused absences total 33% or more of the total number of class sessions will receive an F for the course grade.
4. Incompletes – As stated in the University catalog, incompletes are granted only for “good cause,” such as extended hospitalization, long-term illness, or a death in the family. Students must petition for an incomplete using the form available in the Computing and Mathematics Department. Very few incompletes are granted.

C. Course Policies and Procedures

1. Evaluation Procedures

The weight distribution of course work is as follows with the final grade based on performance in six categories:

Homework	20%
Reading Assessments/Quizzes	10%
Projects/Other Assignments	10%
Exams	40%
Comprehensive Final Exam	20%

Evaluation Procedures may vary according to the software available and instructor preferences.

2. Whole Person Assessment Requirements

None

3. Other Policies and/or Procedures

- a. Homework and other assignments will be detailed through Desire2Learn, MyMathLab, or assigned in class. **Purchase of MyMathLab is required.** Completing the homework is essential. Because mathematics builds upon previously developed concepts, your progress in the learning process depends upon proper pacing. The best way to ensure maximum learning is for each student to give immediate attention to each assignment presented. Homework assignments topics are given in Part VI of this syllabus.
- b. All ORU students are expected to take one college-level mathematics course. If the material in this course along with the material in Trigonometry (MAT 106) was studied in high school, the student is encouraged to take Calculus I (MAT 201).

VI. COURSE CALENDAR

Day	Section	Topic
Chapter R: Review Chapter 1-2		
Chapter 1: Equations, Inequalities, and Applications		
3	1.1	Linear Equations
4	1.2	Applications of Linear Equations
5	1.3	Complex Numbers
6	1.4	Quadratic Equations
7	1.5	Applications of Quadratic Equations
8	1.6	Other Types of Equations
9	1.7	Linear Inequalities
10	1.8	Absolute Value Equations and Inequalities
11	1.9	Polynomial and Rational Inequalities
12		REVIEW
13		TEST (Chapter 1)
Chapter 2: The Rectangular Coordinate System, Lines, and Circles		
14	2.1	The Rectangular Coordinate System
15	2.2	Circles
16	2.3	Lines
17	2.4	Parallel and Perpendicular Lines
18		REVIEW
19		(Instructor Preference)
Chapter 3: Functions		
20	3.1	Relations and Functions
21	3.2	Properties of a Function's Graph
22	3.3	Graphs of Basic Functions; Piecewise Functions
23	3.4	Transformations of Functions
24	3.5	The Algebra of Functions; Composite Functions
25	3.6	One-to-One Functions; Inverse Functions
26		REVIEW
27		TEST (Chapter 3)
Chapter 4: Polynomial and Rational Functions		
28	4.1	Quadratic Functions
29	4.2	Applications and Modeling of Quadratic Functions
30	4.3	The Graphs of Polynomial Functions
31	4.4	Synthetic Division; The Remainder and Factor Theorems
32	4.5	The Zeros of Polynomial Functions; The Fundamental Theorem of Algebra
33	4.6	Rational Functions
34		REVIEW
35		TEST (Chapter 4)

Chapter 5: Exponential and Logarithmic Functions and Equations

36	5.1	Exponential Functions
37	5.2	Logarithmic Functions
38	5.3	Properties of Logarithms
39	5.4	Exponential and Logarithmic Equations
40	5.5	Applications of Exponential and Logarithmic Functions
41		REVIEW
42		TEST (Chapter 5)

Chapter 7: Systems of Equations and Inequalities

43	7.1	Systems of Linear Equations in Two Variables
44	7.2/7.3(E)	Systems of Linear Equations in Three Variables
45	7.4(E)	Partial Fraction Decomposition
46	7.5	Systems of Nonlinear Equations
47	7.6	Systems of Inequalities
48		REVIEW FOR FINAL EXAM
49		REVIEW FOR FINAL EXAM

Chapter sections marked with (E) are considered enrichment topics. Instructor will determine which topics to cover as time allows.

Course Inventory for ORU's Student Learning Outcomes
MAT 105-05 College Algebra
Spring 2018

This course contributes to the ORU student learning outcomes as indicated below:

Significant Contribution – Addresses the outcome directly and includes targeted assessment.

Moderate Contribution – Addresses the outcome directly or indirectly and includes some assessment.

Minimal Contribution – Addresses the outcome indirectly and includes little or no assessment.

No Contribution – Does not address the outcome.

The Student Learning Glossary at <http://ir.oru.edu/doc/glossary.pdf> defines each outcome and each of the proficiencies/capacities.

OUTCOMES & Proficiencies/Capacities		Significant Contribution	Moderate Contribution	Minimal Contribution	No Contribution
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1	Outcome #1 – Spiritually Alive Proficiencies/Capacities				
1A	Biblical knowledge				X
1B	Sensitivity to the Holy Spirit			X	
1C	Evangelistic capability				X
1D	Ethical behavior			X	

2	Outcome #2 – Intellectually Alert Proficiencies/Capacities				
2A	Critical thinking	X			
2B	Information literacy			X	
2C	Global & historical perspectives			X	
2D	Aesthetic appreciation				X
2E	Intellectual creativity	X			

3	Outcome #3 – Physically Disciplined Proficiencies/Capacities				
3A	Healthy lifestyle				X
3B	Physically disciplined lifestyle				X

4	Outcome #4 – Socially Adept Proficiencies/Capacities				
4A	Communication skills		X		
4B	Interpersonal skills		X		
4C	Appreciation of cultural & linguistic differences				X
4D	Responsible citizenship			X	
4E	Leadership capacity			X	