COURSE SYLLABUS
MAT165: Algebra II

Course Description

MAT165 Algebra II continues and expands the foundation established in MAT162 Algebra I. This algebra course serves as the foundation for statistics and discrete mathematics which is critical to the Information Technology Industry. Topics include Rational expression and functions, A review of and extension of the use of Quadratic equations, Exponential and Logarithmic Functions, Nonlinear functions, Statistical Concepts, Counting processes, Set Theory, Introduction of Boolean Algebra and Graph and Game Theory towards Decision-Making tools.

General Course Information

Number of Units/Weeks	4/10
#Hours Lecture/#Hours Laboratory/#Hours Homework	40/00/80
Prerequisite(s)	MAT162 Algebra I
Co-requisites (s)	None
Course Developer(s)	Dr. Tem E. Bugarin
Date Submitted / Date Approved / Last Review	February 6, 2017

Learning Outcomes

- Understand and apply basic terminology, properties, and operations of Rational Complex Expressions and Functions.
- Understand the concept of variation as it applies to quantitative data.
- Simplify, understand, and apply operations involving radical and complex numbers and expressions.
- Create mathematical equations from word problems, conversion and providing solutions between word problems and mathematical formulas involving multi-variable equations specifically quadratic functions, and polynomials.
- Graphically examine and understand the behavior of non-linear equations to include parabolas and circular equations, point of inflections, maximum and minimum graphical points.
- Understand inverse functions and associated operations of exponentials, logarithmic, natural logarithms, and applications.
- Understand the associated operations nonlinear functions and systems, conic sections, circle, elliptical, hyperbola functions, and second degree equalities, inequalities and systems of multi-degreed equality and inequality functions.
- Understanding the operations and applications of sequence operations including series, arithmetic, and geometric, sequence.
- Understanding and the operation and application in decision-making of the Binomial Theorem.

- Introduction to and understanding basic concepts involving the Discrete Probability Distribution.
- Introduction to and understanding basic concepts involving the Continuous Probability Distribution.
- Understanding the basic operations and the application of counting with and without replacement, Venn Diagram to visualize set relationships, Permutation and Combination Techniques and applications.
- Understanding the basic concepts of and introduction to the application of Boolean algebra.
- Use a scientific calculator to perform numerical operations

Instructional Methods Employed in this Course

- Lecture and reading assignments
- Hands-on exercises demonstrated in class and Homework assignments
- Exams
- Practical application of theory
- Build on prior knowledge and experience of students to enhance richness of class activities

Information Resources for this Course

Textbook

Lial, Margaret L., Hornsby, John and McGinnis, A., (2004) Intermediate Algebra, 11th edition. Addison, Wesley, and Longman.

Dossey, John A., Otto, A.D., Spence, L.E., and Eynden, C. V., (2006) Discrete Mathematics, 5th edition. Pearson Education, Inc.

Larson, Ron and Farber, Betsy. (2012) Elementary Statistics Picturing The World, 5th edition. Pearson Education, Inc.

Other Materials

Calculator: Graphing Calculator: Casio FX-9750GII or equivalent graphing calculator

Web Site Readings

www.purplemath.com

www.khanacademy.org

Table/Topics & Assignments

Types of Assignments:

Lecture -
Considered Lecture Hours

Classroom Discussion -
Considered Lecture Hours

In Class Critique -
Considered Lecture Hours

In Class (IC) Exercise -
Considered Homework, work done in class as part of a Learning Team

Reading -
Considered Homework, work done outside of class

Homework lesson
Considered Homework, work done outside of class

Quiz, Midterm or Final -
Considered work in class by individuals

Type	Topic / Description	LEC Hours	HW: Hours	Point Value	Due
LEC 1A	Review Operations of the Radical expressions and complex numbers, exponents, and operations.	3	--	--	
HW 1A - IC	Selected Problems from Section 8.1 to 8.4 to be accomplished in class (Counts as participation points).	1	1	10	Week 1
HW 1A - ExHWK	Selected Problems from Section 8.1 - 8.4	--	7	40	Week 2
Total Week 1		4	8	50	
Type	**Topic / Description**	**LEC Hours**	**HW: Hours**	**Point Value**	**Due**
LEC 2A	Continue with the review of operations of radical and complex expressions. Additionally, Factoring multi-variate polynomials such as quadratic equations.	3	--		
HW 2A - IC	Selected Problems from Section 8.5 - 9.1 to be accomplished in class (Counts as participation points).	1	1		Week 2
HW 2A - ExHWK	Selected Problems from Section 8.5- 9.1	--	8		Week 3

Total Week 2		4	9	0	
Type	**Topic / Description**	**LEC Hours**	**HW: Hours**	**Point Value**	**Due**
LEC 3A	Review of and graphing of quadratic equations, parabolas, applications, polynomial and rational inequalities.	2	--	--	
HW 3A - IC	Selected Problems from Section 9.2 - 9.7 to be accomplished in class (Counts as participation points).	0.45	0.45	10	Week 3
HW 3A - ExHWK	Selected Problems from Sections 9.2 - 9.7	--	6	40	Week 4
Quiz #1 - 3B	Quiz #1 Section 8.1 – 9.1 applications	1.15	2.15	150	Week 3
Total Week 3		4	9	200	
Type	**Topic / Description**	**LEC Hours**	**HW: Hours**	**Point Value**	**Due**
LEC 4A	Inverse, Exponential, Logarithmic, and properties of functions and applications.	3	--	--	
HW 4A - IC	Selected Problems from Section 10.1 – 10.5.	1	1	10	Week 4
HW 4A - ExHWK	Selected Problems from Section 10.1 – 10.5.	'-- -	8	40	Week 5
Total Week 4		4	9	50	
Type	**Topic / Description**	**LEC Hours**	**HW: Hours**	**Point Value**	**Due**
LEC 5A	Continue examining exponential, logarithmic, properties and applications.	3	--	--	
HW 5A - IC	Selected Problems from Section 10.6, and Section 11.1 - 11.3	1	1	10	Week 5
HW 5A - ExHWK	Selected Problems from Section 10.6, and Section 11.1 - 11.3	--	8	40	Week 6
Total Week 5		4	9	50	
Type	**Topic / Description**	**LEC Hours**	**HW: Hours**	**Point Value**	**Due**
LEC 6A	Nonlinear systems of equations, second-degree inequalities and systems of inequalities. Introduction to Sequence and series.	2	--	--	

HW 6A - IC	Selected Problems from Section 11.4 - 11.5 to be accomplished in class (Counts as participation points).	0.45	0.45	10	Week 6
HW 6A - ExHWK	Selected Problems from Sections 11.4 -- 11.5	--	6	40	Week 7
Quiz #2 - 6B	Quiz #2 Section 9.2 – 11.3 applications	1.15	2.15	150	Week 3
Total Week 6		2.45	6.45	50	
Type	**Topic / Description**	**LEC Hours**	**HW: Hours**	**Point Value**	**Due**
LEC 7A	Sequence and series including Arithmetic, Geometric sequence and Introduction to the Binomial Theorem.	3	--	--	
HW 7A - IC	Selected Problems from Section 12.1 - 12.4 to be accomplished in class (Counts as participation points).	1	1	10	Week 7
HW 7A - ExHWK	Selected Problems from Section 12.1 - 12.4		8	40	Week 8
Total Week 7		4	9	50	
Type	**Topic / Description**	**LEC Hours**	**HW: Hours**	**Point Value**	**Due**
LEC 8A	Review of Geometric sequences and applications, Binomial Theorem and applications, Counting: Permutations& Combinations. Introductory probability techniques and Hypergeometric Probability.	3	--	--	
HW 8A - IC	Selected Problems from Section 12.3 - 12.4 to be accomplished in class (Counts as participation points). Larson chp 3 Section 3.1 - 3.4	1	1	10	Week 8
HW 8A - ExHWK	Selected Problems from Sections 12.3 - 12.4. Larson Chp 3 Section 3.1 - 3.4	--	8	40	Week 9
Total Week 8		4	9	50	
Type	**Topic / Description**	**LEC Hours**	**HW: Hours**	**Point Value**	**Due**

LEC 9A	Continue with Probability and Statistics techniques; Permutation and combination techniques. Boolean Algebra, Venn Diagram, and Probability and Statistics basics.	3	--	--	
HW 9A - IC	Selected Problems from Larson Chapter 4 Section 4.1 - 4.3 Discrete Probability and Chapter 5 Normal Probability Distributions Section 5.1 -5.4 to be accomplished in class (Counts as participation points).	1	1	10	Week 9
HW 9A - ExHWK	Selected Problems from Larson Chapter 4 Section 4.1 - 4.3 Discrete Probability and Chapter 5 Normal Probability Distributions Section 5.1 -5.4 .	--	8	40	Week 10
Total Week 9		4	9	50	
Type	**Topic / Description**	**LEC Hours**	**HW: Hours**	**Point Value**	**Due**
LEC 10A	Review	1			
EXAM 10B	Final Exam Lial Chapter 11 and 12. Including Basic Introductory Statistics from Larson Chapter 4, 5, and 6 (questions from Larson will be basic introductory in nature.)	3	--	250	Week 10
Total Week 10		4	0	250	

Course Hours Summary

Week	Topic	LEC Hours	LAB Hours	HW Hours
1	Operations on Real Numbers	4	0	8
2	Properties of Real Numbers and Linear Equations	4	0	9
3	Linear and Component Inequalities & Exam 1	4	0	9
4	Rectangle Coordinates System and Graphing	4	0	9
5	Linear Inequalities in One Variable	4	0	9
6	Exponents, Polynomials, Function and Quiz #2	4	0	9
7	Application and Factoring Polynomials	4	0	9
8	General approach to factoring	4	0	9
9	Operations of Rational and Complex Functions	4	0	9
10	Review, Quiz #3 / Exam 3	4	0	0
Total		40	0	80

Table/Point Breakdown

Assignment	Possible Points	Percent of Grade
Homework 1A	50	5%
Homework 2A	50	5%
Homework 3A	50	5%
Quiz #1	150	15%
Homework 4A	50	5%
Homework 5A	50	5%
Homework 6A	50	5%
Quiz #2	150	15%
Homework 7A	50	5%
Homework 8A	50	5%
Homework 9A	50	5%
Quiz #3 / Final Exam	250	25%
	1000	100%

Your Grades for this Course

Your final grade for this course will be based on an assessment by the Instructor of your performance on a number of course activities, which may include objective tests, classroom exercises, or other types of activities. The chart below indicates in what activities you will engage, how many possible points can be earned for each activity, and the percentage of your final grade that will be accounted for by each activity.

Students in this course should be graded following Coleman University assessment practices and policies. A point system is used in the University to indicate student performance on various required activities or projects. For this course, it is recommended that points be distributed as follows:

Coleman University Grade Assignment Policy:

Percent	Letter Grade	Grade Points
94-100	A	4
90-93	A-	3.67
87-89	B+	3.33
84-86	B	3
80-83	B-	2.67
77-79	C+	2.33
74-76	C	2
70-73	C-	1.67
67-69	D+	1.33
64-66	D	1
60-63	D-	0.67
N/A	INC	0
N/A	W	0
60 or above	CR	0
59 or below	NC	0
N/A	I	0
N/A	W	0
N/A	AU	0
N/A	TR	0
N/A	WV	0

Legend	
CR = Credit	NC = No Credit
I = Incomplete	W = Course Withdrawal
AU = Audit	TR = Transfer Credit
WV = Waiver	

Academic Accommodation / Adjustment Policy:

In accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA), Coleman University offers accommodations to students with documented physical, psychological, and/or cognitive disabilities. Coleman University will adhere to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations as required to offer equal educational opportunities to qualified disabled individuals.

To qualify for an academic accommodation under ADA, the student must provide adequate documentation of a disability. Students seeking academic accommodations should contact the campus ADA Coordinator at 858-966-3953 or via email at ada@coleman.edu. The ADA Coordinator will review the documentation provided and verify ADA coverage. Students covered under ADA must meet with the ADA Coordinator at the beginning of every term to determine the appropriate academic accommodations. Failing to meet with the ADA Coordinator at the beginning of every term may impact the availability of accommodations.

After the academic accommodations have been determined, the students' instructors will be notified by the ADA Coordinator. If any problems or concerns regarding the provision of accommodations occur, the student must inform the ADA Coordinator. If the student feels accommodation is not being made appropriately, the student may follow the published Student Grievance Procedures.