Syllabus: *Math 151 College Algebra*

Course Information

Course Prefix/Number: Math 151	Credit Hours: 4
Semester: Fall 2016	Course Title: College Algebra
Class Days/Times: Monday & Wednesday 1:15 PM to 2:55 PM	Room: A - 3

Instructor Information: Name: Jorge Guarin	Phone/Voice Mail: (520) 383-0101 E-mail: jguarin@tocc.edu Office location: Main Campus, Building A Office hours: TBA

Course Description:

Introduction to college-level algebra. Includes functions, polynomial and rational functions, exponential and logarithmic functions, linear 2 x 2 and higher systems, graphing, sequences and series, and calculator use.

Course Objectives:

During this course students will
1. Define a function in terms of ordered pairs, graphically, and algebraically.
2. Determine the domain of a function, and determine whether an element is in the range of a function.
3. Use the algebra of functions and composition of functions defined by the modes in objective 1.
4. Use the definition of one-to-one function and compute the inverse of a one-to-one function.
5. Define and calculate, exactly and by approximation, zeros and intercepts of functions.
6. Perform basic operations with complex numbers.
7. Find the zeros of polynomial functions algebraically and by approximation.
8. Given its zeros and their multiplicities, construct a polynomial function and sketch its graph.
9. Graph rational functions.
10. Solve nonlinear inequalities algebraically and graphically.
11. Use the properties of exponential functions.
12. Use the concept of inverse functions to develop and work with logarithmic functions.
13. Solve exponential and logarithmic equations.
14. Solve applications, by algebraic means and by approximation, using polynomial, radical, power, rational, exponential, and logarithmic functions.
15. Solve and classify solutions of 2 x 2 and higher systems of linear equations by matrix methods.
16. Solve application problems using linear systems.
17. Use the distance formula with simple applications.
18. Find the nth and general terms of sequences, including arithmetic and geometric sequences and sequences recursively defined.

19. Calculate sums of finite arithmetic and geometric series and convergent infinite geometric series.
20. Use graphing calculators (or other technology).

Student Learning Outcomes (SLOs) :

   After completion of the course students will be able to

- Perform basic matrices operations using calculators.
- Create mathematical models using a variety of functions.
- Employ technology to set up and solve real world situations.

Texts and Materials:

Required Text: College Algebra, by Larson,9th Edition, ISBN – 13 9781133963028. **Checking out and returning an iPad is a requirement to obtain a grade in this class.** APPS: The "Free GraCalc" app is recommended.

Evaluation and Grading & Assignments:

  Attendance:

The attendance policy for this class is simple. You are all adults who have in some form paid for this class. If you do not wish to come to any session, you do not have to attend. However, you are still responsible for completing work on time. If you are late for class, enter quietly and sit down. You will not be allowed to make up any quiz you miss because of tardiness. In case of a valid emergency, contact the instructor using the information given on the first page. After filling out an absence form, the instructor will decide whether or not the work missed can be made up.

Academic Integrity: Violations of scholastic ethics are considered serious offenses by Tohono O'odham Community College, the Mathematics Department, and by your instructor. Students may consult the TOCC Student Handbook sections on student code of conduct, on scholastic ethics and on the grade appeal procedure.

[*a*] All homework can be done independently or with other students. The purpose of homework is to develop critical thinking skills and also to develop specific skills related to teaching mathematics by repeated practice of these skills. Without this practice most students find it impossible to perform well in this class. No collaboration is tolerated during exams in-class exams.

[*b*] Students are expected to abide by the Student Code of Conduct and the Scholastic Code of Conduct found in the Tohono O'odham Community College Student Handbook. Copies are available at the main student bookstore.

Course Feedback:

All materials submitted will be graded and returned the next class period after they are submitted.

Homework Policy:

Homework will be assigned each class period and is due at the beginning of the next class period before the quiz. The solutions to all odd-numbered problems in the text are given in the back of the textbook, or on the web site www//chatcalc.com.   Homework sets will contain both even and odd-numbered problems. Late homework will not be accepted unless the student has made an arrangement with the instructor before it is to be turned in.

Withdrawals:

Please be sure to withdraw yourself by **October 26, 2016** if you do not expect to complete the class, otherwise you may receive an "F" grade.

Workload:

Students are expected to spend an average of 18 hours per week attending class sessions, doing assignments and preparing for exams. The standard Carnegie Unit of college credit assigns one credit hour for each 15 hours of class time and assumes that students spend two hours working outside the classroom for each hour of classroom instruction. For a three-credit semester course, this translates to an average of 12 hours spent outside of class weekly for 8 weeks.

Grading System/Policies:

Your final grade will be calculated as follows:		Grading Scale
5 homework assignments	200 points	
5 quizzes	150 points	A = 1000 - 900 points
5 tests	350 points	B = 899 - 800 points
1 project	100 points	C = 799 - 700 points
1 final exam	200 points	D = 699 - 600 points
Total possible	**1000 points**	F = less than 600 points

Incomplete (I) grade:
To receive an " I " grade, you must have finished at least 3/4 of the course requirements and specifically request the grade. Please call before the last week of class to be sure that there is sufficient time to consider your request. An incomplete grade generally implies that a student has shown sufficient initiative to complete the course on his or her own. You will receive a copy of the standard "I" form filed with the grade. This form details specifically what must be done to complete the course. A student has one year to complete the required work, after which the grade automatically reverts to an "F."

Make-up Assignments:
No make-up assignments will be given and no late assignments will be accepted unless the student has made arrangements with the instructor.

Extra Credit Opportunities: Do not ask for extra credit opportunities until you have completed all of the required assignments to date. The instructor will occasionally give extra credit homework, quiz, and exam questions that test critical thinking skills.

Final Grades: Students will receive a grade transcript from the college mailed to the address given with registration materials at the end of the semester when all grades have been recorded.

SPECIAL NOTE TO STUDENT: For privacy and security reasons, instructors are advised **NOT** to give grades over the telephone.

Course Outline:
I. Functions
    A. Definition
        1. By ordered pairs from table or other sources
        2. Graphically
        3. Algebraically
    B. Domain and range
        1. Determine the domain
        2. Determine whether a number is in the range; find the range in other cases
    C. Computations
        1. Algebra of functions
        2. Composition
        3. Find the inverse of a one-to-one function
        4. The zeros of functions
II. Polynomial and Rational Functions
    A. Computations
        1. Identify zeros and y-intercepts
        2. Remainder and Factor Theorems
        3. Fundamental Theorem of Algebra
        4. Applications of polynomials
        5. Non-linear inequalities
        6. Complex number solutions

B. Second degree polynomials
  1. Complete square to put in form to identify vertex
  2. Applications of maximum/minimum type
C. Rational Functions
  1. Use properties of polynomials to analyze rational functions
  2. Applications of rational functions

III. Exponential and Logarithmic Functions
  A. Properties and relationships
    1. Relate exponential and logarithmic as inverse functions
    2. Properties of logarithms
  B. Problem solving
    1. Use part A to solve exponential and logarithmic equations
    2. Formulate and solve applied problems using exponential and logarithmic functions.

IV. Linear 2 x 2 and Higher Systems
  A. Solutions
    1. Identify solutions as ordered n-tuples
    2. Classify systems as consistent or inconsistent
    3. Applications of systems
  B. Methods of solution
    1. By matrix methods
      a. Gaussian elimination
      b. Inverse matrix method
    2. Cramer's rule (optional)

V. Graphing
  A. Determine and graph intercepts, zeros, and asymptotes for functions and equations in general, and, in particular, for the types of functions listed above
  B. Use translations, reflections, and similar operations to obtain a new graph from a given graph
  C. Use graphs to interpret and analyze applied problems
    1. The distance formula
    2. Circles
    3. Radical and power functions

VI. Sequences and Series
  A. Sequences
    1. Definition
    2. Determine n^{th} terms for recursively defined sequences
    3. Determine n^{th} terms for arithmetic and geometric sequences
  B. Series
    1. Definition
    2. Calculate sums of finite arithmetic and geometric series and convergent infinite geometric series
  C. Applications of sequences and series

VII. Calculator Use
  A. Numerical calculations and evaluation of functions
  B. Graph and analyze functions
  C. Matrix computations
  D. Other applications such as programs

VIII. Optional Topics
  A. Combinatorics
  B. The Binomial Theorem
  C. Conic sections
  D. Systems equations which include nonlinear equations

DISCLAIMER: This syllabus is designed to evolve and change throughout the semester based on class progress and interests. You will be notified of any changes as they occur.

#	Day	Date	Sections	Hw Due	Test
1	Monday	8/15/2016	Review Chap P	P.1 - P.6	**Chap P**
2	Wednesday	8/17/2016	1.1 - 1.2		Pre Ch 1
3	Monday	8/22/2016	1.3 - 1.4	1.1-1.2	
4	Wednesday	8/24/2016	1.4 - 1.5	1.3	
T0	**Wednesday**	**8/24/2016**	**P.1 - P.6**	**Quiz 0**	**Chap P**
5	Monday	8/29/2016	1.5 - 1.6	1.4	
6	Wednesday	8/31/2016	1.6 - 1.7	1.5	
NC	**Monday**	**9/5/2016**	**Labor Day-No Class**		
7	Wednesday	9/7/2016	1.7 - 1.8	1.6	
8	Monday	9/12/2016	Review Chap 1	1.7-1.8	**Quiz 1**
T1	**Monday**	**9/12/2016**	**1.1 - 1.8**	**Quiz 1**	**Chap 1**
9	Wednesday	9/14/2016	2.1 - 2.2		Pre Ch 2
10	Monday	9/19/2016	2.2 - 2.3	2.1	
11	Wednesday	9/21/2016	2.3 - 2.4	2.2	
12	Monday	9/26/2016	2.4 - 2.5	2.3	
13	Wednesday	9/28/2016	2.5 - 2.6	2.4	
14	Monday	10/3/2016	2.6 - 2.7	2.5	
15	Wednesday	10/5/2016	Review Chap 2	2.6-2.7	**Quiz 2**
T2	**Wednesday**	**10/5/2016**	**2.1 - 2.7**	**Quiz 2**	**Chap 2**
16	Monday	10/10/2016	3.1 - 3.2		Pre Ch 3
17	Wednesday	10/12/2016	3.2 - 3.3	3.1	
18	Monday	10/17/2016	3.3 - 3.4	3.2	
19	Wednesday	10/19/2016	3.4 -3.5	3.3	
20	Monday	10/24/2016	Review Chap 3	3.4-3.5	**Quiz 3**
T3	**Monday**	**10/24/2016**	**3.1 - 3.5**	**Quiz 3**	**Chap 3**
21	Wednesday	10/26/2016	5.1		Pre Ch 5
22	Monday	10/31/2016	5.2	5.1	
23	Wednesday	11/2/2016	5.3	5.2	
24	Monday	11/7/2016	5.4	5.3	
25	Wednesday	11/9/2016	5.5	5.4	
26	Monday	11/14/2016	Review Chap 5	5.5	**Quiz 4**
T4	**Wednesday**	**11/9/2016**	**5.1 - 5.5**	**Quiz 4**	**Chap 5**
27	Wednesday	11/16/2016	6.1 - 6.2		
28	Monday	11/21/2016	6.2 - 6.3		
29	Wednesday	11/23/2016	8.1 - 8.2		
30	Monday	11/28/2016	8.2 - 8.3		
31	Wednesday	11/30/2016	Review Ch 6 & 8		
T5	**Wednesday**	**11/30/2016**	**6.1 - 8.3**		**Ch 6 & 8**
32	Monday	12/5/2016	Review Final Exam		
FE	**Wednesday**	**12/7/2016**	**1.1 - 8.3**		**Final Exam**

Hw #	Quiz	Chapter	Section	Page	Numbers	Score
Hw 1		P	P.1	62	1-30 ALL	
			P.2	62	31-60 ALL	
			P.3	63	61-80 ALL	
			P.4	64	81-90 ALL	
			P.5	64	91-102 ALL	
			P.6	64	103-114 ALL	
	Q 1	P	Chapter P Test	65	1 - 19 ALL	
Test 1		P				
Hw 2		1	1.1	152	1-20 ALL	
			1.2	152	21-38 ALL	
			1.3	153	39-46 ALL	
			1.4	153	47-58 ALL	
			1.5	153	59-74 ALL	
			1.6	154	75-90 ALL	
			1.7	154	91-102 ALL	
			1.8	154	103-110 ALL	
	Q 2	1	Chapter 1 Test	155	1 - 22 ALL	
Test 2		1				
Hw 3		2	2.1	233	1-14 All	
			2.2	233	15-26 All	
			2.3	233	27-42 All	
			2.4	234	43-50 All	
			2.5	234	51-60 All	
			2.6	234	61-66 All	
			2.7	234	67-74 All	
	Q 3	2	Chapter 2 Test	235	1 - 22 ALL	
Test 3		2				
Hw 4		3	3.1	302	1-26 EOO	
			3.2	303	27-50 ALL	
			3.3	303	51-68 ALL	
			3.4	304	69-100 ALL	
			3.5	305	101-108 ALL	
	Q 4	3	Chapter 3 Test	306	1 - 18 ALL	
Test 4		3				
Hw 5		5	5.1	414	1-32 EOO	
			5.2	414	33-58 ALL	
			5.3	415	59-80 ALL	
			5.4	415	59-106 ALL	
			5.5	416	107-117 ALL	
	Q 5	5	Chapter 5 Test	306	1 - 18 ALL	
Test 5		5	5.1 - 5.5	417	1 - 29 ALL	
Final Exam		P - 2	Cumm Test P-2	236	1-47 ALL	
Final Exam		3 & 5	Cumm Test 3-5	418	1-10,20-36	

Date: _____

Acknowledgment of Receipt of Syllabus

Please read, sign and return the following acknowledgment to me in class, or return to me at the following address:

Jorge Guarin
Tohono O'odham Community College
P.O. Box 3129
Sells, AZ 85634

☐   I have received my MAT 151 syllabus (including course objectives, policies, requirements and schedule) and have read and understood all the enclosed materials

☐   I have no objection to receiving an occasional call from the instructor at the number given with my registration materials.

☐   I prefer that the instructor not call or contact me by phone anytime during the semester.

My reason(s) for taking this course:
_____
_____
_____

My background in this area includes:
_____
_____
_____

☐   I would like to be contacted by the instructor regarding the following concerns:
_____
_____
_____
_____

_____   _____
Print Name Clearly Here   Sign Name Here

_____   _____
Student ID Number   Telephone Number

_____   _____
Current Mailing Address/City/State/Zip   E-mail Address