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## Syllabus: **Math 151 College Algebra**

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### Course Information

Course Prefix/Number: Math 151 - 2	Credit Hours: 4
Semester: Spring 2018	Course Title: College Algebra
Class Days/Times: Tuesday - Wednesday 2:00 PM – 3:40 PM	Room: A-3

<b>Instructor Information:</b> Name: Jorge Guarin	Phone/Voice Mail: (520) 383-0101 E-mail: <a href="mailto:jguarin@tocc.edu">jguarin@tocc.edu</a> Office location: Main Campus, Building A Office hours: To Be Determined
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### Course Description:

Introduction to college-level algebra. Includes functions, polynomial and rational functions, exponential and logarithmic functions, linear  $2 \times 2$  and higher systems, graphing, sequences and series, and iPad 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  $2 \times 2$  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  $n^{\text{th}}$  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**

- Graph, analyze and perform function operations using iPads.
- Create mathematical models using a variety of functions.
- Employ technology to set up and solve real world situations.

**Himdag Cultural Component:**

Mathematics faculty's interpretation of what Nahban said in the "Desert Smells Like Rain" is this: While the Himdag discourages direct, exact answers, in the mathematical world, my students are expected to be able to come up with a precise answer for the situation. As a community college closely associated with the Tohono O'odham Nation, TOCC encourages growth of students' cultural knowledge and my class takes steps to transmit learning mathematics in a way that respects the Tohono O'odham Himdag.

**Texts and Materials:** An iPad is required for this class. **Checking out and returning an Ipad from the Library is a requirement to obtain a grade in this class.**

**Required Text:** College Algebra. Publisher: EDUCO and it is available on the EDUCO site To enter to this site, students need to get the **ACCESS CODE** from the library.

**APPS:** The "Free GraCalc 2" and "My script calc" apps can be downloaded from the Apple store..

**Evaluation and Grading & Assignments:****Attendance:**

The attendance policy for this class is simple and it gives you 10% of your grade . 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, email your instructor using the information given on the first page. After receiving the email, the instructor will decide whether or not can give you an excused absence.

**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:**

Homework by Sections, Chapter Tests. Practice Chapter Tests, Practice Final Exam and Final Exam have been posted on the EDUCO site: [www.educosoft.com](http://www.educosoft.com). All materials submitted will be graded and they scores returned immediately after they are submitted. Students can take up to 3 times any homework, Test or Final Exam. Higher score will be recorded. Datelines for every assignment is on the site. Once the assignment expires, it is removed and you can not continue taking it..

**Homework Policy:**

Homework has been assigned and it is posted on the EDUCO site: Each one comes with its own dateline. You must submit the homework before its dateline.

**Withdrawals:**

Please be sure to withdraw yourself by **March 30, 2018** 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 6 hours spent outside of class weekly for 16 weeks.

**Grading System/Policies:**

Your final grade will be calculated as follows:			Grading Scale	
Attendance	100 points	10%	A =	1000 - 900 points
Homework assignments	200 points	20%	B =	899 - 800 points
Chapter Tests	300 points	30%	C =	799 - 700 points
Tutorial Time	200 points	20%	D =	699 - 600 points
Final Exam	200 points	20%	F =	less than 600 points
<u>Total possible</u>	<u>1,000 points</u>	<u>100%</u>		

**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. At any time, at the EDUCO site, [educosoft.com](http://educosoft.com) you are able to see your grade.

**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
- 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  $n^{\text{th}}$  terms for recursively defined sequences
    3. Determine  $n^{\text{th}}$  terms for arithmetic and geometric sequences
  - B. Series
    1. Definition
    2. Calculate sums of finite arithmetic and geometric series and convergent infinite geometric series
- VII. iPad Use
- A. Numerical calculations and evaluation of functions
  - B. Graph and analyze functions
  - C. Matrix computations
  - D. Other applications such as apps

**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	Tuesday	1/16/2018	Class Overview		
2	Thursday	1/18/2018	1.1 - 1.2		
3	Tuesday	1/23/2018	1.2 - 1.3		
4	Thursday	1/25/2018	1.3 - 1.4	1.1 - 1.2	
5	Tuesday	1/30/2018	1.4 - 1.5		
6	Thursday	2/1/2018	1.5 - 1.6	1.3 - 1.4	
7	Tuesday	2/6/2018	1.6 - Review Test 1	1.5 - 1.6	
<b>T1</b>			<b>Ch 1: 1.1 - 1.6</b>		<b>Ch 1</b>
8	Thursday	2/8/2018	2.1 - 2.2		
9	Tuesday	2/13/2018	2.2 - 2.3		
10	Thursday	2/15/2018	2.3 - 2.4	2.1 - 2.2	
11	Tuesday	2/20/2018	2.4 - 2.5		
12	Thursday	2/22/2018	2.5 - 2.6	2.2 - 2.3	
13	Tuesday	2/27/2018	2.6 - Review Test 2	2.5 - 2.6	
<b>T2</b>			<b>Ch 2: 2.1 - 2.6</b>		<b>Ch 2</b>
14	Thursday	3/1/2018	3.1 - 3.2		
15	Tuesday	3/6/2018	3.2 - 3.3		
16	Thursday	3/8/2018	3.4 - 3.5	3.1 - 3.2	
NC	Tuesday	3/13/2018	Spring Break		
NC	Thursday	3/15/2018	Spring Break		
17	Tuesday	3/20/2018	3.6 - 3.7	<b>3.3 - 3.4</b>	
18	Thursday	3/22/2018	Review Test 3	<b>3.5 - 3.7</b>	
<b>T3</b>			<b>Ch 3: 3.1 - 3.7</b>		<b>Chap 3</b>
19	Tuesday	3/27/2018	4.1 - 4.2		
20	Thursday	3/29/2018	4.2 - 4.3		
21	Tuesday	4/3/2018	4.3 - 4.4	4.1 - 4.2	
22	Thursday	4/5/2018	4.4 - 4.5		
23	Tuesday	4/10/2018	4.5 - 4.6	4.3 - 4.4	
24	Thursday	4/12/2018	4.6 - Review Test 4	4.5 - 4.6	
<b>T3</b>			<b>Ch 4: 4.1 - 4.6</b>		<b>Chap 4</b>
25	Tuesday	4/17/2018	5.1 - 5.2		
26	Thursday	4/19/2018	5.2 - 5.3		
27	Tuesday	4/24/2018	5.3 - 5.4	5.1 - 5.2	
28	Thursday	4/26/2018	5.4 - 5.5		
29	Tuesday	5/1/2018	5.5 - 5.6	5.3 - 5.4	
30	Thursday	5/3/2018	5.6 - Review Test 5	5.5 - 5.6	
<b>T4</b>			<b>Ch 5: 5.1 - 5.6</b>		<b>Chap 5</b>
31	Tuesday	5/8/2018	Review Final Exam		
<b>FE</b>	Thursday	<b>5/10/2018</b>	<b>1.1 - 5.6</b>		<b>Final Exam</b>

## Acknowledgment of Receipt of Syllabus

**Date: January 16, 2018**

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:

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My background in this area includes:

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

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Print Name Clearly Here

Sign Name Here

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Student ID Number

Telephone Number

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Current Mailing Address/City/State/Zip

E-mail Address