MAT 151: College Algebra

Class Days/Times/Room: Monday, Tuesday, and Wednesday (*lu:nas c maltis c miaklos*), 9:36 to 10:26, the former tech room H-7, Baboquivari HS, Topawa The dual enrollment section / MAT 151 3	Spring (*hu:kalig*) 2017

Instructor: Richard LEE	Regular Phone: 520 383 0062 please contact BHS front office for emergencies E-mail: rlee@tocc.edu

Course Description:
Introduction to college-level algebra, including 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 n^{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

- Use the skills of arithmetic and algebra, in isolation and in application, with and without technologies (including but not restricted to calculators and computer programs).
- Express themselves visually (in graphing functions and) in presenting their answers to real-life problems.
- Perform basic matrix operations using calculators.
- Create mathematical models using a variety of functions.
- Employ technology to set up and solve real world situations.

Course Structure:
This course will be operating on a combination of traditional lecture, group activity, and discussions that will enhance the student's knowledge of mathematical concepts. **Much** of this work will need to be done outside of class.

Texts and Materials:
Much like last semester's Intermediate Algebra here in Topawa, we will be using a combination of handouts from two sources (1) the free *College Algebra* text by Abramson et al. sponsored by OpenStax College in cooperation with the Bill and Melinda Gates Foundation and Rice University - http://cnx.org/content/col11759/latest, and (2) my own handouts from various texts.

You **will** need some access to a graphing device, be it on graphing calculator, a laptop, an iPad, or as a downloadable app on either an iPhone or Android phone.

Evaluation and Grading & Assignments:
Three tests at 100 points = 300 - while calculating devices are allowed, you will need to know how to express **exact** answers and to **draw** free-hand graphs.
One comprehensive final exam = 100
Quizzes - weekly, based on questions I assign from homework = 100

An A requires 500 x .9 = 450 points. A B will require 500 x .8 = 400 points.

***Himdag* Cultural Component:**
My interpretation of what Nahban said in *the Desert Smells Like Rain* is this: while the *himdag* discourages direct, exact answers, in the mathematical world, one is expected to be able to come up with a precise answer for the situation. That being said, there are a few common issues shared:

- *Baban* (coyotes) are not going to affect your homework or my tests – they didn't write either. (Certainly beats the classic "My dog ate my homework!")
- While one must go through a maze to see *i'itoi*, there was no mention as to how many mazes there were to get to him. Likewise, you will discover that there are many different ways to perform the math necessary to see the final answer.
- ***I-we:tma*: for your success, the college's and the community's, DO NOT work alone – it is a group activity (except on the tests, of course).**
- *T-Wohocudadag c t-apedag c t-pik elida*: We learn for our well-being. We respect each other, ourselves and our community. We respect and take pride in our own work. We respect each other's abilities, quirks and privacy. We believe in ourselves and others.

Prerequisites and destinations:
To be in this class, you must have

- passed math 122 here with a C or better, or
- tested into this class with a suitable COMPASS score (41 to 65 in Algebra), or
- obtained permission of both the instructor and your counselor (Ms. Key), usually after review of previous coursework grades.

Upon successful completion of this course, you will be taking math 187: Precalculus. Furthermore, you will have a transferrable mathematics credit at the college level. (Depending on your major, you may have completed your mathematics requirement.)

Policies and expectations-

- **Attendance will be enforced per Baboquivari HS rules**. You are responsible for any material covered in class. In addition to normal BHS procedures, e-mail me at **rlee@tocc.edu** if you miss class.
- Integrity and Honor: I don't mind if you work on the homework in groups. In fact, I expect it. (See *i-we:tma* on previous page.) I will mind for tests and the final exam. Everything else about this topic is available in both *the TOCC Student Handbook as well as the BHS Student Handbook*.
- Homework and Feedback: Homework may be late - don't make it habit. (We go fast enough that it's not necessary for me to discipline you on it.) I will try to return homework within one class – not every question will be checked, but I will be using what you have done wrong as a springboard for class. (If you're wondering how I can get away with accepting late homework, see the next point. ☺) For this semester, you should spend 3 credit hrs x 3 hrs a week per credit hr = **9** hours a week on this course.
- **Almost every week, there will be a graded one to two question quiz based on what I cover in class and in homework. Makeups for these will be RARE.**
- **Withdrawal from this course will be handled under BHS guidelines**. (At TOCC, our final withdrawal date is **April 3rd 2017**.) By that date, you will have had at least two tests. *All institutions of higher education strongly encourage instructors NEVER to ask students to withdraw from a course for both financial aid purposes and respect for the student.* (See *t-pik elida* on previous page.) Again, we will have three tests, a final exam, homework and attendance in class.
- **Incompletes (I) will be handled under BHS guidelines**. (TOCC allows for an entire year for makeup if at least 75% of the course has been attempted; however, we understand you are under BHS and State of Arizona guidelines.)
- Makeups: My homework policy has been mentioned beforehand. As for exams, I allow a *reasonable* amount of time – not more than two weeks.
- Final grades: They will be available electronically via TOCC Jenzabar - and posted to your BHS transcripts (and mailed out with your BHS report cards). Per FERPA and the *Himdag*, I will not give grades over the phone and am strongly discouraged from e-mailing same. (Again, see *t-pik elida* above.)
- Struggling? Tutoring is available - speak to Ms. Key for advice - also, please practice *i-we:mta* and work off of each other.
- In accordance with *t-pik elida* and the Americans with Disability Act 1990 (ADA) and Section 504 of the Rehabilitation Act, if you have a learning problem, physical disability, or medical illness that requires you to have any special arrangements, please inform your instructor at the beginning of the semester so your academic performance will not suffer because of the disability or handicap.

Consolidated Course Outline and Homework Assignments.
To be determined - this is a tentative outline and quite subject to change.

Date	*Topic*	*Done?*
1/2/2017	(Objective 1) Review section 3.1 - What's a function? IN CLASS: ODDS 27-39. OUT OF CLASS: EVENS 28-38.	
1/3/2017	(Objective 2) Section 3.2 - Domain and range, or "Miligan, you can't go there!" IN CLASS: ODDS 1-37. OUT OF CLASS: EVENS 2-36.	
1/4/2017	**Quiz on 3.1** More on section 3.2. IN CLASS: ODDS 39-53. OUT OF CLASS: EVENS 38-54.	
1/9/2017	Section 3.3 - Rate of change - a grown-up slope. Also, how fast are you going when you're on top of a hill or bottom of a valley? IN CLASS: 5, 11, 13, ODDS 19-25 OUT OF CLASS: 6, 12, 14 EVENS 18-24	
1/10/2017	no class, personal business	
1/11/2017	**Quiz on 3.2** (objective 3) Handout - the algebra of functions: f+g, f-g, fg, f/g Section 3.4 - Composition of functions, or this goes into that… Homework TBA	
1/16/2017	no class, Dr. Martin Luther King day	
1/17/2017	(TOCC main campuses open) More on 3.4	
1/18/2017	**Quiz on 3.3 and 3.4** Chapter 4 diagnostic "practice test" - linear equations / functions Homework TBA	
1/23/2017	(Depending on results of Chapter 4 diagnostic - Review and/or cover material.) If successful - 5.1 Polynomial functions, homework TBA	
1/24/2017	5.2 Power functions, homework TBA	
1/25/2017	**Quiz on 5.1** (objective 8 in part) 5.3 Graphing quadratic functions, homework TBA	
1/30/2017	Review for TEST 1 5.4 Dividing polynomials, by traditional and synthetic division, homework TBA	
1/31/2017	**TEST 1 on 3.1 to 3.4 and algebra of functions, 5.1 only**	
2/1/2017	NO QUIZ (objectives 5 and 7) 5.5 Zeroes / solutions / x-intercepts of polynomial functions - or what happens when you go beyond factoring and the quadratic formula, homework TBA	

2/6/2017	More on section 5.5, homework TBA	
2/7/2017	(objective 9) 5.6 Rational functions, or things become weird when you can't divide by zero, homework TBA	
2/8/2017	**Quiz on 5.2 to 5.4** (objective 4) 5.7 Inverses and Radical functions (please review composition of functions), homework TBA	
2/13/2017	(objective 6) 2.4 Imaginary and complex numbers, homework TBA	
2/14/2017	(objectives 11 to 13) Chapter 6 - logarithmic and exponential functions, homework TBA	
2/15/2017	**Quiz TBA** more on Chapter 6, homework TBA	
2/20/2017	BHS and TOCC closed - Presidents Day	
2/21/2017	more on Chapter 6, homework TBA	
2/22/2017	**Quiz TBA** more on Chapter 6, homework TBA	
2/27/2017	Review for Test 2	
2/28/2017	**TEST 2 on Ch 5, 2.4 and some of Ch 6**	
3/1/2017	NO QUIZ (objectives 10, 15 and 16) Chapter 7 - Systems of equations and inequalities, homework TBA	
3/6/2017	more on Chapter 7, homework TBA	
3/7/2017	more on Chapter 7, homework TBA	
3/8/2017	**Quiz TBA** more on Chapter 7, homework TBA	
3/13/2017	(objectives 18 and 19) Chapter 9 - sequences and series, homework TBA	
3/14/2017	more on Chapter 9, homework TBA	
3/15/2017	**Quiz TBA** more on Chapter 9, homework TBA	
3/20/2017	(TOCC Break) We'll still have class. More on Chapter 9, homework TBA.	
3/21/2017	(TOCC Break) We'll still have class. More on Chapter 9, homework TBA.	
3/22/2017	(TOCC Break) **Quiz TBA** We'll still have class. More on Chapter 9, homework TBA.	

3/27/2017	Review for test 3	
3/28/2017	**Test 3 on Chapters 7 and most of 9**	
3/29/2017	NO QUIZ Sections 3.5 to 3.7, or how to blow up and shrink graphs. Supplements - how to solve ANY equation	
4/3/2017	Rest of the schedule here is TBA	
4/4/2017	Rest of the schedule here is TBA	
4/5/2017	**Quiz TBA** Rest of the schedule here is TBA	
4/10/2017	Rest of the schedule here is TBA	
4/11/2017	Rest of the schedule here is TBA	
4/12/2017	**Quiz TBA** Rest of the schedule here is TBA	
4/17/2017	Your spring break	
4/18/2017	Your spring break	
4/19/2017	Your spring break	
4/24/2017	Rest of the schedule here is TBA	
4/25/2017	Review for Final Exam	
4/26/2017	**FINAL EXAM**	

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.

References:

- Furlonge, Isaac. (2016.) *Course syllabus.*
- Guarin, Jorge. (2011.) *Course syllabus.*
- Hronopoulos, Sophia. (2012.) *Course syllabus.*
- Nabhan, Gary Paul. (1982.) *The Desert Smells Like Rain: A naturalist in Papago Indian Country.* San Francisco: North Point Press.
- Newberry, Teresa. (2012.) *Course syllabus.*
- Sun-bat, Catherine. (2014.) *Course syllabus*
- Tohono O'odham Community College core values website http://www.tocc.edu/core_values.htm (2015.)

Assignment	Date	Score
Test 1	1/31/2017	
Test 2	2/28/2017	
Test 3	3/28/2017	
Final	4/26/2017	
Homework	various	180 x __ (number of assignments checked in) / __ total assigned = _____
Attendance	various	out of 20
Total		Add the numbers you have in this column = _____

A detailed errata page for *College Algebra* is available.