![Lake Superior State University logo]

College of Innovations and Solutions   **Spring 2023**
MATH 111 – College Algebra (3,0)   **3 Credits**

Prerequisites: Two years of high school algebra equivalent/ satisfactory score on ACT or Placement Exam or MATH 102 with a grade of C or better. High school plane geometry also recommended.

Instructor: George Voutsadakis, CAS 206E, 906-635-2667, gvoutsad@lssu.edu

Office Hours:

Monday	Tuesday	Wednesday	Thursday	Friday
2:00 - 2:50		8:00-8:50 1:00-1:50		1:00-2:50

Required Text: Open source book available at: https://openstax.org/details/books/college-algebra

Course Description: This course is a study of families of functions through formulas, tables, graphs and words, emphasizing applications in business, life and social science. The function families include linear, polynomial, rational, exponential, logarithmic, and power functions. Within these families, topics include problem solving, model creation, solving equations, systems of equations and inequalities, rates of change, graphing, analysis, and interpretation.

Course Learning Outcomes: At the conclusion of MATH111 successful students will be able to:

1. Solve problems presented in the context of real world situations, with emphasis on model creation, prediction and interpretation. This will be done using multiple perspectives, including formulas, tables, graphs, and words. (This includes determining if a given formula, table, graph or situation represents a function, as well as finding the domain and range.)
2. Calculate the average rate of change of a function using the slope formula or simplify the average rate of change using the difference quotient.
3. Define, evaluate, graph and analyze linear functions and solve linear equations and systems. (The analysis will include finding slopes, input/output values, intercepts, and intersections, as well as determining if data are linear.)
4. Define, evaluate, graph and analyze exponential functions, and solve exponential equations. (The analysis will include finding input/output values, using growth/decay rates, and determining if data are exponential.)
5. Define, evaluate, graph and analyze logarithmic functions, and solve logarithmic equations. (The analysis will include finding input/output values, comparing inputs/outputs of logarithmic scales using ratios, and using properties of logarithms to evaluate functions and solve equations.)
6. Define, evaluate, graph and analyze power functions, and solve power equations. (The analysis will include finding input/output values, and determining concavity.)
7. Define, evaluate, graph and analyze polynomial and piece-wise polynomial functions, and solve polynomial equations. (The analysis will include finding input/output values, finding zeros, and optimization.)
8. Perform operations on functions such as transformations, compositions and inversions.
9. Solve polynomial inequalities.

General Education Objectives: This course is designed to meet the Mathematics General Education Outcome. Students will be able to analyze situations symbolically and quantitatively in order to make decisions and solve problems.

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This course contributes to LSSU's Institutional Learning Outcomes by addressing:

2. Use of Evidence: Students will identify the need for, gather, and accurately process the appropriate type, quality, and quantity of evidence to answer a complex question or solve a complex problem.
3. Analysis and Synthesis: Students will organize and synthesize evidence, ideas, or works of imagination to answer an open-ended question, draw a conclusion, achieve a goal, or create a substantial work of art.

Grading Scale and Policies:

Exams   200 pts (4 x 50)
Final Exam 100 pts
Quizzes   100 pts (10 x 10)

Total   400 pts

Grading Scale (%) **A** 90-100 (includes +/-) **B** 80-89 **C** 65-79 **D** 50-64 **F** 0-49

Grading Policies: You will be graded on correct methodology, i.e., if you provide an answer but show no work or your work is incorrect, you will receive no credit. Your solutions must be written in a connected, step-by-step logical fashion and all variables should be clearly defined. If your solution is not written clearly, you will not receive full credit. In many cases, setting up the correct mathematical model and using this model to solve a problem will be just as important as computing a numerical answer.

The homework exercises for each section covered are on the last page of this handout. You should spend a lot of your math study time doing homework. If you are struggling with your homework seek help from your instructor or the tutors in the Learning Center.

*Ground Rules***:**
1. Calculator: The TI-83/84 Plus is the recommended calculator for this course. Your instructor reserves the right to ask you to solve problems in class, during quizzes and during exams without the use of a calculator. All other electronic devices (computers, PDAs, cell phones etc.), must be turned off for all class lecture sessions.
2. Purpose of Lecture: Lectures are an opportunity for students to ask questions and seek clarification on material. This implies student preparation has been accomplished prior to class. Lecture is also the opportunity for the instructor to coordinate coverage of the material and present material that is historically or potentially difficult. It does not negate student preparation or study.
3. Attendance Policy: Attendance is strongly encouraged. If you miss a class, or are late, you are still responsible for class notes and assignments. Moreover, **you will be assigned a 0 score should a quiz take place during that missed lecture**.
4. Make-up Policy: Each exam should be taken at the designated time. An exam may be taken prior to or after the scheduled date, by agreement with the instructor, provided that the student provides a request with a **documented valid excuse well in advance of the scheduled date**. **If an absence is unexcused, no make-up will be provided, either for exams or for quizzes**.
5. Academic Integrity: Students are expected to perform all assigned work themselves. Any form of cheating or plagiarism will be handled in accordance with the Academic Integrity Procedures. Violations of the University Academic Integrity Policy may result in an F course grade.
6. Testing: Use of head phones, cell phones and hats during exams is prohibited.

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__University Policies and Statements__:

Online and Blended Course Attendance Policy

Students in online or blended classes are required to log in to the Course Management System (Moodle) and complete at least one "Academic Related Activity" within the Add/Drop period.

The Americans with Disabilities Act & Accommodations

Lake Superior State University is committed to following the requirements of the Americans with Disabilities Act Amendments Act and Section 504 of the Rehabilitation Act. This university is also dedicated to providing equal opportunity for participation in all programs, services and activities. If you are a student with a disability or think you may have a disability, please contact Accessibility Services, KJS Library #233, (906) 635-2355, accessibility@lssu.edu to discuss your request further. Once you have registered with Accessibility Services, students should contact their instructor as early as possible for assistance with classroom accommodations.

Academic Success Center

To support you on your academic path, the Academic Success Center (ASC) is free for all students and is located on the main floor of the library. The ASC offers walk in sessions for the math center, consultations with the writing center, and tutoring sessions by appointment. In addition, many classes offer supplemental instruction, which are group sessions tailored to your course content. Contact the Academic Success Center at academicsuccess@lssu.edu to set up an appointment

Laker Success

The Laker Success program is designed to help you gain control over your learning through proactive communication and goal setting, through the development of learning skills and study habits, and through personal accountability. The Laker Success staff is committed to working with students to develop an individualized plan to achieve academic and personal goals. Students can initiate contact with Laker Success on their own via email at lakersuccess@lssu.edu or by visiting the Student Engagement Center in Cisler Center, Room 100. Students may be also directed to Laker Success by their advisor, by an instructor, by the Scholastic Standards / Financial Appeals Committees, or by the Provost's Office. If at mid-term your grades reflect that you may not attain a passing grade in one, some, or all of your classes, a Laker Success staff member will contact you. You may email lakersuccess@lssu.edu if you want to sign up early in the semester or if you have questions or concerns.

Add/Drop Policy

Courses can be added or dropped through Anchor Access until the sixth day of the semester (fourth day for the Summer semester). After this date, students need the instructor's permission to add a course. For additional details about add/drop or withdrawal, go to:
https://www.lssu.edu/registrar/scheduling/adddrop-courses-withdrawal-information/

Related dates for this semester can be viewed at: https://www.lssu.edu/registrar/important-dates/

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Tentative Course Outline

Week	Dates	Monday	Wednesday	Friday
1	01/16	MLK	3.1	3.2
2	01/23	3.3	3.4	3.4
3	01/30	3.5	3.5	3.6
4	02/06	3.7	Review	Exam 1
5	02/13	4.1	4.2	4.3
6	02/20	5.1	5.2	5.3
7	02/27	5.4	Review	Exam 2
8	03/06	BREAK	BREAK	BREAK
9	03/13	5.5	5.6	5.6
10	03/20	5.7	5.8	6.1
11	03/27	6.2	Review	Exam 3
12	04/03	6.3	6.4	6.5
13	04/10	6.6	6.7-6.8	7.1
14	04/17	7.2	Review	Exam 4
15	04/24	7.3	7.4	Review

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<u>**Suggested Practice**</u>

**STUDY 1-2 HOURS EVERY DAY! DO NOT LET UNDONE HOMEWORK ACCUMULATE!
IF YOU HAVE ANY QUESTIONS, BRING THEM IN TO CLASS OR VISIT ME AT THE
OFFICE!!**

Section	Problems
3.1	6,7,8,10,17,18,28,30,32,34,37,38,40,41,44,47,52,53,55,56,57,61,62,66,67,70,72
3.2	7,9,10,15,18,28,29,32,35,36,38,40,41,42,46,48,50,51,52,53,54
3.3	5,10,12,17,18,20,21,22,23,24,25,26,29,32,34
3.4	5,8,9,11,12,13,16,20,21,26,31,37,40,41,42,43,46,48,58,59,62,64,73,74,75,90,92,93
3.5	6,7,8,9,13,14,18,19,24,25,26,27,30,32,34,38,43,44,45,47,49,50,53,54,56,58,59,66,66,68, 70,71,78,79,80
3.6	5,6,9,11,12,22,26,27,40,41
3.7	6,7,11,12,13,15,17,18,23,24,29,30,31,32,34,36,37,38,39,40,45,47
4.1	9,11,14,16,22,24,27,30,32,37,38,39,42,45,49,50,52,55,58,60,70,72,75,76,81,89,90,94, 114,115,120
4.2	6,8,9,10,25,26,27,28,29,30,42,43,44,46,48,50,54,56
4.3	6,9,12,14,15,16,17,22,23,25,26,28,37,38,39,40
5.1	6,10,12,14,18,20,22,23,26,27,30,35,38,40,45,46,48,67,69,73
5.2	7,9,11,14,15,19,20,21,23,25,27,29,30,31,33,36,39,40,42,44,52,58,66,68,70
5.3	10,14,16,20,22,32,36,39,40,42,44,48,50,54,56,58,59,61,65,75,78
5.4	4,6,11,13,14,16,26,35,38,40,42,44,46,49,51,52,65,67,71
5.5	7,10,13,15,18,23,29,35,37,56,57,59,71,72,75
5.6	11,12,13,16,21,23,39,45,49,51,53,57,63,81,84,87
5.7	5,7,9,13,15,17,19,23,25,31,33,41,42,44,57,59,60,63
5.8	5,7,11,15,19,21,25,31,37,39,52,54,57,58
6.1	4,5,6,9,10,11,15,17,18,21,22,23,26,31,51,53,61,62,64,67
6.2	3,5,19,20,21,22,23,26,27,28,33,35,36,37,39,40,41,42,43,45
6.3	7,9,11,13,14,15,17,19,21,24,25,27,29,31,34,35,37,39,43,44,45,46,47,49,50,51,53,64,65
6.4	6,7,9,11,12,13,14,17,19,31,32,33,38,39,40,41,43,44,47,48,49
6.5	3,5,7,9,10,11,12,15,17,19,20,21,23,25,26,27,29,30,31,32
6.6	5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,44,45,47,55,57,59,62,67
6.7	7,8,9,10,11,12,13,15,17,18,19,20,21,22,33,35,37,43,44,45,50,51,52
6.8	6,7,8,9,10,11,12,13,14,16,17,18,19,20,31,32,33,34,35,36,37,38,39,40,51,52,53,54,55
7.1	7,10,11,13,19,21,23,25,31,33,35,37,42,43,58,59,63,67,69,73
7.2	7,9,11,13,14,17,19,21,29,31,41,43,51,55,59,63,67,69
7.3	6,7,9,12,13,14,16,17,19,22,27,29,30,33,35,37,39,41,43
7.4	7,9,13,17,21,23,27,31,35,39,45,49,51
7.5	7,9,11,13,15,19,21,23,24,25,27,31,33,35,37,39,41,43,45
7.6	6,7,9,11,13,18,19,21,23,29,31,37,41,43,52,53,57,58,60