Math 2803	**Transition to Advanced Mathematics**	Fall 2022
Section: 002	MWF 12:55 – 1:45 PM	Prof. Matthew Clay
	AFLS D113	

Office: SCEN 326 **Email**: mattclay@uark.edu **Phone**: 575–5195

Office Hours: Monday: 9:00 – 10:00, Tuesday: 1:00 – 2:00 and Friday: 9:00 – 10:00
If you are unable to use any of the above times, please make an appointment.

Text: *Mathematical Reasoning: Writing and Proof*, Verison 3, by Ted Sundstrom, CreateSpace Independent Publishing Platform

Prerequisites: Math 2554 with a grade of C or better.

Class Delivery: Classes will consist of in-person lectures which entail a discussion of course material, worked examples and small group activities. Attendance is required and class lectures will not be recorded.

Learning Objectives:
- Construct and analyze elementary mathematical arguments
- Demonstrate proficiency with proof methods involving logic, induction and contradiction
- Understand basic set operations and employ these operations correctly
- Identify key properties of functions and relations
- Construct and verify formulas based on patterns
- Produce counterexamples to false statements
- Employ correct problem solving strategy

Topics:
- Writing proofs: direct proofs, proofs by contrapositive and contradiction, proofs by induction
- Logic: statements, logical operators, logical equivalence, quantifiers, negation
- Set theory: definition of a set, set operations and constructions
- Functions and relations: properties of functions, composition, inverse functions, equivalence relations
- Integer properties: modular arithmetic, divisors, divisibility, primes, greatest common divisor, least common multiple
- Cardinality: finite sets, infinite sets, countable sets, uncountable sets

The course will cover the majority of Chapters 1 – 9 of the text.

Written Assignments: There will be weekly assignments taken from selected exercises in the text. Work can be handwritten or typed using software for producing mathematical equations and formulae such as LaTeX or Equation Tools in Microsoft Word. Illegible homework will be returned without a grade. You are encouraged to brainstorm and discuss the problems with other students. If you collaborate with other students you must follow these rules:

- state the other students' names; and
- the solutions must be written individually, with your own words.

Solutions copied from any source (print/online/another student's work), with identical or nearly identical wording will be given a score of 0, and will be considered a case of plagiarism, which therefore may be investigated by the academic integrity unit.

Graded assignments can be resubmitted once and the two grades will be averaged. The lowest score will be dropped.

Homework assignments are very important to the learning process. Math is not a spectator sport, the only way to get better is to practice.

Exams: There will be three exams during the semester and a final exam. These exams will take place in class unless other arrangements are made. A make-up for any exam will not be given without a compelling reason and the instructor's *prior consent. You must inform the instructor before the exam* if you are to miss it due to illness, University related activity or religious holiday.

Calculators: Calculators are not permitted on any quiz or exam.

Course Grade:
- Attendance and Participation   - 10%
- Written Assignments   - 35%
- Exam 1 (Friday, September 16)   - 13%
- Exam 2 (Wednesday, October 12)   - 13%
- Exam 3 (Wednesday, November 9)   - 13%
- Final (Monday, December 12, 12:45 – 2:45 PM)   - 16%

Letter grades: $A : 100 - 90$; $B : 89 - 80$; $C : 79 - 70$; $D : 69 - 60$; $F : 59 - 0$

All scores posted on or before Dead Day will be deemed accurate unless a possible error is brought to the attention of the instructor before the scheduled final exam.

Important Dates

Monday, August 22	Classes Start
Friday, September 2	Last day to drop without W
Monday, September 5	Labor Day
Friday, September 16	In class exam 1 (13% of grade)
Wednesday, October 12	In class exam 2 (13% of grade)
Monday, October 24 – Tuesday, October 25	Fall Break
Wednesday, November 9	In class exam 3 (13% of grade)
Friday, November 18	Last day to drop with W
Wednesday, November 23 – Friday, November 25	Thanksgiving Holiday
Thursday, December 8	Last day of classes
Monday, December 12	Final Exam (12:45 – 2:45 PM) (16% of grade)

See `http://registrar.uark.edu` *for the complete academic calendar and final exam schedule.*

Academic Honesty Policy: As a core part of its mission, the University of Arkansas provides students with the opportunity to further their educational goals through programs of study and research in an environment that promotes freedom of inquiry and academic responsibility. Accomplishing this mission is only possible when intellectual honesty and individual integrity prevail. Each University of Arkansas student is required to be familiar with and abide by the University's "Academic Integrity Policy" which may be found at `http://honesty.uark.edu`. Students with questions about how these policies apply to a particular course or assignment should immediately contact their instructor.

Special Accommodation: Students who are registered with the Center for Educational Access must notify the instructor in writing by the end of the first week of class, or within one week of registering with CEA.

Inclement Weather Policy: Class will be held if the University is officially open. Allowances will be made if you are unable to safely reach the campus, but, bravely, class will go on! Do not call the Math office for inclement weather information. Instead, you should call the following telephone number: 575-7000.

Disclaimer: Information on this syllabus is subject to change. Any change will be announced on Blackboard and during the regular meeting time.