

## Salisbury University Department of Mathematical Sciences

**MATH 300 : Introduction to Abstract Mathematics**  
**Syllabus (Tentative)**

**Description:** Designed for students majoring and minoring in mathematics. Students experience the power of mathematical thought and develop facility with mathematical expression, both written and oral. Assignments make use of both inductive and deductive reasoning. 3 Hours Credit: Meets three hours per week.

**Prerequisites:** C or better in MATH 210 or equivalent.

**Intended Audience:** Students minoring in mathematics, particularly prospective teachers, will find this course a good capstone to their undergraduate mathematical experience. Students majoring in mathematics who have not already completed a 400-level mathematics course will find this a valuable course to help them develop a better understanding of the connection between computational and theoretical mathematics.

**Objective:** To provide students with an opportunity to develop the foundations of abstract mathematics.

**Textbooks:** *Mathematical Reasoning: Writing and Proof*, version 3.0, by Ted Sundstrom. Available as a free PDF download from <https://www.tedsundstrom.com/mathreasoning-reasoning-3>

Topic	Weeks
<b>Logic and Proof</b>	3
Methods of proof – direct, contraposition, contradiction, induction; logical operators; logical equivalence; logical negation; recursion	
<b>Sets and Functions</b>	3
Set theory; properties of functions; compositions of functions; Inverse functions; functions acting on sets	
<b>Equivalence Relations</b>	2
Relations; equivalence classes; modular arithmetic	
<b>Number Theory</b>	3
Division algorithm; greatest common divisor; prime factorization; Euclidean algorithm; Diophantine equations; congruence	
<b>Finite and Infinite Sets</b>	2
Cardinality; countable and uncountable sets; Cantor’s Diagonal Argument	
<b>Tests</b>	1
<b>Total</b>	<b>14</b>

**Evaluation**

Coursework	20 – 30%
Tests	40 – 50%
Final Exam	20 – 30%

- Clear descriptions of thought processes, evidence of critical thinking, and effective communication must be demonstrated in written work.
- **Writing Across the Curriculum:** Students will be expected to communicate mathematics and mathematical ideas effectively in speech and writing. At the University Writing Center, trained consultants are ready to help you at any stage of the writing process. In addition to the important writing instruction that occurs in the classroom and during professors’ office hours, the Center offers another site for learning about writing. **All students are encouraged to make use of these important services.**
- **NOTE:** Once a student has received credit, including transfer credit, for a course, credit may not be received for any course with material that is equivalent to it or is a prerequisite for it.