

# Math 3163: Introduction to Modern Abstract Algebra

Section 003, Smith 201, Tuesday 5 – 7:45pm

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Office Hours: Monday 12:30 - 2pm, Tuesday 3:30 - 5pm, & by appointment

**Class website:** <http://www.math.uncc.edu/~sjbirdso/modalg>

**Text:** Abstract Algebra – an Introduction, 2<sup>nd</sup> Edition, Thomas W. Hungerford

**Prerequisite:** Math 1242 and Math 2164 with a grade of C or better or by permission of the department.

**Grading Scheme:** There will be 3 chapter tests during the semester and a cumulative final exam (Tuesday, May 8, 5 – 7:30pm). On a day when a test is scheduled, the first half of the class period will be dedicated for the exam; and during the second half of the class, we will cover new material. Homework will be given throughout the semester. When a homework set is given (either as questions from the textbook or from a typed sheet), it will be due the following class.

Tests	45%
Homework	25%
Final Exam (cumulative)	30%

**Topics/Objectives:** In this course, we will cover chapters 1 – 6 in our text. We will look at examples and elementary properties of basic algebraic structures, especially groups and rings. This course will also emphasize writing proofs for elementary theorems (ie: we will be learning how to “write” mathematics).

**Attendance Policy:** I expect every student to attend each class and will take attendance. If you do miss a class, it is your responsibility to get any notes you may have missed and to understand the material on your own.

**Homework Information:** Since this is a proof course, most questions will entail you proving a given statement by use of definitions, theorems, and logic. Since this is a writing intensive course, you will be required to write your proofs in complete sentences, using complete words (no abbreviations allowed). Each proof you write needs to have a clear beginning, middle, and end. The beginning must clearly state any information with which you start. Typically, the beginning is where you restate the “if” part of the statement you are asked to prove. The end must clearly state the conclusion you get. Typically, this is where you restate the “then” part of the statement you are asked to prove. The middle of the proof is where you write down all of the steps that links the beginning to the end. At least for the first part of the semester, we will write down every step of a proof. We also must justify each step by referencing something known (ie: a definition, theorem, lemma, etc). Towards the end of the semester, we may start combining obvious steps.

Because this is a writing intensive course, many symbols will not be accepted in proofs for credit. See below for a list of the common acceptable and unacceptable symbols. Points will be deducted for failing to write your proofs in complete sentences, including proper punctuation and grammar, the over use of symbols, or the use of forbidden symbols. If in doubt, write out the word instead of the symbol you want to use.

**Acceptable Symbols:**  $=, \neq, +, -, \cdot, \times, \oplus, \otimes, \odot, a^n$  (if  $n$  positive),  $\leq, <, \geq, >, (, ), [, ], \{, \}, \equiv, \in, \notin, \cap, \cup, \emptyset, \subset, \subseteq, \mathbb{Z}, \mathbb{Z}_n, \rightarrow$  (but only when dealing with functions:  $f: R \rightarrow S$ )

**Forbidden Symbols:**  $a|b, \div, \forall, \exists, \Rightarrow, \Leftrightarrow, \Leftarrow, \therefore, \because, \ni, \text{s. t.}, a/b, \frac{a}{b}, \&$

**Tentative Schedule:**

Week 1	Jan 10	introduction, 1.1, 1.2
Week 2	Jan 17	1.2
Week 3	Jan 24	1.3, 2.1
Week 4	Jan 31	2.2, 2.3
Week 5	Feb 7	review, 3.1
Week 6	Feb 14	Test 1, 3.2
Week 7	Feb 21	3.2, 3.3
Week 8	Feb 28	4.1, 4.2
Week 9	Mar 6	Spring Break – no class
Week 10	Mar 13	4.3
Week 11	Mar 20	4.4, review
Week 12	Mar 27	Test 2, 5.1
Week 13	April 3	5.2, 5.3
Week 14	April 10	6.1, 6.2
Week 15	April 17	6.3, review
Week 16	April 24	Test 3
Week 17	May 1	review for final exam
Week 18	May 8	Final Exam