

# Math 3163: Introduction to Modern Abstract Algebra

Section 002, Fret 405, TR 3:30 – 4:45pm

Instructor: Sarah Birdsong

Email: [sjbirdso@uncc.edu](mailto:sjbirdso@uncc.edu)

Office: Fretwell 345C

Phone: (704) 995-4715

Office Phone: (704) 687-4907

Office Hours: Tuesday 10:30am – 12pm, Thursday 11am – 12:30pm, & by appointment

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

**Text:** Abstract Algebra – an Introduction, 2<sup>nd</sup> or 3<sup>rd</sup> Edition, Thomas W. Hungerford

**Prerequisite:** Math 1242 and Math 2164 with a grade of C or better or by permission of the department. Additional recommended courses: Math 1165 and Math 2241 with a grade of C or better.

**Grading Scheme:** There will be 3 chapter tests during the semester and a cumulative final exam (Thursday, May 9, 2 – 4:30pm). Homework will be given throughout the semester on Thursdays (either as questions from the textbook or from a typed sheet).

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

**Topics/Objectives:** This course will cover chapters 1 – 6 in the textbook. We will look at examples and elementary properties of basic algebraic structures, especially rings and groups. 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 writing course, most homework and test questions will entail you proving a given statement by use of definitions, theorems, and logic. As this is a *writing intensive* course, all proofs will be required to be written in complete sentences, using full words (no abbreviations allowed) and correct grammar. Each proof needs to have a clear beginning, middle, and end. The beginning must clearly state any given information that will be used. Typically, the beginning is where you restate the “if” part of the statement you are asked to prove as well as to state any pertinent definitions. The end must clearly state the conclusion of the proof. Typically, this is where you restate the “then” part of the statement you are asked to prove. The middle of the proof contains all of the steps that link the beginning to the end. Every step of the proof must be written down and be justified by referencing something known (ie: a definition, theorem, lemma, etc). However, you may only use definitions, theorems, lemmas, etc. which have been discussed or proven in class. If you use a theorem or lemma not discussed or proven in class, it must be proven before you can use it.

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. See the next pages for more details on formatting and proof structure.

**Acceptable Symbols:** =, ≠, +, −, ·, ×, ⊕, ⊗, ⊙,  $a^n$  (if  $n$  is positive), ≤, <, ≥, >, (, ), [ ], { }, ≡, ∈, ∉, ∩, ∪, ∅, ⊂, ⊆, ℤ, ℤ <sub>$n$</sub> , → (but only when dealing with functions:  $f: R \rightarrow S$ )

**Forbidden Symbols:**  $a|b$ , ÷, ∀, ∃, ⇒, ⇔, ⇐, ∴, ∵, ∃, s. t.,  $a/b$ ,  $\frac{a}{b}$ , &

**Tentative Schedule:**

Week 1	Jan 10	introduction, 1.1
Week 2	Jan 15, 17	1.2
Week 3	Jan 22, 24	1.2, 1.3
Week 4	Jan 29, 31	2.1, 2.2
Week 5	Feb 5, 7	2.3, 3.1
Week 6	Feb 12, 14	review, Test 1
Week 7	Feb 19, 21	3.2
Week 8	Feb 26, 28	3.3, 4.1
Week 9	Mar 5, 7	Spring Break – no class
Week 10	Mar 12, 14	4.2, 4.3
Week 11	Mar 19, 21	4.3, 4.4
Week 12	Mar 26, 28	review, Test 2
Week 13	April 2, 4	5.1, 5.2
Week 14	April 9, 11	5.3, 6.1
Week 15	April 16, 18	6.2, 6.3
Week 16	April 23, 25	review, Test 3
Week 17	May 1	Reading Day
Week 18	May 9	Final Exam (2 – 4:30pm)