

Mathematics 216.03  
Introduction to Abstract Mathematics  
Spring, 2012  
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Carney 204A, MWF 2–3

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Office Hours: Monday, Wednesday, and Friday, 1–2; Wednesday, 3–5; Friday, 4–5; and by appointment

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Class home page: <http://fmwww.bc.edu/gross/MT216>

Texts: *A Concrete Introduction to Higher Algebra*, by Lindsay Childs, Springer Verlag; and *Abstract Algebra: Theory and Applications*, by Thomas W. Judson, available as a PDF file.

The goal of this course is to teach you how to read and write mathematical proofs. We will explore the language, structures, and concepts of abstract mathematics, and lay the foundations for the study of abstract algebra and real analysis. Topics will include:

- Properties of the Integers
  - Induction
  - Binomial Coefficients
  - The Euclidean Algorithm
  - Unique Prime Factorization
- Introduction to complex numbers
- Polynomials over a field
- Equivalence Relations and Partitions
- Sets, Functions and Cardinality
- Groups and Permutations
- Other topics as time permits

### Academic Integrity

You may discuss ideas when working on homework assignments, but you should write up your solutions individually. Sharing inspiration is good; copying someone else's work is plagiarism. Any violations of the College's policy on academic integrity will be dealt with severely. For more information, see

<http://www.bc.edu/catalog/univ/meta-elements/ssi/integrity.shtml>

### Homework

Homework will be assigned and collected frequently. If you wish to turn in any homework longer than one page, **you must use a stapler or paper clip**. Folding the edges of the pages over is unacceptable.

All homework submitted in this class must be typeset in some way. Microsoft Office, Open Office, or similar word processors are acceptable, but not the best way to type mathematics.

I strongly suggest that you install some version of  $\text{\LaTeX}$  on your computer and learn how to use it.

Macintosh users can download  $\text{\MacTeX}$  at <http://www.tug.org/mactex>. Windows users can download  $\text{\MikTeX}$  at <http://miktex.org>. There is plentiful documentation included in either of those downloads, but it is buried deep in various folders. One helpful guide is *The Not So Short Introduction to  $\text{\LaTeX} 2_{\epsilon}$* , available at <http://tobi.oetiker.ch/lshort/lshort.pdf>. The Wikipedia entry for  $\text{\LaTeX}$  has links to many other introductory articles, including an excellent Wikibook at <http://en.wikibooks.org/wiki/LaTeX>. An interface called LyX is available at <http://www.lyx.org>.

As you prepare your solutions, I suggest that you store a copy on MyFiles, and also mail a copy to yourself every time you made any changes. Flash drives have been known to fail, and hard drives, particularly on laptops, are also less reliable than you might think.

### **Examinations**

There will be three examinations during the semester, tentatively scheduled for Friday, February 17; Wednesday, March 28; and Monday, April 30. The final examination for MT216.03 is scheduled for Friday, May 11, at 12:30 PM. Note that this time is fixed by the Registrar, and cannot be altered.

### **Grades**

Homework will account for 20% of your grade. The three examinations during the semester account for 13%, 15%, and 17% respectively. The final will account for the remainder of your grade.