

## FOUNDATIONS OF ADVANCED MATH 1:00PM MWF SPRING 2006 HH 207

- Instructor: Jonathan White
- E-Mail: JWhite@Coe.Edu
- Web Page: <http://www.coe.edu/~jwhite/>
- Office: Hickok 206A
- Office Hours: 9:00-9:50am MWF, 2:00-2:50pm MW, and by appointment
- Office Phone: 399-8280
- Home Phone: 841-5111 (between 7am and 10pm)
- Text: *Sets, Functions, and Logic: An Introduction to Abstract Mathematics*, 3<sup>rd</sup> ed., Devlin
- Problem Sets: There will be several problem sets during the semester. Together these will be worth 200 points (25% of the final grade)
- Daily Work & Presentations: Day-to-day class participation and presentations will be a prominent aspect of this class, and together will be worth 200 points (25% of the final grade)
- Exams: There will be four small in-class exams administered during class time. The dates of these are indicated in the schedule on the back side of this sheet. These exams will be worth 50 points (6.25% of the final grade) each.
- The final exam will be held during finals week at the date and time indicated on the back side of this sheet. The final will be worth 200 points (25% of the final grade).
- Grading: Grading will approximately follow a 90% A, 80% B, 70% C, 60% D scale.
- Makeups: Late work of any sort will generally not be accepted, and if accepted due to extenuating circumstances will generally be subject to a penalty of 20% of the possible points for each day past due.

This class is intended to achieve several goals, but primary among them is to give some accurate idea of what mathematics actually is. The specific content of the course is secondary, but my hope is to give a good exposure to many topics which are helpful or necessary to further study in mathematics and related fields. These include, but are not limited to, the basics of set theory, functions, logic, and combinatorics.

This course will be profoundly different, both in subject matter and in daily conduct, than what most of you are accustomed to in a math class. Don't let that be overwhelming, and remember that I'm around to help.

## Tentative Schedule

Monday, January 16 <sup>th</sup> §1.1 - §1.5	Wednesday, January 18 <sup>th</sup> §2.1 The Language of Math	Friday, January 20 <sup>th</sup> §2.2 Truth and Implication
Monday, January 23 <sup>rd</sup> §2.3 Quantification	Wednesday, January 25 <sup>th</sup> §2.4 More on Quantification	Friday, January 27 <sup>th</sup> §2.5 Proof Techniques
Monday, January 30 <sup>th</sup> §2.6 The Integers	Wednesday, February 1 <sup>st</sup> §2.7 Mathematical Truth	Friday, February 3 <sup>rd</sup> <b>Examlet 1</b>
Monday, February 6 <sup>th</sup> §3.1 Sets	Wednesday, February 8 <sup>th</sup> §3.2 Operations on Sets	Friday, February 10 <sup>th</sup> §3.3 Real Intervals
Monday, February 13 <sup>th</sup> §3.4 Absolute Values	Wednesday, February 15 <sup>th</sup> §3.5 Inequalities	Friday, February 17 <sup>th</sup> §3.6 Arbitrary $\cup$ and $\cap$
Monday, February 20 <sup>th</sup> §3.7 Cartesian Products	Wednesday, February 22 <sup>nd</sup> §3.8 History of Set Theory	Friday, February 24 <sup>th</sup> Examlet 2
Monday, February 27 <sup>th</sup> §4.1 Introduction to Functions	Wednesday, March 1 <sup>st</sup> §4.2 Examples of Functions	Friday, March 3 <sup>rd</sup> §4.3 History of Functions
Spring Break – No Classes		
Monday, March 13 <sup>th</sup> §4.4 Injectivity and Surjectivity	Wednesday, March 15 <sup>th</sup> §4.5 Composition and Inverses	Friday, March 17 <sup>th</sup> §4.6 Countability
Monday, March 20 <sup>th</sup> §4.7 Uncountability	Wednesday, March 22 <sup>nd</sup> The Continuum Hypothesis	Friday, March 24 <sup>th</sup> Examlet 3
Monday, March 27 <sup>th</sup> §5.1 Binary Relations	Wednesday, March 29 <sup>th</sup> §5.2 Properties of Relations	Friday, March 31 <sup>st</sup> §5.3 Relations as Sets
Monday, April 3 <sup>rd</sup> §5.4 Relations as Graphs	Wednesday, April 5 <sup>th</sup> Symposium – No Classes	Friday, April 7 <sup>th</sup> §5.5 Equivalence Relations
Monday, April 10 <sup>th</sup> §5.6 Functions as Relations	Wednesday, April 12 <sup>th</sup> §5.7 $\mathbb{R}$	Friday, April 14 <sup>th</sup> Examlet 4
Monday, April 17 <sup>th</sup> §5.8 Completeness	Wednesday, April 19 <sup>th</sup> §5.9 Sequences	Friday, April 21 <sup>st</sup> §5.9 Sequences
Monday, April 24 <sup>th</sup> Counting	Wednesday, April 26 <sup>th</sup> Counting	Friday, April 28 <sup>th</sup> Counting
Final Exam – 11am Wednesday, May 3 <sup>rd</sup>		

Any students with disabilities which might affect their performance in this class should contact me as soon as possible to arrange accommodations.

Coe's faculty has adopted an academic integrity policy. It is your responsibility to understand and follow it.

Diversity, in all its forms, is valuable.