

Math 300: Logic and the Foundations of Algebra (class 3116)

Meets: TuTh 4:30–5:45p in LD 229

Final Exam: Friday, December 14, 3:30–5:30p

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Office Hours: TuTh 2:00–3:30p, W10:30a – noon, or by appointment

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URL: <http://www.math.iupui.edu/~ccowen/Math300.html>

General Information and Goals

Mathematics is one of the outstanding intellectual achievements of the human mind in addition to being at the core of the educational systems everywhere in the world and having applications at the foundation of many parts of our society including in all the sciences. An important goal of the study of mathematics is to help people understand both the applications of mathematics and the important ideas that make up the subject while at the same time becoming aware of the place it has in our civilization. The study of mathematics encounters a transition leaving the mathematics of school and the beginning of college and moving into the mathematics of the advanced courses in the major and the forefront of research.

This course is aimed at helping you make that transition. One of the most important features of the transition is the change in emphasis from “what?” and “how?” to an emphasis on “why?” and deeper meanings. In school mathematics and calculus, being proficient in the operations and the applications of the ideas is often sufficient for success in the courses. In upper division mathematics, there is much more emphasis on understanding the concepts, learning why what is true is true, and on communicating the ideas of mathematics. This course is intended to prepare you for the expectations of these more advanced courses.

My goals for you in this course are

Short term goal: That you become proficient in the language of mathematics, as it is used both formally and informally.

Short term goal: That you develop your ability to read mathematics and learn from what you read.

Short term goal: That you develop your ability to write mathematics, especially the ability to create and clearly write proofs, which are the explanations of why things in mathematics are true.

Long term goal: That you develop and sustain an excitement about mathematics generally, especially the mathematics you need in your professional and personal life, and that you can and do communicate that excitement to others.

The texts for this course are:

- *Discourses on Algebra*, by Igor Shafarevich, Springer 2003
- *Bridge to Abstract Mathematics: Mathematical Proof and Structures*, by Ronald P. Morash, 2nd Edition, McGraw-Hill 1991

The first text listed above can be found at the bookstores at a cost of about \$40. The second book is out of print, but by arrangement with the author, the part of the book we will use is available as a “CoursePack” from Dollar Bill Copying in Ann Arbor, Michigan at a cost of \$36.04 plus shipping. You can order by phone (1-877-738-9200 tollfree) or online at

<http://www.dollarbillcopying.com/SearchResult.aspx?CategoryID=55>

and the material will be sent to you directly. In addition, both books may be ordered online from internet booksellers. The Morash book is on reserve in University Library.

During the course, I expect that we will cover much of the first six chapters of the Shafarevich book and much of the material in the part of the Morash book included in the coursepack.

Attendance, Homework, and Quizzes

To quote from my colleague, Professor Morton: “Attendance is required to do well in this class. Based on experience, we can say with a fair degree of certainty, that if you do not come to class, you will not pass the course. Learning mathematics requires steady and persistent effort. Coming to class and making an effort to focus on the material being discussed is half the battle. The other half is practicing the concepts by doing the homework.” Missing a single class is missing half of a week of material!

It is important to read the texts, both before and after coming to class. Reading before will prepare you for the discussion in class and reading after will help solidify your understanding. Reading mathematics books is a skill that will take time to master, but will pay off in your later study both in other math classes and also in any classes that depend on reading detail. One of the biggest differences between reading mathematics and other kinds of reading is that to be successful in reading mathematics, you must read slowly and pay attention to the details you are reading. You will have frequent reading assignments. If you have trouble with material from the textbooks, please ask me about it in class or office hours.

Homework will be assigned and collected regularly, and will be graded both by Jim Carter, the graduate assistant for the course, and by me. Make-up/late homework will **not** be graded for credit.

Quizzes, often based on the homework, will be announced in advance and will be the done the last few minutes of the class. No make-up/late quizzes will be graded for credit; the two lowest quiz grades will be dropped, with missed quizzes counted as zeros.

The developing schedule for the course will be announced in class, but will also be on the website for the class, updated regularly.

Test, Exam, and Grading Policies

In addition to the Final Exam on December 14, there will be three tests during the semester. Each test will contribute about 20% of the grade, the homework and quizzes, together, will contribute about 15 – 20% of the grade, and the final exam grade will constitute the remaining 20 – 25% of the course grade.

These policies will apply for all tests and quizzes in the course.

- No calculators, cell phones, pagers, *ipods*, or other electronic devices are permitted to be on during the tests.
- No notes, books, or other of your papers may be used during the tests.
- The only items permitted on your desk during the test are the test paper, scratch paper provided by the instructor, and pen, pencil, and eraser.
- If a you MUST miss a scheduled test or exam, you should talk with me before the test or exam so that an alternate test can be scheduled. For unexpected emergencies, you should notify me as soon as possible by calling my office phone and leaving a message or sending email so that appropriate arrangements can be made.

The work you submit for homework, quizzes, tests, and the final exam must be your own. For homework you will probably find it beneficial to consult with other students about the material and this kind of conversation and collaboration is encouraged. At the end of the consultation, however, each participant is expected to prepare their own summary of the discussion and their own solutions to the problems. More information about student conduct can be found at

<http://registrar.iupui.edu/misconduct.html>

More information concerning adaptive services for learning or other disabilities at IUPUI can be found at

<http://life.iupui.edu/aes/>

The policies for this class will be those derived from IUPUI's policies on academic conduct and adaptive services.

Some Important Dates

Date

Late Sept	Test I
Oct 16	Last day to withdraw with automatic "W"
Late Oct	Test II
Nov 13	Last day to withdraw with permission of advisor and instructor
Mid Nov	Test III
Nov 22	Thanksgiving Day (no class!!!)
Dec 14	Final Exam, 3:30–5:30p