Math 276: Discrete Mathematics (Class No: 20898)

Meets: MW 6:00–7:15p in LD 002
Final Exam: Wednesday, April 30, 5:45–7:45p

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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. Mathematics is a very broad subject and continually changing, facts that are not always evident from the perspective of mathematics in grades K-12. Mathematics can be divided into two broad categories: discrete and continuous. The study of the integers and algebra are usually in the discrete category, while the real numbers, calculus, and geometry are usually in the continuous category. Historically, these topics, as you have studied them, are all rather old, the newest of them being 150 years to 300 years old. The topics of this class, which form part of the transition of moving from the mathematics of school into the mathematics of the advanced courses in the major and the forefront of research, are much newer, a few of these ideas even come from the second half of the 20th century.

Another aspect of the ideas of this course being considered modern is that a few decades ago, this material was not thought of as central to mathematics, while this course provides an introduction to ideas that are now considered central to modern mathematics. Why??? Because of the invention (by mathematicians for the most part) and development (by mathematicians, engineers, and scientists, some of whom began to call themselves computer scientists) of the digital computer! The digital computer is, at the core, a discrete device, so it relies on ideas from discrete mathematics. Further, it is efficient at solving problems from discrete mathematics, thereby making it possible to solve problems that could have been formulated, but not solved, a hundred years ago.

One of the important differences between the things emphasized in this course, in contrast to what was emphasized (usually) in school mathematics, is our emphasis on "why?" and deeper meanings in contrast to an emphasis on "what?" and "how?" 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 this course and courses from 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.

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.

Long term goal: That you develop an appreciation for categories of mathematics that are new for you and an understanding that there are many other branches of mathematics that you still will not have heard about.

The text for this course is:

Discrete Mathematics, by Kenneth Rosen, 6th edition, McGraw-Hill, 2007.

This is a new edition of the text used last Spring. There are few major differences between the two editions, but many minor differences. There would be little lost in reading the related sections in an old edition instead of the current edition, although there is some rearrangement and renumbering of sections and chapters of the book. On the other hand, the many minor changes will largely affect the homework because the changes in the problems will make it important to compare the problems from an old edition to the problems in the new edition in order to do the assigned homework. It is expected that some edition of the text will be on reserve in the library, but it is not likely to be the current edition.

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 text, 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 textbook, please ask me about it in class or in office hours.

Homework will be assigned and collected regularly and at least some will be graded either by a grader or 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 (URL above), updated regularly.

Test, Exam, and Grading Policies

In addition to the Final Exam on April 30, 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

January 21	Martin Luther King, Jr. Day, no classes
Mid February	Test I
February 29	Last day to withdraw with automatic "W"
March 10–16	Spring Break!! no classes
Mid March	Test II
March 28	Last day to withdraw with permission of advisor and instructor
Early April	Test III
April 30	Final Exam, 5:45–7:45p