MATH 117 Section 1
Why Mathematics?  
Fall 2007

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Office hours*: 3-4 MW; 2-3 TuTh; 9-10 F  
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*While these are the official office hours, I am available at other times as well. If you want to meet at a time outside of office hours, the best option is to set up an appointment with me. You can also just drop by any time, but you may want to call first to see if I’m there.  
†You can also instant message me on AOL at JonathanCox1975. (Disclaimer: I am not at my computer 24 hours a day!)

READ THE TEXTBOOK!

Other materials. A basic calculator might come in handy. A manipulative kit should have been packaged with your textbook.

Prerequisites. An open and curious mind and the willingness to put aside any preconceived prejudices or dislikes for mathematics. Very little mathematical background will be expected, although the catalog says N.Y.S. Algebra II and Trigonometry (or Math B), or equivalent, are assumed.

Catalog Description. Introduces the liberal arts student to the nature of mathematics and what mathematicians do. An emphasis on presenting ideas and mathematical concepts rather than on attaining computational skills. Ideas from algebra, geometry, number theory, set theory and topology are presented with emphasis on their history and relevance to other disciplines.

This course, amazingly enough, satisfies part of the Natural Sciences requirement of the College Core Curriculum.

Course objectives. Here we will consider some of the greatest ideas of humankind—ideas comparable to works of Shakespeare, Plato, and Michelangelo. The great ideas we will explore here are within the realm of mathematics. What is mathematics? Mathematics is an artistic endeavor which requires both imagination and creativity. In this course, we will experience what mathematics is all about by delving into some beautiful and intriguing issues. The three basic goals for this course are (1) To attain a better understanding of some rich mathematical ideas, (2) To build sharper skills for analyzing life issues that transcend mathematics, and (3) To develop a new perspective and outlook on the world.
**Content and Methodology.** I’ve picked out a few sections from the text that we’ll definitely cover. (These are already listed on the daily schedule.) The remainder of the semester’s content will be determined by a student vote—I will give you a list of topics and ask you to rank the ones that seem most interesting. Sometimes I will lecture, although I hope the lecture will be quite interactive. We will regularly do activities in class, often in groups. Students are encouraged to ask questions and make relevant comments anytime during class. Although we will follow the textbook fairly closely, not all the material in the text will be presented in class, while some material not in the text may be included in class. Thus it would be prudent to attend class, take notes, and review them as you have opportunity. And it is *essential* that you READ THE TEXTBOOK.

**Homework and other Assignments.** Homework will be assigned, collected, and graded regularly. While I will provide as much feedback as possible, only selected problems will be graded in detail. On the other problems you will receive full credit if you have completed them and appear to have some idea what you are doing.

On the homework, *clarity of exposition is important*, and one should strive for *well-written, polished solutions*. (This will be a factor in the grading!) All of your work for a given assignment must be handed in at the same time and preferably stapled together. See the section “Academic Integrity Policy and Honor Pledge” below for vital information about completing the homework.

Do the homework! How well you do in the class is directly related to how much homework you do. If you don’t do the homework, you probably won’t pass. It is also to your advantage to ask questions about homework problems that give you difficulty. Regular reading assignments from the text will also be given. In this course, possibly unlike previous math courses you have taken, it is *essential* that you READ THE TEXTBOOK.

Additionally, projects and other special assignments will be collected and graded. In particular, you will do a research project on a mathematical topic of your choosing (outside of those covered in class). The only way to really understand mathematics is to learn and discover it yourselves, which is what you will do by investigating your topic for this project. Students are strongly encouraged to work together in groups of two or three on this project. By working together, individuals can learn from each other and share the experience. Each group will write a final paper on their findings and present them at the end of the semester. Also, each student will write a short individual statement regarding the experience. Various interim reports will be collected throughout the term. Students are invited and encouraged to discuss all phases of the project with me.

For all assignments, due dates will be specified, and no late work will receive full credit, except in the case of an excused absence on the due date. (See the Attendance Policy section below.) I define work to be late if it is handed in after the beginning of the class period following the due date. Late work can still be handed in and graded, but will receive credit for only 50% of the points earned. However, no late work may be handed in after the last day of class or more than one month after the original due date.
Is it a quiz? Is it a test? No, it’s a QUEST! We will not have anything officially called an “exam” in this course, but we will regularly have quizzes. The quizzes can vary in length anywhere from five minutes up to potentially the entire class period, so we will call these objects quests to indicate that they fall somewhere on the spectrum between a quiz and a test. I will indicate the approximate length of each quest in advance.

The purpose of the quests is to determine your level of mastery of the concepts of the course. Their primary focus is to probe your ability to think, although there will certainly be some items involving computation or recollection of facts. They can include material not only from the homework, but also from the lectures, discussions, activities, and textbook, so that once again it is critical to attend class and to READ THE TEXTBOOK.

The final examination slot for this course is from 8:30am-10:30am on Friday, December 21. A cumulative final exam will not be given in this course. We may or may not have a quest that day, but if we do it will be relatively short. Most of that time slot will be used for presentations of your research project results. ALL STUDENTS ARE REQUIRED TO ATTEND THIS PRESENTATION SESSION or risk loss of substantial credit on the research project grade.

Make-up quests may be given in serious and unavoidable circumstances (as judged by the instructor), or in the event of an excused absence, and only if your request to make up the quest is approved by the instructor in advance or as soon as reasonably possible. Make-up quests should be taken within two class periods following the day of the quest if at all possible. (If you expect to have an excused absence, see me about taking the quest early.)

Grading and Evaluation. Performance in this course will be evaluated on a percentage system. The quests will constitute 60% of the final grade, homework will account for 20% of the grade, and all projects and other special assignments will be lumped into a category making up the remaining 20% of the grade. At the end of the course, your cumulative average (AVE) will be computed as follows.

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P = \text{Project average} \\
H = \text{Homework average} \\
Q = \text{Quest average} \\
AVE = .2P + .2H + .6Q
\]

I will also update your averages regularly and make them available on ANGEL.

Letter grades will be assigned as follows based on a student’s final percentage:

- 93 and above=A; 90-92=A–; 87-89=B+; 83-86=B; 80-82=B–;
- 77-79=C+; 73-76=C; 70-72=C–; 67-69=D+; 63-66=D; 60-62=D–; below 60=F

The instructor reserves the right to lower the grade ranges. The grade ranges will not be raised.

Attendance Policy. We will follow the SUNY Fredonia attendance policy. (See p. 219 and p. 239 of the 2007–09 undergraduate catalog.) Attendance is not officially a part of the grade in this course. However, you probably won’t be able to pass the course if you do not attend regularly. The in-class discussions and activities are an essential part of the “Why Mathematics?” experience. If you must be absent, please notify the instructor ahead of time. For informational purposes, an attendance sheet will be passed around each time the class meets. **It is your responsibility to sign this sheet** each period in order for your attendance to be official.

Work missed during an absence can be made up if the absence is determined by the instructor to be an excused absence. Your absence will be excused if you are participating in a university-sponsored program, exercising religious beliefs, hospitalized, or attending the funeral of a relative. Other absences due to unavoidable circumstances may also be excused at the
discretion of the instructor. Appropriate documentation for an excused absence should be provided to the instructor within three days of returning to classes.

Special Accommodations. “It is the responsibility of students with disabilities to identify themselves by notifying the Coordinator of Disability Support Services for Students.... For specific information about services and facilities for students with disabilities, students should contact: Adam Hino, coordinator of Disability Support Services for Students, Reed Library (fourth floor), by telephone at (716) 673-3270, by TTY at (716) 673-4763, or by email at disability.services@fredonia.edu” (p. 217, 2007–09 SUNY Fredonia Catalog). See also www.fredonia.edu/tlc/DSS/dss.htm.

Withdrawal Policy. The drop and withdrawal policy for this course will be that of the University. (See p. 218 and p. 223 of the 2007–09 SUNY Fredonia Catalog.) IT IS YOUR RESPONSIBILITY TO KNOW AND COMPLY WITH ALL DEADLINES. The last day to DROP this course is Friday, August 31. The last day to WITHDRAW from this course is Friday, November 2. The last day to completely withdraw from the university is Monday, November 26.

Academic Integrity Policy and Honor Pledge. Each student will sign a pledge to “support and abide by all provisions of the ... Academic Integrity Policy” (pp. 236-239 in the 2007–09 SUNY Fredonia Catalog or pp. 212–215 in the 2005–2007 Catalog) before any of his or her work is graded. While we will follow this policy, more details are given below regarding what behavior is or is not allowed in this class. Please ask me whenever it is unclear whether something is or is not allowed.

You are encouraged to work together on homework and in learning the material, and collaborators should be acknowledged. While working with another person or in study groups is permitted, all written work submitted for individual assignments must be your own. The principle here is simple: Under no circumstances and in no way should you ever copy any part of anyone else’s work and present it as your own. Here are some examples: 1) If you discuss hand-in homework with a group before doing it, afterward go off and write up the solutions yourself. 2) If you compare solutions with a friend and have different answers, neither should correct his solution using the other’s. You can try to figure out who went wrong where, and then go off and rework the problem on your own. (It should be noted that, for some problems, different correct solutions exist!) 3) If you are working on a research project and find some information the internet, do not “cut and paste” from the web page to your research paper and claim the selected material as your original work. Instead, blend the relevant information together with information from other sources using your own thoughts and words. You must cite and include a reference for any material that comes directly from another source. This list is meant to be illustrative, not exhaustive. Further elaboration will be provided in class as needed. In cases where work appears to be copied, I will invite the students involved to my office to explain the relevant material to me. A student who cannot explain his or her work adequately or who fails to present an explanation will lose points or receive a grade of zero on the assignment in question. The point is, in order to be successful in learning to think mathematically and in preparing for the quests, you need to try to work out homework problems yourself as much as possible. Otherwise you are cheating yourself.

Daily schedule. A tentative (and at this point partial) daily schedule for this course is available online at http://www.fredonia.edu/faculty/math/JonathanCox/whymath/sch117f07.pdf.

Any changes to this syllabus will be communicated in class by the instructor.