

Math 441 Topology Syllabus, Fall 2004

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Office hours: M 1-2pm and Wed. 10-11pm, or by appointment

We will use the textbook *Topology* by Munkres (Prentice Hall, 2nd Edition).

Grade, exams and homework. There will be two in class exams (midterm exam) each lasting 80 minutes. The first exam will be on Wed. Sept 29 and the second will be on Wed. Nov. 17. Homework will be assigned each week and will not be collected. There will be quizzes every week. The course grade will be based on the following:

Final Grade = 40% final + 20% first midterm + 20% second midterm + 20% quizzes.

Course material. We will mainly cover the point set topology this semester. The basic concepts to be introduced are: metric spaces and topology spaces, open and closed sets, continuity of functions, connectedness and compactness of topological space. We will also prove the Urysohn metrization theorem, Tychonoff theorem on product of compact spaces and Ascoli theorem. All these topics are in part I of the textbook.

More precisely, the following topics will be covered in the course.

1. A review of set theory. A review of basic topics in set theory (chapter 1, sections 1-7, 9,10).
2. Topological space. Definition of topology, examples of topological spaces, closed sets and limit points, and continuous functions (chapter 2).
3. Connectedness and compactness. Connected spaces and compact spaces, examples in the real line. Tychonoff theorem (chapter 3 and chapter 5, section 37)
4. Countability and separation axioms. Definition of the countability axioms and the separation axioms and Urysohn metrization theorem (chapter 4, sections 30-34)
5. Complete metric spaces and function spaces. Completeness, pointwise and uniform convergences and Ascoli theorem (chapter 7, sections 43,45,46,47)
6. Fundamental group and homotopy. (chapter 9). Most probably this material will not be covered in the first semester due to the time constraint.