MA3205: Set Theory
Semester 1, 2008/2009

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Office hours for Weeks 1-2:
Wednesday 1:00-3:00
(TBD for the rest of the semester)

Semi-official course description

This is an introductory mathematical course in set theory. There are two main objectives. The first is for the student to learn about abstract concepts such as cardinal and ordinal numbers, the Axiom of Choice, and transfinite recursion. The second is for the student to understand set theory in a larger context; that is, why it is often viewed as the foundation of mathematics. This module is designed for students who are interested in mathematical logic, the foundations of mathematics, and set theory itself.

Major topics: Algebra of sets. Functions and relations. Infinite sets. Induction and definition by recursion. Countable and uncountable sets. Linear orderings. Well orderings and ordinals. The Axiom of Choice. ZFC.

Texts and resources

The primary text for this course is Frank Stephan's online set theory text, available at http://www.comp.nus.edu.sg/~fstephan/settheory.html. I have also placed a copy of Karel Hrbacek and Thomas Jech's *Introduction to Set Theory* on reserve in the Science Library. While all the material can be found in Stephan's book, I will occasionally recommend that you read particular chapters of Hrbacek and Jech's.

Grading scheme

- One final exam (November 29, 1:00 p.m.), worth 65%.
- Two midterms, each worth 15%, for a total of 30%.
- Three homework problems (explained below), each worth 1%, for a total of 3%.
- Active participation in tutorials, worth 2%.

Each week, when exercises for the tutorials are handed out, some of them will be starred (*). Each student must submit a solution to one starred problem assigned before the first midterm, one assigned between the first and second midterms, and one assigned after the second midterm. These solutions must be carefully written up and submitted by the tutorials for which they have been assigned. The tutorial problems that you turn in must be written up independently. That is, you may talk about them with your classmates, but you must write your solutions by yourself

without looking at anyone else's. When you submit your solution, you must also submit the names of the people you discussed the problem with.

The other problems will not be graded. If you wish to know whether your solutions are correct, you are welcome to submit them to me.

The midterm exams will be given in class on September 11 and October 23.

Classroom policies

Please do not use electronics (hand phone, tape recorder, etc.) in the classroom without permission.

Thoughts

Mathematics is not a spectator sport. If you simply listen to the lecture and read the texts but do not try the problems yourself, you will not understand the material as well and will almost certainly be at a disadvantage on the exams.

Any changes to this document will be announced on IVLE and in class.