Outline for Math 454/504
Mathematical Logic
Fall 2006

Meetings: TTH 01:10–02:25 in SH 109

Instructor: Guram Bezhanishvili

Office Hours: TTH 11:45–01:00

Office: WH 203

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Prerequisite: C or better in Math 330 or Math 331, or consent of instructor.


Objectives: The main objective of Math 454/504 is to give a detailed account of the syntax and semantics of first-order logic. We will cover completeness, Loewenheim-Skolem, and compactness theorems of first-order logic. We will also study first-order theories. Special attention will be paid to the first-order theory of arithmetic, known as Peano’s Arithmetic, which we will study from the original historical source by Giuseppe Peano (1858—1932).

Material: We cover portions of Part A, which consists of the first eight chapters of the text. For the most part, these will be covered in the order they appear. Additional material will be covered as time permits.

Grades:

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Homework: Homework will be assigned routinely and a sample of exercises will be collected periodically for grading. To succeed in this course, daily work on practice problems must be done. Practice will build the required critical thinking and problem solving skills required on the exams. A student who can complete all homework problems will have a good grasp of the course material, and many of the questions on the exams will be of a similar nature to those assigned as homework. You are welcome to discuss the homework problems with other members of the
class, and you may hand in your solutions in pairs (i.e. one submission bearing two names). Homework must be written up in a comprehensible way. I will not accept late assignments without a medical certificate or other university approved excuse within a reasonable time of the missed work.

**Project:** We will pay special attention to the first-order theory of arithmetic, known as Peano’s Arithmetic, which we will study from the original historical source by Giuseppe Peano (1858—1932). I will assign the project in the second half of the semester. As soon as we start the project, I will decrease the amount of homework considerably. Most work turned in during this time will be parts of the project. Again, you are welcome to discuss the project with other members of the class, and you may hand in your solutions in pairs (i.e. one submission bearing two names).

**Midterm:** The midterm exam will roughly consist of 5 to 6 problems, and will cover material from the first half of the semester. It will be given sometime in October.

**Cumulative Final Exam:** The final exam for Math 454/504 will take place on Tuesday December 12th, 01:00 – 03:00 in SH 109.

**Missed Test Policy:** Students must notify the instructor before an exam is missed in order to qualify for a make-up exam. Failure to do so will result in a “0” for any missed exam. The only valid excuses for missing an exam are documented illness, death in the family, or required participation in any university related function. Supporting documentation is required.

**Withdrawals and Incompletes:** You have the primary responsibility for withdrawing from the course. The last date to drop with a “W” is Tuesday, October 17th. Under University policy, an I grade is allowed only if a student has passed the first half of the course, and is precluded from completion of the second half of the course by a documented illness or family crisis.

**Policies:** Students are expected to attend every class and show up on time. I also expect students to write clear prose and show some mathematical maturity in the work they turn in.

**Important Notes:**

- At the end of the final examination, the course is over, and there are no more opportunities to submit additional work.
- I will not compose extra credit assignments for students who want to try to compensate for poor results in another component of the course.
- Feel free to ask questions in class.

**Disabilities:** If you have or believe you have a disability, you may wish to self-identify. You can do so by providing documentation to the Services for Students with Disabilities (SSD) office in Corbett Center Room 244 at 646-6840. Appropriate accommodations may then be provided for you. If you are already registered with the SSD office, please make sure that I have received a copy of your “Accommodations Memo” from the SSD within the first two weeks. It is your responsibility to inform your SSD representative or me if the services or accommodations provided are not meeting your needs.