

Prof. Schimmerling
Math 21-300
Fall, 2019
MWF 2:30 – 3:20
Wean Hall 5415

Main topics

Basic background: set theoretic notation, induction and recursion, finite, countable and uncountable sets, equivalence relations and partitions. Propositional logic: syntax and semantics, truth tables, deduction systems, and the completeness and compactness theorems. First-order logic: syntax and semantics, deduction systems, Gödel's completeness theorem. Model theory: compactness theorem, upward and downward Löwenheim-Skolem theorems, universal theories, chains of structures, ultraproducts, dense linear orderings, non-standard models of arithmetic and analysis. Selected connections with computer science, algebra, combinatorics, analysis.

Prerequisites

21-373 or 15-251 or 21-228 or permission of the instructor

Course webpage

<http://www.math.cmu.edu/~eschimme/300Documents/contents.html>

The first link is to an online textbook written by Prof. Schimmerling

We plan to cover Chapters 1, 2, 3 and 4.

Homework

20% of the course grade will be based on homework. Most weeks, homework will be assigned on Monday and due the following Monday, but holidays and exam dates will require adjustments some weeks. Late homework will not be accepted. To solve all the exercises and submit solutions that are correct and well-written, students should begin work the day an assignment is announced. Students are expected to ask the professor for help on exercises that they are unable to solve after thinking seriously about them for two or three days. The professor will discuss advice and rules about collaboration.

Examinations

There will be two in-class midterm exams, each worth 25% of the course grade. The first exam will be on Friday, October 11. Tentatively, it will be on Chapters 1 and 2, and Sections 3.1, 3.2, 3.3 and 3.4 of Chapter 3. The exact material to be tested will be announced a week or two before the exam. The date for the second exam will be decided and announced later. There will be a three-hour final exam worth 30% of the course grade to be scheduled by the University. Each exam will have its own curve to be determined soon after the exams are graded and announced soon thereafter. Typically, for each exam, at least 20% of the students get A's, at least 50% get A's or B's, and at least 75% get A's, B's or C's. The grading is generous while the material is intended to be interesting and challenging.

Important

Do not schedule anything that might conflict with an exam without asking for and receiving prior permission from your professor. This includes job or internship interviews, team or club activities, flights home or elsewhere to visit family or friends, conferences, reunions, etc. Ask as far in advance as possible. We will be very strict in this regard.

On the other hand, for real emergencies, do the right thing, even if it means missing class or an exam. Later, as soon as it is reasonable, get in touch with the professor by email, or ask someone else to contact him.

In general, if you would benefit from any sort of accommodation, please ask so that we can do our best to help. Even if you are not sure whether the request is reasonable or possible, it doesn't hurt to ask.

Grading errors

Should you feel a grading mistake has been made, write a brief note on a fresh sheet of paper, staple it to your exam or assignment, and hand the packet to the professor in person. The note can be as simple as "Please look at my solution to problem 5 again, I think it is correct." Another example: "The points are added incorrectly." You have very limited time to do this, as will be explained in class.

Office hours

These will be set after consultation with students at the first few lectures.

Contact

Prof. Ernest Schimmerling
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Feel free to ask mathematical questions by email too. If it is difficult for either of us to explain in writing, we would set up a meeting.