

PMath 911 Topics in Logic: Stability Theory
Term Projects
Winter 2013, Rahim Moosa

Each of you will be asked to give a 25 minute (plus five minutes for questions) oral presentation on some topic of your choice, but relevant to the course material and discussed with me in advance. The projects will not include any written component. The presentations will be held on **April 9 and 10, 1:30–4:30 in MC 5045**. Attendance is compulsory, unless you have a final exam on April 11th.

In choosing a topic remember that the presentations are short and hence the scope should be very restricted. There are, roughly speaking, two ways to proceed:

- I. Focus on proving a Theorem. Choose a theorem not done in class, explain and motivate the statement of the theorem, and give as complete a proof of it as you can in the allotted time. You will most likely have to decide on what is the most important part of the proof to present, leaving other parts as black boxes, stated clearly but left unproved.
- II. Focus on explaining a Concept. Choose a notion/idea/concept not covered in class and develop it. There should be some substance, maybe a nontrivial example that needs to be worked out, or a theorem about the concept that needs to be proved.

While combinations of these approaches are possible, remember that time is limited.

You are welcome to come up with your own topic, and you are welcome to discuss it with me in person. But here are a few possibilities (with some starting references from Marker's "Model Theory: An Introduction" and Hodges' "Model Theory"):

1. Interpretability, quotients, and M^{eq} . (§1.3 of Marker.)
2. Elimination of imaginaries. (§4.4 of Hodges.)
3. Prime models. (§4.2 and §6.4 of Marker.)
4. The "never exactly two countable models" theorem. (§4.4 of Marker)
5. Indiscernibles. (Chapter 5 of Marker.)
6. Morely's Uncountable Categoricity Theorem. (§6.1 of Marker.)
7. Zilber's Indecomposability Theorem. (§7.3 of Marker.)
8. Fraissé constructions. (§7.1 of Hodges.)
9. Zilber's Group Configuration Theorem. (§4.8 of Hodges.)
10. Model theory of modules. (§A.1 of Hodges.)
11. Simple Theories. (This is a generalisation of stable theories, Frank Wagner wrote a book by this name.)

The shortness of the presentation does not mean that it is easy to prepare. You need to understand a lot more than you say, and this will take significant time and effort on your part. Start early.

By **Thursday March 7th** I would like you to submit to me a brief proposal, as part of Homework 3. By **Thursday March 21st** I would like you to submit to me a more detailed outline of what you intend to talk about, as part of Homework 3. Preparing these materials, together with my feedback on them, will help you focus your plans.