SYLLABUS AND LIST OF ORAL EXAM QUESTIONS

Please find below:

- The syllabus (a.k.a. "pensum") for the course "Introduction to Mathematical Logic" (Spring 2012).
- The official list of exam questions.

Exam format:

We will try to have as many people as possible take the exam on June 22, which is the official exam date for the course. It may be necessary that some take the exam on June 25; those who have already contacted me, stating a preference for either date, will have priority to get a spot on their preferred date. In principle, no one can refuse to take the exam on June 22, as this is the official exam date, but in practice we will try to accommodate you as best we can.

The exam is a 30 minute oral exam, following the usual format: You draw a question, then you are given preparation time, and then you come in and you begin presenting something about your questions. After a while, the examiner (i.e., Asger Törnquist) and censor will start asking questions.

In practice, to allow time for you to draw a question, and time for us to decide on a grade at the end of the exam, etc., the exam will last around 25 minutes; whence, the actual preparation time will also be around 25 minutes.

Syllabus:

The following pages from the textbook A mathematical introduction to logic (Herbert Enderton, Academic Press, 2001) form the syllabus for the oral final exam, together with the notes posted on the course web-page. The exercises are not part of the syllabus, but keep in mind that the exercises are a useful source of examples and additional information.

- pp. 67–104.
- pp. 109–120 (until the start of the subsection "Strategy".)
- pp. 131–142 (until, but not including, the "Enumerability Theorem".) The proof of the Completeness Theorem is *not* part of the syllabus, but the statement (and consequences) of the Completeness theorem is.
- pp. 155–156 (starting from the subsection Theories, and up to, but not including, Theorem 26H).
- pp. 182–187.
- pp. 202–223
- pp. 224–234, with the following stipulation: The only proofs you are required to know of from section 3.4 are items 1 and 2 on p. 226-227. You are *only* required to

know the *results* and *not the proofs*, starting with item 3, p. 227, and ending on p. 234.

- pp. 234–236.
- The following notes posted on the course web-page: iml-1.pdf (notes and exercises for week 1), iml-3.pdf (notes and exercises for week 3), and iml-recursivefcn.pdf (containing "my" definition of recursive functions.)

List of oral exam questions:

The following is the official list of oral exam questions.

- (1) First order languages, terms and formulas.
- (2) Truth (satisfaction), models (structures), and logical implication.
- (3) Definability in a structure, and definable classes of structures.
- (4) Homomorphisms, substructures, embeddings, and elementary equivalence.
- (5) Formal deduction, the axiom system of deduction (including tautologies and substitution.)
- (6) Metatheorems of deduction.
- (7) Soundness, completeness and compactness.
- (8) The theory A_E and the model \mathfrak{N} .
- (9) Representable relations and numeralwise determined formulas.
- (10) Recursive functions and representable functions.