Study guide Diophantine Equations

In this document we describe what you are expected to study. In general we do not expect you to be able to reproduce proofs, except when stated otherwise. What is important is that you know the statements of the various theorems indicated below and that you know how to use them. Furthermore we expect that you at least know how to solve the exercises you were asked to do during the exercise classes and the home work assignments. (Solutions for the home work exercises are available).

- The notes on algebraic curves, Section 1, Section 2,3 only Bezout's inequalities (Theorem 2.5, 3.2), Theorem 4.1 and computation of singular points, Section 5, Proposition 5.1 and 5.2, Section 7, Theorem 7.1.
- The notes on algebraic number theory, Sections 1.1 and 1.2.
- Notes on Diophantine equations. Sections 2.1 and 2.2. Of the latter you do not have to remember the statements of the Propositions, but we do expect that you understand the ideas which are behind the solutions of the specific cases. Sections 3.1, 3.2 (Skolem), 3.3 (rational approximation) and 3.4 (Siegel Lemma).
- Notes on Siegel-Mahler theorem. Sections 4.1 and 4.2. In the latter you are expected to understand how to go from a hyperelliptic equation or Thue equation to a three term S-unit equation.
- Notes on p-adic numbers, Sections 1,2,3,7. The most important thing is that you know what p-adic numbers are and that you are able to do simple computations with them. From Section 7, You have to know the theorems but not the proofs.
- Notes on linear forms in logarithms, Sections 1,2. You must be able to give some simple applications like the ones given in the text and execises, or variations on them. You don't have to know the proof of Theorem 2.3.
- Notes on the Subspace Theorem, Sections 1,3. You must be able to give simple applications like the ones given in the text and exercises, or variations on them. From Section 3 you must know what norm form equations are and that there are cases where they have infinitely many solutions. You don't have to know the proofs.
- Notes on the p-adic Subspace Theorem, Sections 1,2. You must be able to give some simple applications like the ones given in the text and the exercises. You have to know Theorem 2.3, and you must be able to apply it but you don't have to know its proof.