About the written exam.

The written exam should test whether the learning goals of the course have been attained. Please look at
`http://www.math.chalmers.se/Math/Grundutb/GU/MMA421/mma421.pdf`
to see what they are, if you have not already done so.

The exam consists of problems related to these learning goals. Some of the problems are more theoretical (like "State and prove a theorem that ...") and some are more computational (like "Find all the fixed points to the system ...", or "assume that ... then prove that ..."). At least one theory question will concern the statement and/or proof of one of the theorems/lemmas/definitions in the list below, but that list is not exclusive.

LIST OF THEOREMS

N.B. This list refers to Teschl's book as of January 1, 2011. If you have a different edition, check carefully that the numbering of pages, theorems et.c. has not changed.

- The contraction principle (Theorem 2.1 in Teschl), and the related definitons
- Theorem 2.2 (Picard-Lindelöf), and the related definitons (*e.g. Lipschitz continuity*)
- The Gronwall inequality (Lemma 2.7)
- Theorem 2.8
- The definition of extensions of solutions and Lemma 2.13
- Theorem 2.16
- Definition of stability and Theorem 3.4, Corollary 3.5
- Theorem 3.8
- Definition of flow, and Theorem 6.1
- The definitions in Chapter 6.3: orbit, stationary point (and the synonyms), periodic points, invariant sets, $\omega_{\pm}$-limit sets
- Lemma 6.4, 6.5, 6.6, you should know these well enough to be able to prove variations of the Lemmas
- Theorem 6.11, and Lemma 6.9, 6.10
- The definitions in Chapter 9.1, 9.2. You should be able to use Theorem 9.1, 9.2.
- The definition of stable and unstable manifolds (in ch. 9.2)
- Theorem 9.4, Theorem 9.10 (I will not ask for the full proof of these)
- Definition of conjugacy for maps (p. 232 in Teschl)