

List of topics for Exam #1

Topics: The list of topics for Exam #1 includes everything from the beginning of the course up to the lecture of Wednesday 10/11 (included). However, the focus of the test will be on binary structures.

Section 0: Sets and Relations

You should review all Section 0, at the very least go through the lecture notes very carefully and make sure that you understand everything.

Chapter 1: Groups and subgroups

Review all covered sections of Chapter 1 in depth:

- > Functions. Injectivity, surjectivity, bijectivity. Inverse functions, identity functions.
- > Complex numbers. Polar representation. Unit complex numbers and roots of unity.
- > Binary operation. Magma. Associativity, Commutativity. Closed (stable) subset, induced operation, submagma. Examples.
- > Idempotent elements, Identity elements, Inverses.
- > Monoid.
- > Homomorphisms, isomorphisms and structural properties.

Review material:

- > **Lecture notes** and supporting **textbook**.
- > **Homework exercises:** refer to the online course schedule for the homework assignments corresponding to the topics in the list of topics.
- > **Quizzes:** Quizzes 1, 2, 2 Make-up, 3, 4. Refer to the online course schedule for the quizzes.

General advice

- Your lecture notes from class should be your primary source of information. You are expected to know all the material in your lecture notes, and no other. Review your lecture notes regularly and thoroughly.
- Remember that all past quizzes, tests and homework exercises are available on the course web page. Make sure you go over all of them (or as many as you can).
- It is of the utmost importance that you work hard on your homework problems: do as many exercises as possible, and as seriously as possible. Just finding the correct answer is not sufficient: you need to understand why it is correct and you need to be able to write the proper justifications.
- I am happy to answer your questions, as long as: 1. They are mathematical questions, and 2. You have made a genuine effort to think about your question before contacting me.
- The best way to prepare for the exams is to work regularly: make sure you understand all the material as it is being taught, do many homework exercises, etc. Don't wait until the last moment to prepare. Don't try to guess what will be on the test, your time is best spent preparing for every possibility.
- Do not expect the test to be solely a direct application of the material you reviewed. It will require you to be capable of original thinking.
- Calculators will not be allowed, nor any other resources.