
MEGR 3122: Exam 1 Study Guide

Format

- Date: Check the front page of Canvas for Exam dates
- Location/Time: In class from 2:30pm to 3:45pm
- Total time: 75 minutes. We will begin promptly at 2:30pm, please arrive early.
- No graphing/smart calculators allowed (only basic calculator without programming capabilities)
- Bring only a pencil/eraser and blank paper. For extra space you can write on back side of exam pages or on your extra blank paper that you must hand in with your exam.
- Formula sheet will be provided (see example posted online)
- The exam is closed book/closed notes
- The exam consists of 11 multiple choice problems (2 points each). Total exam is 20 points, therefore one problem is treated as a bonus.
- You *must* show work next to MC for full credit, see below:
 - Correct answers with no work/justification given may receive zero credit or partial credit if the question is such that a reasonable student would need to work out the solution on paper to arrive at the solution (i.e., if the problem is not easily solved by visual inspection). In other words, guessing an answer correctly without any reasoning may not earn any credit.
 - Incorrect answers with work may receive partial credit (where applicable) if a correct reasoning and work demonstrates understanding of concepts.
- Multiple choice questions may include symbolic expressions, numerical expressions, or conceptual text-based responses

Content

The exam is based on lectures L1-L10 and homework H1-H4.

- L1: Introduction to System Dynamics
- L2: Terminology/Review Of Ordinary Differential Equations (ODEs)
- L3: 1st Order ODEs
- L4: 2nd Order ODEs
- L5: Complex Arithmetic
- L6: Laplace Transforms
- L7: Additional Laplace Transform Properties
- L8: Inverse Laplace Transform
- L9: Solving ODEs with the Laplace Transform
- L10: MATLAB tools for ODEs

Study Checklist

The items below are general suggestions which you might consider to help prepare for the exam. Students that can confidently check all these boxes should do very well on the exam.

- ☐ I have reviewed the lecture notes carefully (multiple times if needed!). I am confident in all of the concepts and notation. Remember, you are responsible for **all** material in the lecture notes and the purposes of the in-person lectures is to review the main points from these notes.
- ☐ For concepts that were most difficult I have consulted other resources such as the textbooks listed in the syllabus and/or other online texts/videos such that I am now confident in them.

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- ☐ I have gone through the practice exams.
 - ☐ I have visited office hours and/or asked the TAs/instructors questions online for any lingering questions that I couldn't resolve while studying.
 - ☐ I have reviewed all my submitted homework and quizzes and compared my answers to the solutions. If there are problems that were incorrect: I know where I went wrong and can now easily re-do the homework examples without looking at the solution. (Note: If you get stuck on a specific question while practicing please carefully review the concept you missed that prevented you from progressing in the question. Also, the solutions may have an alternative approach to solving the problem even if you received full credit—please review them carefully.)
 - ☐ I have reviewed all of the example problems in the lecture notes. I can easily re-do them without looking at the solutions.
 - ☐ I have reviewed the formula sheet. I understand which equations are relevant to this exam, what all the symbols mean, and when/how to use these equations appropriately.

Practice Problems

For each lecture you will find a collection of between 2–6 problems across the homework, lecture notes, and any quizzes. There are also practice problems in the old exams posted. Beyond these, I do not have additional practice problems to provide students at this time. However, you can access additional practice problems by consulting the textbooks listed in the syllabus and the sections within these textbooks referenced at the end of each lecture. Additionally, you may be able to independently identify other practice problems available through various online resources.

Study Groups

Students are encouraged to form study groups with their peers to discuss past problems and concepts.