ECE 486 Fall 2022, ZJUI: Term Test II

The following information is a guideline in preparing for Term Test II.

Time and place. Term Test II will be held on Thu, Dec 07, in class (13:05h–14:05h).
Please be seated by 1300h. Students who are late will NOT be given extra time

Topics covered. The exam will cover everything up to and including Lecture 19 on Nov 24. Here is a list of specific topics:

- Root locus (RL): definition of the RL, Evans' rule
- PID design and lead/lag design using the root locus.
- Frequency domain basics: Bode plots, Nyquist plots, how to sketch them, how to relate them for a given transfer function.
- Bode's gain-phase relationship.
- Frequency domain design: Crossover frequency; bandwidth; phase and gain margins; PD/lead and PI/lag compensation; choosing lead/lag parameters to satisfy given specs (bandwidth, PM/GM, steady state tracking errors).
- The Nyquist Stability Criterion: N = Z-P; reading stability ranges given the Nyquist plot and knowledge of open-loop poles and zeros.
- Reading stability margins (PM and GM) off a Nyquist plot.

What to bring. The exam is closed-book, closed-notes. You may bring TWO sheets of notes (both double-sided) with any necessary formulas. You can bring a simple, non-graphic calculator. Other electronic devices are not allowed.

What to expect. Complete all questions in the given time. Show your approach clearly as you are not merely graded based on final answers but also the steps you took. You are not allowed to communicate with anyone during the quiz except for the invigilators. Do not start writing unless instructed by the invigilator and stop writing when told to do so.

Tips for preparing. The primary goal of the quiz is to test your understanding of the main concepts, not memorization or computational skills. Make sure to follow up on all lecture material, readings, and homework problems and solutions. Come for consultation hours if you need help. Lastly, do not be too worried about the results. Treat this as a chance to gauge your level of understanding before moving on to more advanced concepts and eventually in preparing your final exam. 😊