ECE317

Midterm #1 Study Guide

- **This is an approximately 60 minute exam during the first part of the class on Oct. 31. Exam will start at 6:40pm.**
- **This is a multiple choice exam**
- **You are required to bring a Scantron Form No. 882-E to the exam, where you will record your answers. Use of No. 2 pencil is also recommended.** These are available from the PSU bookstore. You may want to bring an eraser as well.
- No calculators are permitted to be used
- Closed book/closed notes except for a one page ($8\frac{1}{2}" \times 11"$) formula sheet (written on both sides is OK)
- No spare (scratch) paper.
- I will provide a Laplace Transform table.

Main topics:

1) Application of Laplace transform

2) Block diagram reduction

3) Transient analysis:

   i) First order systems, time constant, settling time

   ii) Second order systems: types of responses, overdamped, critically damped, underdamped, undamped, damping factor, undamped natural frequency, settling time, %OS

4) Linearization of static nonlinearity (i.e. there are no derivatives)

5) Stability:
   i) Definitions of asymptotic and BIBO (bounded input, bounded output) stability
   ii) pole locations
   iii) stable/ marginally stable/ unstable

6) Labs:
   i) Lab content
   ii) PECS