EERI418 Semester test 1 study breakdown

March 10, 2017

1 Breakdown

Dorf and Bishop Chapter 11	What is important?
Section 11 .2	You have to know the definitions of controllability and observability and be able to calculate it. Study examples in the book and what we did in class. Also have a look at exercises at the back of Chapter 11.
Section 11 .2	Be able to design state variable feedback controllers using the pole-assignment technique. You need to be able to calculate the desired characteristic equation from given specifications. You must also be able to apply Ackermann's formula to determine $\mathbf{K}$. Ackermann's formula will not be given.
Section 11.4 and 11.5	I will not ask questions about observers in this test but will definitely in the Exam. You therefore do not have to study these sections for Friday.

Phillips Chapter 1	
Section 1.1 - 1.8	Study the section by concentrating on the process of modelling. I could ask you to derive a state space model or transfer function model of an electrical circuit. I also gave you some worked out problems from this section on Efundi. Study this as well.

Phillips Chapter 2	
Section 2.3	This is a very important section containing the definition of the z-transform. Do the examples and remember the identity $\frac{1}{1-x} = 1 + x^2 + x^3 + \ldots,\ |x| < 1$. Do some examples and exercises on calculating the z-transform from first principles.
Section 2.4	You need to be familiar with the properties of the z-transform and be able to apply them in deriving the z-transform of sequences. Study the examples carefully.
Section 2.5	Table 2-2 and Table 2-3 will be supplied in the test.
Section 2.6	You must be able to write and solve difference equations

Section 2.7	In order to solve difference equations the power series method and the partial-fraction expansion method are very important. Check notes in class and also the examples in the book.
Section 2.8	Be able to draw signal flow diagrams in the discrete domain. Be able to analyse these signal flow diagrams using Mason's rule
Section 2.9	Be able to derive discrete state space models. You must be able to derive a discrete state space model from a transfer function in the formats discussed in class, see slides as well. You should also be able to derive a discrete state space model from a transfer function.
Sections 2.10 -2.14	You can leave out.

Table 1: Study breakdown