EE 211 Section 1
Course Objectives – Chapters 6 and 7

Chapter 6

1. Be able to state the v-i relationships for capacitors and inductors.
2. Given v or i for a capacitor or inductor, be able to determine the other variable.
3. Be able to find the energy w for capacitors and inductors.
4. Be able to find the outputs from simple op-amp circuits using capacitors and inductors (such as integrators and differentiators).
5. Be able to find equivalent circuits for circuits using capacitors and inductors.

Chapter 7

1. Be able to define **state variable**.
2. Be able to find the **characteristic equations** for first and second order differential equations.
3. Be able to find initial conditions and final conditions using **DC analysis**.
4. Be able to find the **zero-input** responses of circuits with one capacitor or inductor – i.e., the responses with no input to the circuit.
5. Be able to find the **step responses** of circuits with one capacitor or inductor – i.e., the responses with a step input.

6. Be able to find the **sinusoidal responses** of circuits with one capacitor or inductor – i.e., the responses with a sinusoidal input.
7. Be able to decompose the step response and sinusoidal response into **zero input** response and **zero state** response.
8. Be able to decompose the step response and sinusoidal response into **natural** (or **transient**) response and **forced** (or **steady-state**) response.
9. Be able to find the zero-input and step responses of circuits with a capacitor and inductor in series.
10. Be able to find the zero-input and step responses of circuits with a capacitor and inductor in parallel.
11. Be able to find ω_0, the **undamped natural frequency**, and ζ, the **damping ratio**, for second-order constant-coefficient linear differential equations.
12. Be able to find the zero-input and step responses of second-order constant-coefficient linear differential equations.