ENEL220 Term 4 Checklist 2019

Chapter 15

By the end of the Chapter 15 notes you should be able to:

Resonance

- ☐ Derive the transfer function of a circuit.
- ☐ Draw pole-zero diagrams when given a transfer function, H(s), or a circuit.
- ☐ Calculate the key parameters (e.g. resonant frequency, exponential damping coefficient, natural resonant frequency, quality factor, bandwidth, component values) for a parallel or series resonant circuit.
- ☐ Calculate the magnitude and phase of a transfer function. This requires knowledge of polar and Cartesian coordinates.
- ☐ Calculate the magnitude and frequency scaling constants, K_m and K_f.

Bode

- ☐ Draw bode plots (magnitude and phase) given a transfer function.
- ☐ Draw bode plots for transfer functions that have complex conjugate pairs and understand the impact of the damping factor.
- ☐ Identify the transfer function of a system, given the Bode plots (i.e. system identification).
- ☐ Be able to identify parameter values from a Bode plot (e.g. resonant frequency, damping factor and bandwidth).

Filters

- ☐ Describe/ define the characteristics of low, high, bandpass and bandstop filters.
- ☐ Design passive filters with specific corner or cutoff frequencies.

Chapter 17

By the end of the Chapter 17 notes you should be able to:

- ☐ Determine the period and fundamental frequency of a signal from a sketch of the periodic waveform.
- ☐ Calculate the Trigonometric Fourier Series coefficients of a signal.
- ☐ Calculate the Complex Fourier Series coefficients of a signal.
- ☐ Calculate and draw the line and phase spectra (note that phase spectra will not be in the exam).
- ☐ Identify if a signal has even or odd symmetry.
- ☐ Calculate the Fourier Transform of a signal.
- ☐ Apply Fourier transform theory to find the output of a system with a given impulse response and input.

Exam Content

Remember you can look up old exams on the UC library website. These are a very good guide to the type of questions you are likely to get! Basic things to remember:

- ☐ Always show all working, even if you're doing something in your head, or if you think it's obvious (for example, write "by inspection"). This makes it easy for me to give you carried error marks if you make a silly mistake.
- ☐ Always put units on your answers!
- ☐ There is no shortage of paper in the exam, so spread your answers out. Start each new question on a new page. Use an entire page for each Bode plot.