Detailed Course Aims

1.   You should know the characteristics of an ideal op-amp.

2.   **You should know how to analyse** inverting amplifier configurations using an ideal op-amp.

3.   **You should be familiar** with the structure and analysis of the following applications of the inverting configuration: the "simple" amplifier, a summing amplifier, an integrator, a differentiator, a "simple lag" (or lowpass) circuit, a simple highpass circuit, a simple bandpass circuit.

4.   **You should know how to analyse** non-inverting amplifier configurations, and be familiar with the structure and analysis of a "simple" non-inverting buffer amplifier (i.e. be able to construct the "node equations" for an op-amp circuit).

5.   **You should know** the structure of a difference amplifier and a differential amplifier, and **know how to analyse** them. You should be familiar with the "balanced input" application of a differential amplifier (but you do not need to know about the so called "instrumentation amplifier" given in the notes).

6.   **You should be able to construct** Bode plots of simple frequency dependent circuits, including: simple lowpass, simple highpass, simple bandpass.

7.   **You should be able to interpret** the Bode plot of a resonant system, and **understand the significance** of the resonant frequency, the damping coefficient, the Q-factor, and the bandwidth of a resonant system, and **be able to relate** these to the 2nd order function in $j\omega$ (i.e. how to extract Q-factor etc from the 2nd order transfer function coefficients).