

ECE 401
Educational Objectives
Lab Practical Exam
Fall 2003

1. Be able to set the impedance state in the signal generator to *high Z* before generating any waveform.
2. Be able to generate a sine-wave, square-wave, and triangle-wave signal with any frequency and amplitude using the signal generator.
3. Be able to generate an AM signal with any carrier frequency, carrier amplitude, message frequency, and modulation index. Be able to set the message waveform of the AM signal to sine, square or triangle.
4. Be able to generate an FM signal with any carrier frequency, carrier amplitude, message frequency, and frequency deviation. Be able to set the message waveform of the FM signal to sine, square or triangle.
5. Be able to generate a binary FSK signal. Be able to set the two FSK frequencies and the FSK rate to any desired frequency.
6. Be able to successfully construct any circuit studied this semester. In particular be able to construct an envelope detector, RLC BPF, RC LPF, RC HPF, op-amp inverting amplifier, op-amp non-inverting amplifier, op-amp comparator, op-amp buffer, etc.
7. Know how to differentiate an FM signal to generate an AM signal using a HPF or BPF.
8. Be able to display signals on the oscilloscope and set the time and amplitude scales.
9. Be able to measure the peak-to-peak voltage, frequency, and period of a signal using the “Quick measure” button on the scope.
12. Be able to operate the “Math” button and use the FFT function to display the FFT of a signal. Be able to adjust the center frequency, span, and the sampling rate of the FFT displayed. Be able to turn on or off the input waveform when displaying the FFT or other processed waveform.
13. Be able to operate the “Cursor” button to make measurements.
14. Be able to adjust the display and triggering options on the oscilloscope.
15. Be able to set the correct Probe gain factor on each channel of the scope based on the probes used.
16. Be able to import screen captures into a Word document (you will be asked to create a Word document and submit it for your exam).

Make sure your account is set up to operate on the PCs in the lab and the acquisition software has been set up on **YOUR** account. Test it out **BEFORE** the exam period, as we will be limited to 35 minutes total for the lab practical exam.