Instructional Objectives for Roberts Chapter 14 –
Sampling and the Discrete Fourier Transform

14.1 Introduction and Goals

Describe why sampling is required when using digital computers.

14.2 Representing a Continuous-time Signal by Samples

State Shannon's sampling theorem.
Draw a block diagram that represents how impulse sampling is achieved.
Sketch the resulting frequency spectrum when an analog signal is subjected to impulse sampling.
Define *aliasing* and describe why it is detrimental.
Given an analog signal or spectrum, determine the Nyquist frequency and the Nyquist rate.

14.5 The Fast Fourier Transform

Describe the utility of the FFT.
Apply the FFT using MATLAB to determine frequency content of various waveforms.