**CSC 335 Data Communications and Network I**

**Homework 2**

1. (1 point) Why would you use UTP over STP? Why not?

You would use UTP over STP if you are looking for a relatively easy installation, low cost, and are not spanning a long distance with the cable (which would make it more susceptible to electromagnetic interference). However, you might want to use STP if you need extravagantly higher data transmission rates and are trying to span a long distance.

1. (1 point) A sinusoid signal has a frequency of 1200 Hz. What is the period?

The period is 1/1200 seconds.

1. (1 point) What is the bandwidth of a signal composed of frequencies ranging from 100 Hz to 4000 Hz?

The bandwidth of this signal is 3900 Hz.

1. (2 points) What is amplitude modulation? How is it different from frequency modulation?

Amplitude modulation uses a change in the amplitude in the signal to denote the difference between 1s and 0s, whereas frequency modulation alters the frequency of the signal to denote the difference between 1s and 0s.

1. (2 points) What is PCM? Where is it used?

PCM is pulse code modulation - the conversion of a quantized signal into bits. More specifically, the various forms of PCM, such as Antipodal NRZ or Manchester Encoding, are ways to intake information in the form of change in voltage (signal) and convert that information into 1s and 0s to be pieced back together to extract that actual desired information. PCM is used in ethernet as the method for transferring bits via a signal.