COMP3721 - Midterm Review

1. Data communications system, communications modes, type of networks, different topologies, and Internet.

2. Protocol layering and TCP/IP protocol suite, responsibilities of each layer, type of addressing, name of a packet at each layer, examples of protocols, etc.

3. Analog/digital data/signals, sine wave (T, f, phase, wavelength), Time-domain plot vs frequency domain plot, bandwidth of a composite signal, unit conversion.

4. Baseband transmission vs broadband transmission, computing attenuation/strength of a signal, distortion, noise, SNR and SNR in dB, Shannon capacity vs Nyquist data rate (**NOTE** the difference not only in the type of the channel but also in the formula itself, we have a factor of 2 in Nyquist but not in the Shannon formula).

5. Digital-to-digital conversion, line coding techniques and their characteristics (**no need** to memorize how each scheme does the encoding exactly), know how to detect existence of baseline wandering, synchronization, and DC components, difference between unipolar, polar, bipolar, etc. Name the techniques for each category.

6. Analog-to-digital conversion, PCM, quantization error and SNR, etc.

7. Digital-to-analog conversion (FSK, ASK, QAM, PSK) and constellation diagram.

8. Analog-to-analog conversion (AM, FM, PM).

9. **NOTE** the **differences** between the techniques in 7 and 8 above.

9. Multiplexing techniques (especially **synchronous TDM**).

10. You must know that with L signal levels, the number of bits per signal level is **$\log_2 L$**. Also, if there are n constellation points in a constellation diagram, then each point (i.e., signal element) represent **$\log_2 n$** bits.

11. ARP and its role