INFSCI1072/TELCOM 2700: Wireless Networks
Homework 3

Read the articles posted on the web page. Answer the following questions.

1. What is radio resource management? Why is it necessary in wireless systems?
2. What is mobility management? Why is it necessary in wireless systems?
3. Differentiate between a physical channel and a logical channel.
4. How is the 3G network architecture different from the 2G cellular network architecture? How is the 4G LTE network architecture different from the 3G cellular network architecture?
5. The channel bandwidth in LTE is different from the bandwidth occupied by the resource blocks. For each specified channel bandwidth, compute the fraction occupied by the physical resource blocks. Comment on the efficiency.
6. Differentiate between a basic service set and an extended service set in IEEE 802.11.
7. In Bluetooth, what differentiates a master device from a slave device? Can a device be a slave in two piconets? Can a device be a master in two piconets? Why?
8. Draw a diagram showing the sequence of UWB pulses transmitted using PPM for the sequence 00101101.
9. Plot the UWB pulse $v(t)$ given by the following equation for $A = 1$ and $\tau = 0.25, 0.5, 1$. Use Matlab or R. Show the three pulse shapes on the same plot and identify the values of τ. What do you conclude from the plot?

$$v(t) = 6A \sqrt{\frac{e\pi}{3}} \frac{t}{\tau} e^{-6\pi\left(\frac{t}{\tau}\right)^2}$$