

## **Matlab Assignment**

**(Due Monday Feb 13 at 24:00 email to Dan - help available next Monday)**

For the lab write-up using Word or whatever clearly state what tutorials you completed. For the 2nd question cut and paste your code into an email or save the file somewhere. Save images of your "waves" and put them in your lab write-up.

The write-up should have short sections like:

1. Title
2. Introduction
3. Results
4. Conclusion

But for this lab does not need to be very extensive as it is pretty trivial.

The email to dan should be **pdf** and the subject should say '1908 Assignment 1' .

### **What to do!**

1. Do some of the tutorials! Matrix math and plotting for sure.
2. Waves travel with both a wavelength and a frequency in time, these can be plotted in time steps to show a traveling wave - and can also be summed with other waves to create interesting standing waves and interference patterns.

The following steps will help to create and visualize traveling and standing waves.

- Create an array  $x$  of 100 points
- Iterate time for  $n$  time steps (for loop)
- Using  $y = A \sin(\beta x - \omega t)$ ,  $\beta = 2\pi/\lambda$  and  $\omega = 2\pi f$  with  $f$  being the frequency. Calculate  $y$  at each time step and plot using : `plot(x,y); pause(0.1);`
- Try different values of wavelength,  $\lambda$ , and frequency,  $f$ , and Amplitude.

- Create and plot a second wave traveling in the opposite direction
- Plot also the sum of both waves
- The second wave can have a different wavelength, frequency, Amplitude, and direction
- Use the help command for any axis or any other problems