| PHY1106: Waves and Oscillators | Dr. Pete Vukusic |

Lecture 15.

Lecture objectives.

- To be familiar with the principle of superposition; especially in mathematical form.

- To understand the formation of standing waves [formed from two counter-propagating travelling waves (equal amplitude and ω, equal-and-opposite k)].

- To appreciate that <u>normal modes</u> on a string are the stable states (eigenmodes). Familiarity with the mathematics of this is required.

Post-lecture tasks.

- Describe in words what is meant by an *antinode* on a stretched string. Explain how and why it is set up.
- Describe the mathematical relationship that predicts the positions of the nodes and antinodes on this string.
- A standing wave has a separation of 1 m between adjacent nodes. What is the wavelength, and wavenumbers of its constituent travelling waves?
- A violin string is plucked at its centre point so that at $t = 0$ it forms a triangular shape. Will the triangular shape be maintained (albeit with a different height of triangle) at subsequent times? Explain this (refer to hints in Young and look at http://www.kettering.edu/~drussell/Demos/string/Fixed.html .