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

Lecture 3.

Lecture objectives.

- To understand the kinetic energy and potential energy ideas associated with SHM.
- To derive the expression for total energy of SHM system, and to appreciate this is constant due to the absence of frictional forces and exchange between KE and PE.
- To have a overall understanding of SHM (undamped).
- To have an understanding of complex number representation, and to begin to apply this to SHM analysis.
- To understand the construction of an equation of (forces) motion for damped SHM.

Post-lecture tasks.

- Study carefully "Young, section 13-4, page 400-403, on Energy in SHM," as a reinforcement / addition to material covered in lectures.
- Read section 13-8, page 411-413, to prepare for forthcoming lectures on damped SHM.
- Revise and practice working with complex numbers (appropriate maths text!).
- Calculate the following;

    (2+3j).(1-2j)   (1-5j).(2-j)   (3-2j).(3+2j)

    Real part of $(2-3j)^2$ $\sqrt{j}$ (1+j)/j

- What is the (phase) angle between the following pairs of numbers?

    (1) and (-j)   (1+j) and (1-j)   (2-j) and (j+1)