Why study Classical Mechanics?

1) CM represents a complete physical theory which has greatly influenced the style of modern physics.
2) CM is required to understand quantum mechanics, field theory, statistical mechanics and elementary particles.
3) It led directly to microscopic models for the behavior of matter and these successes in turn yielded continuum mechanics and statistical mechanics. In contrast their failures led to quantum mechanics and relativity.
4) CM is widely used in many branches of current physics.
   a) Plasma physics
   b) Accelerator design
   c) Beam optics
   d) Space physics
   e) Chaos theory
   f) The study develops mathematical tools and skills that have broad applications in science and engineering
   g) Fluid mechanics
   h) Condensed matter physics

Physics 1 approaches review

Conservation Laws
Conservation of Linear Momentum
Conservation of Angular Momentum
Work-Energy Theorem
   Definition of Kinetic Energy
   Conservation of Energy
System of Particles
Center of Mass
Conservation of Linear Momentum – weak 3rd law
Conservation of Angular Momentum – strong 3rd law
   Can define relative to the center of mass as well as inertial points
   Separation of Relative and CM components
Work-Energy Theorem
   Separation of Kinetic Energy
   Conservation of Energy
Simple Pendulum – three approaches – can you name them?
   When need constraint forces require Newton’s law approach
   Can change co-ordinate axis but must be aware of time dependence in unit vectors if not Cartesian set.