PHY 3221 : Intermediate Mechanics, Spring 2002
Final Exam check list

- **Chapter 1** : Make sure that you know about vector calculus, differentiation and integration of vectors, different systems of coordinates (cartesian, spherical, cylindrical), at least to the extent that they have been used in class.
- **Chapter 2** : Applications of :
  - Newton's Laws;
  - conservation theorems (linear momentum, angular momentum, mechanical energy).
- **Chapter 3** :
  - general properties of the 1-dimensional free harmonic motion: force and potential energy, equation of motion and its solution, characteristics of the motion, total mechanical energy;
  - damped oscillations: equation of motion and possible solutions.
- **Chapter 5** :
  - how to calculate the gravitational potential and gravitational field of a given discrete or continuous mass distribution.
- **Chapter 8** :
  - motion of objects under the action of a central force, general properties;
  - equations of motion for a central force motion and their integration;
  - qualitative study of the motion through the effective potential;
  - integration of the motion through the energy expression;
  - two body problem and its solution;
  - case of the gravitational force: planetary motion.
- **Chapter 9** :
  - center of mass, linear momentum, angular momentum, and energy of a many constituent systems, both discrete and continuous;
  - equations of motion (both translational and rotational);
  - case of a rigid body rotating about a fixed axis;
  - elastic and inelastic collisions of two particles.