

PH-211

<http://www.physics.pdx.edu/~larosaa/Phy-221/Physics-221.html>

KINEMATICS , DYNAMICS, CONSERVATION LAWS (Motion) (Force) (Mechanical Energy Linear and angular momentum)

Summer-2009 (06/22 -07/13)
Room CH 250
MTWRF 11:45-14:05 PM
Office Hours: MTWRF 14:10-15:00 PM. (right outside the classroom)

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Text*: Fundamentals of Physics, by Halliday, Resnick and Walker, 8th Edition

Grading: **Exam-1** 35% June 29th, 2009
Exam-2 35% July 6th, 2009
Exam-3 35% July 6th, 2009 Comprehensive

Evaluation: A 100-96, A- 95-91, B+ 90-86, B 85-81, B- 80-76,
C+ 75-71, C 70-66, C- 65-61.

Students who typically do well in this course:

Have active participation in class. Ask questions during the lectures.
Solve a minimum of 20 question/problems of each chapter (from your textbook or the ones suggested during the lecture.)

Lecture Notes: Available on line
<http://www.physics.pdx.edu/~larosaa/Phy-221/Physics-221.html>

LECTURE NOTES

Outline

Chapter-1 [Measurements](#)
Complement notes: [Measurement and significant figures](#)

KINEMATICS

Chapter-2 [Motion in one dimension](#)
[Special case: Motion under constant acceleration](#)

Chapter-3 [Vectors](#)
Complement notes: [Vectors and transformation of coordinates](#)
Advance material: [Tensors](#) (This section about tensors will not be included in the tests)

Chapter-4 [Motion in two and three dimensions](#)

DYNAMICS

Chapter-5 Force and motion [Newton's Laws](#)

Chapter-6 Force and motion [Friction force](#)
[Uniform circular motion](#)
[Practice problems](#)

KINETIC ENERGY (K) and WORK (W)

Fundamental theorem $K_f - K_i = W_{\text{by all forces}}$

Chapter-7 [Kinetic energy and work](#)
[Work done by different types of forces](#)

CONSERVATION LAWS

Conservation of "**Mechanical Energy E**" (case of conservative forces)

Chapter-8 [Potential energy and the conservation of the mechanical energy](#)
[Examples about total work and the change in kinetic energy](#)

Conservation of "**Linear Momentum P**"

Chapter-9 [The Linear Momentum and the Center of Mass](#)
[Elastic and inelastic collisions](#)

Rotational motion

Chapter-10 [Rotation, torque, equilibrium condition for rotational motion](#)
[Rotational kinetic energy](#)

Conservation of "**Angular Momentum P**"

Chapter-11 [The Angular Momentum](#)
[Equation of motion for a rigid body](#)

FUNDAMENTAL FORCES

Chapter-13 Gravitation Force

*** Additional references**

- R. L. Reese "University Physics"; Brooks/Cole Publishing Company; QC21.5.R435 1998.** This reference provides very interesting complementary information for our course. This reference will be available in the Library Reserve Room.
- 2. Paul A. Tipler, "Physics" Volumes 1 and II, Fourth Edition; W. H. Freeman Publishers.** Reference does not spend too much time in the foundation; rather focuses more in the applications. A very practical reference. This book will be available in the Library Reserve Room.
- 3. R. Feynman, R. Leighton, M. Sands; "The Feynman Lectures On Physics"; Addison-Wesley; QC21.2.F49 1989.** This is an excellent reference, conveying a deeper understanding of physics concepts. Excellent reference to understand the foundations of physics.