

PH-211

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

Fall-2005

Room PCAT 160

Mon & Wed 16:40-18:30 PM

Office Hours: Fr 16:30-17:30 PM. (I also will stay in the classroom M & W:18:30-19:00)

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KINEMATICS , DYNAMICS, CONSERVATION LAWS **(Motion) (Force) (Mechanical Energy)**

Text*: Fundamentals of Physics: 7th Edition; by Halliday, Resnick and Walker

Grading: Homework #1 10% Due on Monday Oct 3rd, 2005.

Homework #2 10% Due Oct 26th

1st Exam 30% Monday Nov 7th

Homework #3 10% Due Nov 23rd

Final exam 40% Monday Dec 5th

Lecture Notes Available on line

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

Projects

This activity is optional.

Students will have the opportunity to prepare a 3-page long report on a topic of their own interest that intersects with PH-221.

You may also choose to put one Lecture Notes in a Power Point format.

The grade on the "Project Report" (up to a maximum of 3 points) will be added to the student's final grade (accumulated from exams and homework assignments).

(Reference #1 below offers in each chapter a series of topics for project.)

Project submission: Send electronic format to: andres@pdx.edu

Writing format guidelines: see information online (copy and paste fragments from website will not be allowed).

Due date: Any time before the midterm exam is optimal.

No project will be received after Nov 14.

Students who typically do well in this course:

Have active participation in class, asking questions during the lectures.

Solve a minimum of 20 questions/problems of each chapter (from your textbook or the ones suggested in the lecture notes.)

Syllabus updates Check updates at <http://www.physics.pdx.edu/~larosaa/>
Syllabus may be updated as the course progresses (the list below in tentative.)

Practice problems given below may also be updated.

Date Tentative Chapters Highlight topics

KINEMATICS

1	09/26 Ch-1 (1-7), Ch-2 (1-4) 09/28 Ch-2(5-7)	International System of Units MOTION IN <u>ONE</u> DIMENSION. (Special case: constant acceleration)
	Practice problems:	Ch-1: 1, 3, 5, 7, 10, 12, 16, 19, 23, 29, 40, 52. SP 1-4 (p. 7) Ch-2: Q1 to Q9; 3, 6, 11, 12, 13, 14, 17, 21, 31, 33, 35, 36, 38, 42, 43, 45 46, 48,54, 58, 60,). SP 2-1, 2-2.

Homework #1, due Monday Oct 03

2	10/03 Ch-2(8-10) 10/05 Ch-3 (1-4), Practice problems:	MOTION IN <u>ONE</u> DIMENSION (Objects in motion nearby the Earth's surface; acceleration= $g=9.81 \text{ m/s}^2$) VECTORS. Position & displacement, speed & velocity Ch-2: 61, 62, 65, 69, 78, 82, 88, 99, 115 Ch-3: Q2 to Q8, Q10; 4, 6, 8,15, 19, 20, 25, 26, 27, 35.
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3	10/10 Ch-3 (5-8) 10/12 Ch-4 (1-6) Practice problems:	MULTIPLYING VECTORS MOTION IN <u>TWO</u> DIMENSIONS. Relative motion Ch-3: 37, 39, 42, 43, 48, 59, 61, 66, 70, 71,74, Ch-4: Q1 to Q13; 1, 3, 6, 7, 9, 11, 15, 16, 17, 19, 20, 22, 23, 24, 28, 30, 31, 32, 33, 34, 35, 36, 38, 40, 43.
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4	10/17 Ch-4 (7-9) Practice problems	Relative motion Ch-4: 44, 46, 50, 51, 52, 55, 56, 58, 59, 60, 64, 68, 69, 70, 71, 72, 74, 75, 77, 78, 80, 85, 86, 96, 106, 111, 119, 123, 132.
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DYNAMICS

10/19 Ch-5 (1-6)	Force and Motion, NEWTON's 1 st and 2 nd LAWS Ch-5: Q1 to Q12; 1, 3, 4, 5, 8, 9, 11, 12, 13, 15, 16, 24, 26, 30, 37, 39, 40, 41, 42, 43, 44, 45, 47, 49, 50, 51, 52, 54.
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Homework #2, Due Oct 26th

5	10/24 Ch-5 (7-9) 10/26 Ch-6 (1-4) Practice problems	NEWTON's 3rd LAW, FREE BODY DIAGRAM FRICTION Ch-5: 55, 56, 60, 63, 66, 67, 70, 74, 75, 76, 77, 88, 99, 100. Ch-6: Q1 to Q11; 1, 4, 7, 8, 10, 12, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 26, 28, 29, 30, 32, 33
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6	10/31 Ch-6 (5) Practice problems Ch-7 (1-7)	UNIFORM CIRCULAR MOTION Ch-6: 36, 37, 41, 43, 47, 48, 49, 51, 52, 57, 58, 59, 61, 62, 66, 67, 68, 69, 71, 74, 82, 89, 90, 97, 102, 105 Concepts of WORK and KINETIC ENERGY
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Practice problems Ch-7: Q1 to Q10; 1, 3, 4, 9, 10, 12, 13, 14, 18, 20, 21, 27, 28, 31, 32, 37, 39.

CONSERVATION LAWS

11/02 Ch-7 (8-9), Ch-8(1-7) POTENTIAL ENERGY and CONSERVATION OF ENERGY

Practice problems Ch-7: 40, 41, 44, 47, 47, 50, 54, 55,57, 61, 63, 70, 71, 74, 78.
Ch-8: Q1 to Q9; 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 14, 15, 16, 18, 20, 21, 22, 23, 25, 27, 28, 29, 30, 31, 32,33, **34**, **36**, 37, 40, 41, 44, 45, 49, 50, 51, 51, 57, 59, 60, 61, 62, 63, 64, 66, 67, 71, 82, **89, 95**.

7 11/07 EXAM (Chapters 1-7)

11/09 Ch-9 (1-8) CONSERVATION OF LINEAR MOMENTUM

Practice problems Ch-9: Q1 to Q12; , 1, 3, 4, 5, 7, 8, 9, 10, 13, 15, 17, 20, 21, 23, 24, 25, 28, 29, 30, 31, 32, 33, 38, 42, 48, 49, 50, 53, 54, 56, 58, **60**, 62, 63, 64, 74.

Last day to turn in "Project Reports" Nov 14th (Optional Activity)

8 11/14 Ch-9 (8-11) ELASTIC and INELASTIC COLLISIONS

Practice problems Ch-9: 75, 76, 81, 82, 89, 97, 109, 113, 124, 126, 128, 130, 134.

11/16 Ch-10(1-10) ROTATIONAL MOTION

Practice problems Ch-10: Q1 to Q10; 1, 2, 7, 8, 13, 14, 18, 19, 22, **27**, 28, **29**, 34, 36, 38, 39, 40, 41, 47, **48**, 51, **52**, 53, 55, 56, 58, 59, 60, 62, 65, **67**, 69, 71, 72, 76, 77, 78, 81, 83, 84,**85**, 86, 88, 89, 90, 92, 94, **98**, 101, 104, 111, 116, 120.

Homework #3, Due Oct 23th

9 11/21 CH-11(1-5) ANGULAR MOMENTUM

11/23 Ch-11 (6-12) TORQUE

Practice problems Ch-11 Q1 to Q10; 1, 3, 4, 6,7, **8**, 9, 10, 11, 12, 13, 14, 24, 25, 28, 30, 31, 34, 36, 37, **38**, 39, 40, 41, 44, 45, 47, 50, 51, 53, **56**, **57**, 58, 59, 60, 64, 66, 69, 76, 83, **85**, 86, 88, 100.)

11/24-25 Thanksgiving, University Closed (our class on Wed. eve meets as scheduled).

10 11/28 Ch-12 (1-5) EQUILIBRIUM

Practice problems Ch-12 Q1 to Q10; 1, 2, 5, 7, 10, **13**, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 30, 31, 32, 34, 35, 36, 38, 39, 40, 41, 42, 43, 44, 45, 46, **47**, 48, 49, **50**, 52, 53, 54, 55, 57, **59**, **60**, 61, 62, 66, 67, 69, 73, 74, 75, **77**, 79, 80, **81**, 82.

11/30 Ch-13 (1-8) GRAVITATION

Practice problems **Ch-13** Q1 to Q10; 1, 2, 4, 6, 7, 8, 9, 10, 11, 12, 14, 15, 17, 20, 23, 28, 29, 31, 36, 48, 52, 58, 63, 72, 75, 79, 89, 94, 96, 97, 98, 102, 103.

12/5 Final Exam (Comprehensive) 17:30 PM - 19:20 PM.

*** Additional references**

- 1. R. L. Reese “University Physics”; Brooks/Cole Publishing Company; QC21.5.R435 1998.** This reference provides very interesting complementary information for our course. In addition, each chapter suggests topics for research projects. 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.