

PHY 2060 Enriched Physics I - Spring 2017

Periods 4 & 5

INSTRUCTOR: Prof John Yelton, NPB 2031, Tel. 352 392 8475, yelton@ufl.edu

OFFICE HOURS: MW period 8, NPB 2031, or by appointment.

OVERVIEW: PHY2060 is an introductory course in mechanics, covering aspects of kinematics and dynamics (both linear and rotational), conservation laws, harmonic motion, and special relativity.

COURSE MANAGEMENT: The course uses the CANVAS e-learning platform for grades, homework assignments and other announcements. Please log on to the site as soon as possible and make sure your settings are such that you will receive e-mail through the site ("inbox") and receive announcements in a timely manner. The e-learning site is lss.at.ufl.edu

MEETINGS: Tuesday, Thursday 10:40 pm - 12:35 am (periods 4+5), NPB 1002

TEXTBOOK: Resnick, Halliday, Krane: Physics, Volume 1 [5th Edition, Wiley, ISBN 978-0-471-32057-9].

This book is freely available second-hand. I strongly encourage students to check out the used book market rather than buying it new.

PHILOSOPHY OF COURSE: This is an old-fashioned course in that you are expected to attend class, do the homework, and give evidence of your knowledge by solving examination questions with hand-written answers with the possibility of partial credit. PHY2060 is one of several Physics I alternatives offered by the department; in particular covers similar ground to PHY 2048 (Physics with Calculus I), and satisfies any degree requirement that asks for PHY2048. Although there is no "PHY2060L", students usually take PHY2048L laboratory course at the same time as PHY2060. Comparisons between PHY2060 and PHY2048 include:

PHY2060 is open only to honors students and those showing a major interest in physics.

PHY2060 is taught in the small auditorium, with a typical enrollment of 30. PHY2048 is taught in large auditorium sections of around 300.

PHY2060 has a double lecture time, twice a week, rather than the 3 lectures, 1 discussion of PHY2048

PHY2060 has long-answer, partial credit exams. PHY2048 has multiple-choice exams

Although both courses have Calculus I as a pre-requisite and Calculus II as a co-requisite, PHY2060 uses calculus more extensively and expects a more mature understanding of calculus than PHY2048

All course labeled "Physics I" start at the beginning of physics.

However, realistically, it is tough to do PHY2060 without first doing high-school physics. Students with no background in the subject are usually wiser not to attempt PHY2060 as their first physics course.

In general, the level of the presentation of PHY2060 is higher than PHY2048, the questions more demanding, and the majority of the students better prepared. The grading scale takes this into account, and so a higher percentage of students get "A" grades in PHY2060 than in PHY2048.

PHY2060 includes sections on special relativity, a subject not included in PHY2048.

GRADES: Grading will be based on an absolute point scale from 0 to 100. The letter grade assignment will be based on the students total point score. Points will be assigned for homework (max 10 points), quizzes/additional assignments (max 9 points), and exams (max 81 points). The following is the guaranteed grading scale. That is, it is guaranteed not to be more stringent than this. Letter Grade Point Range:

This was modified 2/10/16

A > 78

A- > 73

B+ > 68

B > 63

B- > 58

C+ > 53

C > 48

HOMEWORK: Homework is assigned approximately weekly, and will be communicated in class and on the class web site. It is understood that students cooperate with each other and discuss how to approach the homework problems.

QUIZZES: There will be some quizzes, in class, during the semester. The material for each will be well publicized in advance. In addition there will be some non-standard homework assignments. The sum of these two constituents total 9% of the grade.

EXAMS: In addition to the final exam, two other in-class exams will be administered. These will cover significant chunks of the class material. Each exam will carry a maximum score of 100 points. Together, they account for 27% of the grade. "Bare bones" formulae will be given in the exam.

SCHEDULE OF LECTURES (tentative):

The schedule below lists the topics planned for each lecture, cross-referenced to the text, as well as the date of each exam. This schedule is likely to evolve!

1/5 First class: Motion in one dimension (Secs. 2-3 to 2-6)

1/7 Force and Newton's first and second laws (Secs. 3-2 to 3-5)

1/12 Relative Motion, Newton's second and third laws (Secs 3-5 to 3.8)

1/14 Projectile motion (Secs 4-3 and 4.4)

1/19 Uniform circular motion (Sec 4.5),

1/21 Examples of Tension, Normal forces and frictional forces (Secs 5-2, 5-3)

1/26 Uniform circular motion (Sec 5-4), Linear momentum and impulse (Secs 6-2, 6-3)

1/28 Conservation of Momentum, One dimensional collisions (Secs 6-4, 6-5)

2/2 Many-particle Systems (Secs 7-3, 7-4)

2/4 Many-particle Systems (Secs 7-5, 7-6)

EXAM 1 2/9 (Through chapter 7)

2/11 Rotational Kinematics (Secs 8-1 to 8-6)

2/16 Torque and Rotational Inertia (Secs 9-1 to 9-4)

2/18 Rotational Dynamics (Secs 9-5 to 9-8)

2/23 Conservation of Angular Momentum (Secs 10-1 to 10-5)

2/25 Work, Energy and Power (Secs 11-1 to 11-3), Work Done by a Variable Force (Sec 11-4)

SPRING BREAK

3/8 The Work-Energy Theorem (Secs 11-6 to 11-8)

3/10 Potential Energy (Secs 12-1 to 12-5)

3/15 Conservation of Energy (Secs 13-1 to 13-5)

3/17 Gravitation (Secs 14-2 to 14-7)

3/22 Superficial coverage of fluids (both static and in motion)

3/24 Simple Harmonic Oscillations (Secs 17-1 to 17-4)

EXAM 2 3/29 In class exam on Chapters 8 thru 14 (up through sec 14-7)

3/31 Harmonic Oscillators

4/5 Real Harmonic Oscillators

4/7 Speed of light and relativity (20-2)

4/12 Time Dilation, length contraction etc. (Sec 20-3)

4/14 The Lorentz Transformation (Sec 20-4)

4/19 Last Day of Class - Review for Final

Final Exam 4/29 10.00 a.m. Room 1002. Cumulative, with accent on sections after 14.

Further important information:

Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>.

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor.

Phone numbers and contact sites for university counseling

services and mental health

services:<http://www.counseling.ufl.edu/cwc/Default.aspx>; 392-1575, University Police Department 392-1111 or 9-1-1 for emergencies.