Course Syllabus: PHY 2060 - Enriched Physics 1 - Spring 2021

Instructor

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HyFlex Class meeting times

Tuesday, Periods 6 & 7 (12:50 pm - 2:45 pm)

- on-line students on Zoom
- face-to-face students in room NPB1001

Thursday, Periods 7 (1:55 pm - 2:45 pm)

- all students meet via Zoom on-line.

*** Essential information for our unique learning environment ***

- Zoom connection information is available in Canvas.
- Students registered for the face-to-face component of the course may choose to attend any of the Tuesday class meetings (except exams) either remotely via Zoom or in-person. If possible, when attending classes in person you are strongly encouraged to bring a charged device with you that is capable of connecting to Zoom in order to fully engage in activities with your online classmates.
- Students registered for the online-only component of the course should not be physically present in the classroom at any time during class meetings.
- All students must wear masks in classrooms. Accommodations will not be granted for disability-related requests to not wear a face covering. You must have your mask on when you enter the building, in accordance with University policy, and the mask must cover your mouth and nose at all times. Do not come to the classroom if you are feeling ill, if you have been asked to isolate or quarantine, or if you are not currently cleared for on-campus status via One.UF. Responsible distancing from others should be practiced at all times while in the classroom. Failure to abide by these policies may result in dismissal from the class session or the adjournment of the entire class for the day.

Office hours

Thursday, Period 8 (3:00 - 3:50 pm) using Zoom video conference tools.

Course objectives and goals

This is the first course in the Enriched Physics sequence PHY 2060-2061 for students with prior preparation in physics who wish to acquire a deeper understanding of the subject. The enriched sequence covers similar material to the Physics With Calculus sequence PHY 2048-2049, but treats basic topics at a faster pace, incorporates more advanced material, and places greater emphasis on instilling conceptual understanding and on developing the ability to solve more challenging problems. PHY 2060 treats concepts in classical mechanics, including kinematics, dynamics, conservation laws, oscillations, and special relativity.

On completion of this course, students should have a sound understanding of key concepts in classical mechanics and special relativity, be able to apply physics laws and principles to analyze scientific graphs and data, and to provide quantitative solutions to a wide range of physics problems.

Textbook

Resnick, Halliday, Krane: "Physics", Volume 1 [5th Edition, Wiley, ISBN 9780471320579]. Access to the material in the textbook is required. Homework assignments are based on problems in the textbook.

Prerequisites

PHY 2060 is not designed to be a first course in physics.

- You should have studied physics at the high-school level. Completion of an AP course is helpful but not essential. However, if you have had no physics in high school, you will be at a significant disadvantage.
- You need to be proficient at algebra, at geometry and trigonometry (see page A-20 of the textbook), and at performing elementary vector operations (see Sec. 2-2 of the textbook).
- You should have successfully completed MAC 2311 Calculus 1 or equivalent, and have taken or be currently be enrolled in MAC 2312 Calculus 2. The course will make extensive use of differentiation, and at several points during the semester you will be expected to complete problems involving integration. The section "Derivatives and Integrals" on page A-21 of the textbook contains a useful summary of the calculus results that you will need. If you are in doubt as to whether you should take PHY 2060 or one of the alternatives (such as PHY 2048), please consult the instructor immediately.

Course Structure

This is a HyFlex synchronous course: some students are attending class on line and some of the students are physically in the classroom. The course utilizes Canvas as an educational shell to organize and post course content, lectures, videos, assignments, to administer quizzes and post student grades. It is also used for announcements, e-mail communication with students as well as for student discussions. The course lectures are delivered live in class and on Zoom during the UF assigned meeting time (see Class meeting times above). This class is synchronous.

The course is organized in 15 weekly modules on Canvas. Each module consists of :

- **Tuesdays: two-hour meetings face-to-face and using Zoom video conferencing** . The meetings include lectures, discussions, work in small groups using breakout rooms (3 students per group). The live lectures will be recorded and posted for students to access at a later time;
- **Thursdays: one-hour meeting using Zoom video conferencing**. The Zoom meetings will be recorded and posted for students to access at a later time. All meetings are synchronous.
- Each lecture is preceded by a **reading assignment** listed in the "Class Schedule";
- The lecture material is followed by a **weekly homework assignment** submitted on Canvas through the "Assignment" tool (every Tuesday by 10 pm).
- The students are assessed by **two midterm exams** and **one final exam** administered online through the "Honorlock" tool (see the class schedule for exact exam dates).
- **Weekly Zoom Office Hour**: Thursday 8th period. Students are also encouraged to communicate by e-mail.

Separate modules on Canvas are dedicated to:

- **Homework solutions**
- **Exam solutions**

Graded material:

- Homework: due on Tuesday by 10 pm (see below for details)
- Exams: two midterm exams and a final exam (see below for derails)

The final grade is calculated as "Final Grade"= (75%"Exam Grade" + 25%"Homework Grade").

Reading assignments

You are expected to read the material to be covered in each lecture **before** coming to the class. The reading assignments are listed in the class schedule date-by-date. The lectures will cover a large fraction of the material listed in the schedule, but they are not designed to be a substitute for the textbook. The lectures will consist mainly of illustrating concepts with experiments and demonstrations (when possible), discussing additional material omitted in the text, pointing out subtle points and common mistakes, asking questions to find out and clarify misconceptions, and applying the learned concepts to solve problems. The homework and quizzes will be based on the material covered in lectures as well as those listed in the schedule.

Homework

Homework will be assigned weekly, and will be posted in the "Assignments" module on Canvas. The homework will be available on Tuesday and will be due the following **Tuesday by 10 pm**. You can submit your work as a file (text, image or pdf file) on Canvas. Cooperation on homework is permitted and discussion of problems among students is encouraged. The instructor will not solve homework problems until after the due date for the homework assignment. Each homework set carries a maximum score of 100 points. The final homework score is calculated as an average of all homework scores, dropping the two lowest homework scores. Therefore, there will be no extensions or makeup homework assignments. The only exception is long-term illness or hardship which will be reviewed on a case by case basis.

Exams

There will be two midterm exams and a final exam. The dates and chapters covered in the exams are on the class schedule in the syllabus. All exams are closed book and will be administered via Honorlock. Calculators are allowed provided that your calculator does not have internet access and cannot store pdf or other image files. A list with commonly used physics expressions will be provided by the instructor. If you miss an exam for a documented university sanctioned function or medical reasons there will be a makeup exam scheduled to fit both the instructor and your schedule.

Grading

Grading will be based on a scale from 0 to 100. The final grade is calculated as 75% exams and 25% homework. The conversion to letter grades will be done using the following conversion table after rounding the total number of points to zero decimal places.

A	≥ 85
A-	≥ 78
B+	≥ 71
B	≥ 65
B-	≥ 58
C+	≥ 51
C	≥ 45
C-	≥ 42
D+	≥ 38
D	≥ 35
D-	≥ 30
E	< 30

Course schedule (tentative)

The schedule below lists the topics planned for each lecture, pointing to chapters in the textbook. This schedule is likely to evolve. Changes will be announced on Canvas as well as during class time. Please check you UF e-mail regularly for changes and class announcements. It is your responsibility to be aware of changes posted on Canvas or sent by e-mail.

Lecture #	Date	Topics
1	1/12	First class: Dimensional analysis, motion in one dimension (Review Chapter 1 and Chapter 2)
2	1/14	Force and Newton's laws (Secs. 3-2 to 3-8)
3	1/19	Reference frames and relative motion (Secs 3-2, 4-6) Projectile motion (Secs. 4-1, 4-3)
4	1/21	Projectile motion (Secs 4-3 and 4-4), Uniform circular motion (Sec 4.5)
5	1/26	Uniform circular motion (Sec 4-5),
6	1/28	Tension, normal forces and frictional forces (Secs 5-2, 5-3)
7	2/02	Uniform circular motion (Sec 5-4), Linear momentum and impulse (Secs 6-2, 6-3)
8	2/04	Conservation of Momentum, One dimensional collisions (Secs 6-4, 6-5)
9	2/09	Many-particle Systems (Secs 7-3, 7-6)
10	2/11	Review Chapters 1-7
Exam 1	2/16	Midterm Exam on Chapters 1 to 7
11	2/18	Rotational Kinematics (Secs 8-1 to 8-6)
12	2/23	Torque and Rotational Inertia (Secs 9-1 to 9-4)
No Class	2/25	Recharge day
13	3/02	Rotational Dynamics (Secs 9-5 to 9-8)
14	3/04	Conservation of Angular Momentum (Secs 10-1 to 10-5)
15	3/9	Work, Energy and Power (Secs 11-1 to 11-3) Work Done by a Variable Force (Sec 11-4)
16	3/11	The Work-Energy Theorem (Secs 11-6 to 11-8)
17	3/16	Potential Energy (Secs 12-1 to 12-5)
18	3/18	Conservation of Energy (Secs 13-1 to 13-5)
19	3/23	Gravitation (Secs 14-2 to 14-7)
20	3/25	Review Chapters 8-14
Exam 2	3/30	Midterm Exam on Chapters 8 through 14
21	4/01	Fluids (Secs 15-1 to 15-5 and 16-1 to 16-4)
22	4/06	Simple Harmonic Oscillations (Secs 17-1 to 17-4)
23	4/08	Real Harmonic Oscillations (Secs 17-5, 17-7 and 17-8)
24	4/13	Wave motion (Secs 18-1 through 18-10)
25	4/15	Sound Waves (Secs 19-1 through 19-9)
26	4/20	Catch-up day
Final Exam	4/26	7:30 am-9:30 am

Class meeting attendance, make-up quizzes, etc...

Requirements for class meeting attendance and make-up quizzes, assignments, and other work in this course are consistent with university policies that can be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Accommodations for students with disabilities

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students

will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

UF grading policies

Information on current UF grading policies for assigning grade points can be found here:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Video recording of on-line lectures and activities:

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Online course evaluation:

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/

The Honor Pledge

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 or TAs in this class."

Counseling and Wellness Center

Contact information for the Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc/Default.aspx, 352-392-1575; and the University Police Department: 352-392-1111 or 911 for emergencies.

Technical Problems

If you experience technical difficulties please visit the UF help desk website (https://helpdesk.ufl.edu/ or call 352-392-4357 AND notify the instructor by email (matcheva@ufl.edu) in a timely manner.