

SYLLABUS

PHY 2020: Introduction to principles of physics, Spring 2024

Meetings: MWF period 8 (3:00 pm – 3:50 pm); Room NPB 1002.

Instructor: Khandker Muttalib, Professor of Physics. Email: muttalib@phys.ufl.edu

Office: NPB 2140, Tel: 352-392-6699.

Office hours (tentative): MTh period 7, or by appointment. To make appointment, please send email.

Teaching Assistant: TBA; Email:

Office hours: TBA

Textbook: Recommended (**not required**): Conceptual Physics, 12th Ed. By Paul Hewitt (Addison-Wesley). Lecture notes providing outlines of the lectures will be posted on Canvas before each lecture. Quizzes and exams will be based on topics covered in the lecture notes.

Purpose of the course: The course is designed for students who do not necessarily have any background in physics. It provides a one-semester overview of some basic concepts and meets the General Education Physical Science (“P”) requirement (with a grade of C or higher). It might also be useful as preparation for Physics I such as PHY 2053.

Prerequisite knowledge: Basic high school mathematics (algebra, geometry and trigonometry). The course covers a lot of material and proceeds quickly. A very good understanding of basic mathematics will be essential.

Instructional methods: The syllabus, lecture schedule, lecture notes, grades and all announcements will be posted on **Canvas**. Lectures and office hours will be face-to-face.

There will be daily quizzes, using **iClicker Reef Mobile**, to help your understanding and clarify misconceptions. You are expected to learn the concepts in class and build your understanding by solving homework and practice problems.

iClicker quizzes: We will be using iClicker Reef Mobile, please note that *iClicker remotes will not work*. You will be using your mobile device, but you will need to purchase access cards to iClicker Reef, available at the UF Bookstore at a reduced price via a special agreement between iClicker and UF. *However, the university may get a site license, in which case this would be free to students. So please wait until the first day of class to purchase (if need be).*

In order to receive credit, each student needs to [create an account in iClicker Reef](#):

- First and Last Name in your iClicker Reef account should match your name in Canvas.
- The Email in your iClicker Reef account should be your school email.
- The Student ID in the iClicker Reef account is the username you use to log in to Canvas.

To log in, click the *iClicker link* in Canvas, then sign in to your iClicker Reef account from the window that opens.

- Clicking the iClicker link in the Canvas course will ensure that your iClicker grades show up in my official gradebook.
- It will also add this iClicker course to your iClicker Reef account.

If needed, contact the iClicker Tech Support Team by visiting iclicker.com/support at any time. iClicker questions are multiple-choice, and 25% of the total grade will derive from these quizzes. Each question is worth 2 points for a correct answer, 1 point for incorrect, 0 for no response. Total number of points for the semester will be large, maybe 100 or more; we will scale that to 25% of the grade.

Exams: There will be three during-term exams which are closed-book and closed-note, but all essential formulae will be given.

Grading policy: Total grade consists of 25% from iClicker quizzes, 75% from three during-term exams. There is no final exam. The final letter grades will be assigned according to the following criteria:

A: $\geq 90\%$	A-: 85 – 89 %	
B+: 80–84%	B: 70 – 79 %	B-: 65 – 69 %
C+: 60–64%	C: 50 – 59 %	C-: 45 – 49 %
D+: 40 – 44 %	D: 35–39%	D-: 30–34%
E: $\leq 29\%$		

For current UF grading policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Lecture attendance and make-ups: Requirements for class attendance and make-up exams, 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>

Regular lecture-attendance is expected. Please make sure from the beginning of the course that you are available for the 3 during-term exams. Make-ups for these exams are rare but will be considered on a case-by-case basis; please contact the instructor. **There is NO make-up for iClicker quizzes.** Instead, since clickers can sometimes fail to operate properly, 10% of the total

number of quiz questions asked during the semester will be allowed as 'technical drops'. Thus, if 100 total questions are asked, 10 of your lowest scoring responses will be dropped in the final count.

Outline: (Detailed lecture schedule is posted separately)

- Part I: Math review, motion in one and two dimensions, Newton's laws.
- Part II: Circular motion, work and energy, gravity, linear and angular momentum, static equilibrium.
- Part III: Waves, electricity, magnetism, light.

Goals and objectives: This is a University of Florida General Education course, for which credit may be obtained in the "P" (Physical Sciences) category. The relevant "area objective" is: *The physical and biological sciences provide instruction in the basic concepts, theories and terms of the scientific method. Courses focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes that govern biological and/or physical systems. You will formulate empirically-testable hypotheses derived from the study of physical processes and living things, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate the outcomes of experiments.*

To achieve these goals, students will be expected to:

- analyze particular physical situations, and thus identify the fundamental principles pertinent to the situations
- apply principles to particular situations
- solve any equations arising from the application of identified principles of physics
- communicate results unambiguously

Student Learning Outcomes: This course will also assess Student Learning Outcomes which can be defined as: **Student Learning Outcomes: Content and Skills** Content: Students demonstrate competence in the terminology, concepts, theories, and methodologies used within the discipline. **Communication:** Students communicate knowledge, ideas, and reasoning clearly effectively in written and oral forms appropriate to the discipline. **Critical Thinking:** Students analyze information carefully and logically from multiple perspectives, using discipline-specific methods, and develop reasoned solutions to problems.

The Student Learning Outcomes will be assessed through many in-class quizzes, and 3 in-class closed-book exams. Quiz and exam questions will cover all subjects covered in lectures. Typical questions will require students to complete successfully all four steps outlined in the area objectives above. Obtaining the correct result to the question posed in the form requested in the question will be taken as evidence that all four of the steps have been correctly and successfully completed. In some questions students will be expected to choose between a series of possible explanations of physical outcomes; such explanations may be presented as graphs, numerically or in words. Although knowledge of the fundamental principles of physics is necessary for success in the course, the stress is on understanding how to apply the principles to a variety of

situations; rote memorization is minimal.

Academic Honesty: All University of Florida students are required to abide by the University's Academic Honesty Guidelines and by the Honor Code, which reads as follows:

We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. 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."

Cheating, plagiarism, or other violations of the Academic Honesty Guidelines will not be tolerated and will be pursued through the University's adjudication procedures.

Special Accommodations: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/> . It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester

Student Privacy: There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see the [Notification to Students of FERPA Rights](#).

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. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. 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 <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

Campus Resources:

Health and Wellness:

- U Matter, We Care: If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.
- Counseling and Wellness Center: counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.
- Sexual Assault Recovery Services (SARS): Student Health Care Center, 392-1161.
- University Police Department: at 392-1111 (or 9-1-1 for emergencies), or police.ufl.edu.

Academic Resources:

- E-learning technical support: 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
- Career Resource Center: Reitz Union, 392-1601. Career assistance and counseling.
- Teaching Center: Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.

- Writing Studio: 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.

Updates: As the course progresses, the syllabus may need updating to enhance the learning opportunity. Any such changes will be announced in class.

Lecture Schedule:

M 01/08 - Lect 00: Introduction

W 01/10 - Lect 01: Math review (units/graphs)

F 01/12 - Lect 02: Vectors

M 01/15 - No Lecture (Holiday)

W 01/17 - Lect 03: More on vectors

F 01/19 - Lect 04: Velocity and acceleration

M 01/22 - Lect 05: Motion in one dimension

W 01/24 - Lect 06: Free fall under gravity

F 01/26 - Lect 07: Motion in two dimensions

M 01/29 - Lect 08: Projectile motion

W 01/31 - Lect 09: Review

F 02/02 - Lect 10: Newton's laws of motion

M 02/05 - Lect 11: Force and acceleration

W 02/07 - Lect 12: More on forces

F 02/09 - Lect 13: Review

M 02/12 - Lect 14: Review for Exam 1

Exam 1: Tuesday 02/13 periods E2-E3 (8:20 pm – 10:10 pm)

W 02/14 - Lect 15: (Fun Lecture 1: Special Theory of Relativity)

F 02/16 - Lect 16: Course review. Circular motion

M 02/19 - Lect 17: More on circular motion

W 02/21 - Lect 18: Kinetic energy and work

F 02/23 - Lect 19: Conservation of energy

M 02/26 - Lect 20: Review

W 02/28 - Lect 21: Newton's law of gravity

F 03/01 - Lect 22: More on gravity

M 03/04 - No Lecture (Spring break)

W 03/06 - No Lecture (Spring break).

F 03/08 - No Lecture (Spring break).

M 03/11 - Lect 23: Momentum

W 03/13 - Lect 24: More on Momentum

F 03/15 - Lect 25: Review

M 03/18 - Lect 26: Angular motion and torque

W 03/20 – Lec 27: Angular momentum

F 03/22 - Lect 28: Review

M 03/25 - Lect 29: Review for Exam 2

W 03/27 - Lect 30: Fun lecture 2: Quantum mechanics and atoms

Exam 2: Wednesday 03/27 periods E2-E3 (8:20 pm – 10:10 pm)

F 03/29 - Lect 31: Waves

M 04/01 - Lect 32: More on waves

W 04/03 – Lec 33: Electricity

F 04/05 - Lec 34: More on electricity

M 04/08 - Lect 35: Review

W 04/10 - Lect 36: Magnetism

F 04/12 - Lect 37: More on magnetism

M 04/15 - Lect 38: Electromagnetic waves

W 04/17 - Lect 39: Properties of light

F 04/19 - Lect 40: Review

M 04/22 - Lect 41: Review for Exam 3

W 04/24 - Lect 42: Fun lecture 3: Wave-particle duality

Exam 3: Wednesday 04/24 periods E2-E3 (8:20 pm – 10:10 pm)