



## PHYS 214: The Nature of Physics, Fall 2023

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## Course Information

- Course number and title: **PHYS 214, The Nature of Physics, Spring 2023**
- CRN: 25673-001
- Meeting day(s) and time: **Mon. Wed. Fri. 08:30-09:20 AM, PHYS RM 114**
- Instructional Modality: On Campus and Face-to-Face Classroom
- Course credit hours: 3
- Prerequisites: None
- **Brightspace** course page: <https://purdue.brightspace.com/d2l/home/712325>
- We will be using McGraw-Hill's "Connect", register in Brightspace.

- Instructor: **Professor Koltick**
  - Office Location: Physics Building Room 335
  - Email Address: [Koltick@purdue.edu](mailto:Koltick@purdue.edu)
  - Consult: After Class or by appointment via e-mail.
  - When sending an e-mail: Make sure to place **Physics 214** in the subject line of your e-mail.
  - Your e-mail must be from a **Purdue University e-mail account**. e-mail from other than Purdue accounts will not be answered.
- Help Center: Mondays and Wednesdays 3:30-6:30 PM, PHYS RM 290

## Course Description

This is a survey course designed for non-science majors. It deals with Newtonian mechanics and motion, thermodynamics, electromagnetism, waves and optics, and modern physics. The course covers development of basic concepts and theories in physics, which are central to our understanding of the physics of everyday phenomena and of much of modern technology. The course shows the principle of physics, that is to use a small number of fundamental physical principles to explain a wide variety of physical phenomena. From this the seemingly complex universe, that is the world around us, can be understood from a limited number, simple fundamental principles. How to move from these principles to explain seemingly complex phenomena will be the goal of the course.

This is a 3-credit hour course. The rule of thumb is that an average student should spend approximately twice as many hours (on average) studying for this course outside of class as the time spent in class. That is, besides the 3 hours of in class room work, the student should spend six additional hours a week outside the class room, reading, doing homework, and studying for the quizzes and exams. From this, a typical student will **invest 9 hours per week** working on this course.

## Learning Resources, Technology & Texts

- Required text: **The Physics of Everyday Phenomena** (10th Edition), by W.T. Griffith and J.W. Brossing (McGraw-Hill, ISBN 978-0-07-351211-2). When you register for Connect you will have access to an electronic version of the book. This electronic book will be necessary to complete the graded pre-lecture assignments and the homework assignments.
- **Brightspace** learning management system (LMS): <https://purdue.brightspace.com/d2l/home/712325>  
Access the course via Purdue's Brightspace learning management system. We will use Brightspace for course management. Course information, syllabus, course schedule, lecture slides, etc. will be disseminated via Brightspace.

It is strongly suggested that you explore and become familiar not only with the site navigation but also with content and resources available for this course. Also see the Student Services widget on the campus homepage for resources such as Technology Help, Academic Help, Campus Resources, and Protect Purdue.

- **Connect** is linked from Brightspace: All homework assignments and pre-lecture quizzes are to be worked on and submitted using the **Connect** system. The grade book will appear in Brightspace. There will be a reading assignment with a pre-lecture quiz for every lecture. The assignment is to be completed by 8:00 am on the day of the lecture.
  - The first time you log on to Brightspace this semester using your career account username and password, immediately do two things:

- ✓ Register for Physics 214 on Connect.
  - ✓ Register your i-Clicker for this course (even if you've registered it for another course, you **MUST** register it for THIS COURSE).
- **Clicker:** We use the i-Clicker audience response system. Purchase an i-Clicker unit if you don't have one already.
  - **Hardware requirements:** You will need a scientific calculator for lecture quizzes, homework, and exams.
  - **Tutoring support:** One of your most valuable resources will be your fellow students. Studying and doing homework in a group setting is an excellent way to reinforce your work habits as well as to learn fresh points of view and lines of attack on problems. Also, explaining problems and concepts to others will help you clarify what you do and do not understand about the material. However, please do keep in mind that a group session doesn't mean that you split the assigned problems and just do your part, copying answers of the remaining parts from others. Remember that all assignments in this course are assigned to individuals and not to a group. Your group is there to exchange ideas and discuss how to solve problems but not for you to obtain complete solutions or answers.

In addition, you can seek help in the Help Center at anytime the help center is open.

## Learning Outcomes

By the end of the course, you will be able to:

1. Identify physics problems
  - Methods of Evaluation: participation in class discussions
2. Demonstrate abilities to connect problems to physics concepts
  - Methods of Evaluation: lecture quizzes and participation in class discussions
3. Outline strategies to solve physics problems
  - Methods of Evaluation: homework and exams
4. Execute problem solving
  - Methods of Evaluation: homework and exams
5. Develop overall comprehension of physics of the universe
  - Methods of Evaluation: class discussions, knowledge of principles and generalizations, questioning and probing, critiques and debates, initiative of further learning and peer instruction.

## Assignments

Your learning will be assessed through a combination of **pre-lecture quizzes, lecture quizzes, homework, two midterm exams and a final exam** spread throughout the academic period. Details on these assignments, including a schedule of due dates, can be found in **course schedule** and are implemented in the **“Connect” system**.

- To get an organized overview of the material and to start thinking about the material, please read the textbook before the corresponding lecture according to the **course schedule** presented in Brightspace. Bring your questions to the lecture will help you understand the content. Make written notes of anything that you don't understand and use them to ask questions after the class or during the class.

- There is a **pre-lecture reading quiz** before each lecture in Connect. You have a window of usually 2 days, immediately after the previous lecture (9:30AM) and before the lecture (8AM), to enter answers into *Connect*. Each correct response submitted before the deadline and within the allowed attempt number limit will receive 100% credit. No credit is given after deadline. The pre-lecture reading assignment can be done ahead of time.
- **Lectures:** Three 50-minute lectures are scheduled each week on Monday, Wednesday and Friday at 8:30 AM. Lectures are not optional. You should read assigned sections of the text before coming to class and use the lecture to clarify and to reinforce your understanding.
- We will have **i-Clicker quizzes** during most lectures except the first week and the last week. Each lecture is worth 2 points (1 point for attendance, and 1 point for a correct answer). We use **i-Clicker** in class. You must purchase an *i-Clicker* (from the bookstore or elsewhere). **You must register your i-Clicker serial number (clicker ID) in the student grade book in Brightspace (NOT on the i-Clicker Web site).** A number of i-Clicker questions will be dropped from the grading, the exact number to be dropped is not set yet but towards the end of the semester.
- **Homework:** Deadlines are set in *Connect* according to chapters (also see course schedule). There is a homework assignment for each lecture. One chapter may have multiple homework sets. They have the same deadline, the first class day the week following the presentation of the material. They also have the same start time.
- **Midterm Exams:**
  - Exam I: Wednesday, February 15, IN CLASS
  - Exam II: Wednesday, March 29, IN CLASS
- **Final Exam:** Final exam time and date has not yet determined.
- **When Turning In Your Exam for Scoring You Will Be Asked to Present Your Student ID.**
- All exams are closed book. Formula sheets will be provided and posted before time so the sheet can be used to study from. Notes are not allowed. Phone use is not allowed during exams. The use of earphones is not allowed during an exam. Basic scientific calculators are allowed, but calculators with communication functionalities or with powerful functionalities similar to a mini-computer are not allowed in exams.
- If you have a conflict or are sick, you must contact the instructor as soon as possible before the exam. Generally, you should not assume that a make-up exam will be given. Unexcused absences will be scored as zero.
- If you have official university permission to obtain special arrangement for the class, please inform the instructor during the first week of class to discuss your special needs.

## • Grading Scale

Grades will be determined from points awarded in each of the following categories:

- Total 39 pre-lecture quizzes, worth 2 points each. For a total of 78 points. However, the lowest 8 scores will be dropped (Allowing, a student to miss 8 pre-lecture quizzes and still get the maximum 62 points). The points are then scaled to a maximum of 50 points.
- Lecture quizzes, worth a total of 50 points. We will have 39 lectures with up to 39 lecture quizzes, each of them is worth 2 points (1 point for attendance and 1 point for a correct answer). Again, the lowest 5 lecture quizzes will be dropped. And the total remaining will be scaled to a maximum possible 50 points (i.e. one can miss 5 lecture quizzes and still get the maximum points).
- Total 39 homework sets assigned in Connect. The 5 lowest scores will be dropped (i.e. one can miss 5 homework assignments and still get the maximum points) The remaining score will be scaled to 340 points.
- Two in class mid-term exams, worth 150 points each.
- A final exam scheduled for 2 hours during finals week, worth 250 points.

Assignments	Number Total/Drop	Scaled Points
Pre-Lecture Quizzes	39/8	50
Lecture Quizzes	39/5	50
Homework	39/5	350
Exam 1	1/0	150
Exam 2	1/0	150
Final Exam	1/0	250
		<b>Total: 1000</b>

We are using **Brightspace** as our grade book. A running tally of your scores will be posted on *Brightspace*. Allow a few days for the lecture quiz scores to show up. You should check the *Brightspace* grade book on a regular basis and report any questions you have to Professor Koltick. Remember that grades in Brightspace will need scaling at the end of the semester before a true grade can be assigned.

At the end of the semester, final grades will be calculated by adding the total points earned and translating those numbers (out of 1000) into a letter grade. You are guaranteed these grades if you achieve the listed points, but I may lower the cut-off points based on circumstances.

Please note that if a student has an unusually skewed distribution of points from the different elements of the course, this fact may affect the final grade.

Grade	Lower Bound
A	850 (85%)
B	750 (75%)
C	650 (65%)
D	500 (50%)

Drop course: **Please Note:** I will sign any drop slip as *W* until a deadline specified by the university. Past this date, we are required to add *F* to *W* if your grade is failing at that point in the course.

Your fellow students are a valuable learning resource and studying in groups is encouraged. However, all *grades* are attributed to the *individual*. While it is an excellent idea to study together and discuss how to attack homework problems with other students in the course, no one should *copy* someone else's solution and/or answers. Blindly plugging in your set of randomly generated numbers in homework into a formula someone gave you would not only be cheating but also disrupt your learning process. If a student is found to have engaged in an academically dishonest activity, that person will be reported to the Dean of Students office for disciplinary action. A person found to be misrepresenting themselves as another student will be given the grade F for the course. For example, **running an i-Clicker for an absent student in lecture is consider academic fraud and both students will be reported to the Dean of Students for practicing fraud.**

## Attendance Policy

This course is designed to be face-to-face in a class room setting. University policy states that students are expected to be present for every meeting of the classes in which they are enrolled. For the purposes of this course, being “present” means attending all face-to-face meetings unless you are ill or need to be absent for one of four “excused” reasons: grief/bereavement, military service, jury duty, or parenting leave (go to the [Office of the Dean of Students website](#) for details on how to submit those requests).

## Academic Guidance in the Event a Student is Quarantined/Isolated

If you must quarantine or isolate at any point in time during the semester, please notify me immediately via email so that we can communicate about how you can continue to learn remotely. Work with the Protect Purdue Health Center (PPHC) to get documentation and support, including access to an Academic Case Manager who can provide you with general guidelines/resources around communicating with your instructors, be available for academic support, and offer suggestions for how to be successful when learning remotely. Your Academic Case Manager can be reached at [acmq@purdue.edu](mailto:acmq@purdue.edu). Importantly, if you find yourself too sick to progress in the course, notify your academic case manager and notify me via email. We will make arrangements based on your particular situation.

## Course Schedule

The Purdue Academic Calendar can be found here: [Academic Calendar](#).

The **Course schedule** can be found on Brightspace: Content -> Schedule.

The course schedule may be subject to changes during the semester. Any major changes will be announced on Brightspace and/or via email. The course schedule linked from Brightspace is always kept up-to-date. Please check the schedule often.

## Classroom Guidance Regarding Protect Purdue

The [Protect Purdue Plan](#), which includes the [Protect Purdue Pledge](#), is campus policy and as such all members of the Purdue community must comply with the required health and safety guidelines. Required behaviors in this class include: staying home and contacting the Protect Purdue Health Center (496-INFO) if you feel ill or know you have been exposed to the virus, properly wearing a mask when required

Please see the [Office of the Student Rights and Responsibilities](#) and also the [Purdue University Bill of Student Rights](#)."

*Related Considerations:*

1. *A listing of recommended safe practices for the specific class or laboratory setting (other PPE or safety behavior) can be found at the links below.*
  - [Overarching SOP for Classrooms, Instructional Laboratories, and Experiential Courses](#)
2. *References Supporting Protect Purdue Compliance:*
  - Office of the Dean of Students [Protect Purdue Compliance Plan: Ask, Offer, Leave, Report](#)
  - Office of the Dean of Students [Managing Classroom Behavior and Expectations](#)

## Academic Integrity

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing [integrity@purdue.edu](mailto:integrity@purdue.edu) or by calling 765-494-8778. While information may be submitted anonymously, the more information is submitted the greater the opportunity for the university to investigate the concern. More details are available on our course Brightspace table of contents, under University Policies.

Appendix A of this document includes important Guidelines for Academic Integrity in this class.

## Nondiscrimination Statement

Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life. A hyperlink to Purdue's full Nondiscrimination Policy Statement is included in our course Brightspace under University Policies.

## Accessibility

Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: [drc@purdue.edu](mailto:drc@purdue.edu) or by phone: 765-494-1247.

## Mental Health/Wellness Statement

**If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try [WellTrack](#).** Sign in and find information and tools at your fingertips, available to you at any time.

**If you need support and information about options and resources,** please contact or see the [Office of the Dean of Students](#). Call 765-494-1747. Hours of operation are M-F, 8 am- 5 pm.

**If you find yourself struggling to find a healthy balance between academics, social life, stress, etc.** sign up for free one-on-one virtual or in-person sessions with a [Purdue Wellness Coach at RecWell](#). Student coaches can help you navigate through barriers and challenges toward your goals throughout the semester. Sign up is completely free and can be done on BoilerConnect. If you have any questions, please contact Purdue Wellness at [evans240@purdue.edu](mailto:evans240@purdue.edu).

**If you're struggling and need mental health services:** Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact [Counseling and Psychological Services \(CAPS\)](#) at 765-494-6995 during and after hours, on weekends and holidays, or by going to the CAPS office on the second floor of the Purdue University Student Health Center (PUSH) during business hours.

## Basic Needs Security

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. There is no appointment needed and Student Support Services is available to serve students 8 a.m.-5 p.m. Monday through Friday. Considering the significant disruptions caused by the current global crisis as it related to COVID-19, students may submit requests for emergency assistance from the [Critical Needs Fund](#)

## Emergency Preparation

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted onto the course website or can be



obtained by contacting the instructors or TAs via email. You are expected to read your @purdue.edu email on a frequent basis.

#### *Related Considerations and Guidelines*

1. *If you experience any symptoms of COVID-19 or suspect you may have been exposed to someone with COVID-19 stay home and call the Protect Purdue Health Center at 765-496-INFO.*
2. *Keep your cell phone on to receive a Purdue ALERT text message.*
3. *Log into a Purdue computer connected to the network to receive any Desktop Popup Alerts.*
4. *If you have a “no cell phone” in class policy, allow one or two students who have signed up for Purdue ALERT to keep their phones on to receive any alerts*

## **Appendix A - Guidelines for Academic Integrity**

Your fellow students are a valuable learning resource and studying in groups is encouraged. However, all *grades* are attributed to the *individuals*. While it is an excellent idea to study together and discuss how to attack homework problems with other students in the course, no one should be *copying* someone else's solution and/or answer. Just blindly plugging in your set of randomly generated numbers in homework into a formula someone gave you would not only be cheating but also disrupt your learning process.

All exams in this course are closed book. Formula sheets will be provided. Notes are not allowed beyond those stated by the instructor prior to each exam. Phone use is not allowed during exams. Basic calculators are allowed, but calculators with communication functionalities or with powerful functionalities similar to a mini-computer are not allowed in exams.

Incidents of academic misconduct in this course will be addressed by the course instructor and referred to the Office of Student Rights and Responsibilities (OSRR) for review at the university level. Any violation of course policies as it relates to academic integrity will result minimally in a failing or zero grade for that particular assignment, and at the instructor's discretion may result in a failing grade for the course. In addition, all incidents of academic misconduct will be forwarded to OSRR, where university penalties, including removal from the university, may be considered.

*Students can report issues of academic integrity that they observe, and may do so anonymously, through the OSRR by calling 765-494-8778 or emailing [integrity@purdue.edu](mailto:integrity@purdue.edu).*