

Course Information

- PHY 22000 “General Physics”
- CRN 27016, 27017, 10333, 18331
- 4 Course credit hours
- Prerequisites: College algebra and trigonometry

Instructors Contact Information

Lecturers: Prof. Norbert Neumeister (Section 2)
Office: Room 372, Physics Building
Phone: 765 494-5198
E-mail: neumeist@purdue.edu
Office hours: Tuesday 10:00 – 11:00 am or by appointment

Dr. Jeffrey Gerber (Sections 1, 3 and 4)
Office: Room 290C, Physics Building
E-mail: gerber48@purdue.edu
Office hours: Monday and Wednesday 2:30 – 3:30 pm or by appointment

Recitation

Instructors: Pavani Devabathini (Sections 1 and 2)
Office: Room 40, Physics Building
E-mail: pdevabat@purdue.edu
Office hours: Tuesday 1:30 – 4:30 pm in room 290

Abigail Hickin (Sections 3 and 4)
Office: Room 308, Physics Building
E-mail: ahickin@purdue.edu
Office hours: Wednesday 1:00 – 4:00 pm in room 290

Lab

Coordinator: Dr. Andrzej (Andrew) Lewicki
Office: Room 142, Physics Building
E-mail: lewicki@purdue.edu

Make sure that your email subject line includes “PHYS 220”, or else your message will likely be lost/ignored.

Course Description

This course covers mechanics, heat, and waves, for students not specializing in physics. The course has three different components: Lecture, Recitation, and Laboratory. The lectures will concentrate on developing an understanding of fundamental concepts. The recitations will be devoted to developing problem-solving skills. The laboratory will give you a chance to test the laws of physics presented in the lecture. Note that different people are in charge of the three components. This course will rely heavily on modified MasteringPhysics® for homework and pre-lab assignments.

Participation by students in lectures will be facilitated via use of *iClickers* and students are expected to bring registered devices to each class.

The course is structured in 17 weeks. There will be 26 lectures with quizzes, 13 homework assignments and 10 labs. Discussion forums are provided for each course component: lecture, homework, and lab. Please post your questions in the corresponding forum.

Class

Lectures:

Room 114, Physics Building

Monday and Wednesday	10:30 – 11:20 Section 1
	11:30 – 12:20 Section 2
	12:30 – 1:20 Section 3
	1:30 – 2:20 Section 4

Recitation:

Room 114, Physics Building

Friday 10:30 – 11:20	Section 1
Friday 11:30 – 12:20	Section 2
Friday 12:30 – 1:20	Section 3
Friday 1:30 – 2:20	Section 4

Learning Resources, Technology & Texts

- Required Textbook:
 - *College Physics*, Etkina, Planinsic, Van Heuvelen, 2nd Ed. (Pearson Custom Publishing) with MasteringPhysics[®]
 - *iClicker* student engagement device, which can be purchased from local bookstores or online through Amazon.com.
- Computer with Internet access, Microsoft Excel, and Adobe Reader.
- You can access the course via Brightspace. It is strongly suggested that you explore and become familiar not only with the site navigation, but with content and resources available for this course. See the Help tab for resources.
- Supplemental Instruction (SI) Sessions
 - There are Supplemental Instruction (SI) study sessions available for this course. These study groups are open to anyone enrolled in this course who would like to stay current with the course material and understand the material better. Attendance at these sessions is voluntary, but extremely beneficial for those who attend regularly. Times and locations for the help sessions can be found here: www.purdue.edu/si or on the PurdueGuide app (purdue.edu/asc/PurdueGuide.html). Students who attend these interactive sessions will find themselves working with peers as they compare notes, demonstrate and discuss pertinent problems and concepts, and share study and test-taking strategies. Students are asked to arrive with their student ID card, lecture notes and questions to these informal, peer-led study sessions.

Learning Outcomes

By the end of this course, students will:

- Describe motion using sketches, motion diagrams, graphs, and algebraic equations, and look for consistency between different representations.
- Explain *why* objects move the way they do.
- Apply Newton's laws in situations in which other objects exert forces on the object of interest.
- Analyze situations in which the rotational velocity of rigid bodies changes.
- Analyze vibrational motion using motion, forces, and energy approaches.
- Describe wave motion using a sinusoidal function of two variables
- Understand the ideal gas model and use it to explain the behavior of gases
- Connect the microscopic understanding of the gas processes to the work-heating-energy concepts.

Methods of evaluation include lecture quizzes, labs, homework problems, and exams.

Lectures

Lectures are carefully designed to introduce new material. They also provide opportunities to ask questions and discuss topics that you may find interesting or difficult to understand. Please do not hesitate to ask questions! Demonstrations and discussions facilitated with *iClickers* will take place during lectures to illustrate and develop key concepts. A tentative reading and homework assignment schedule can be found at the conclusion of this syllabus. You are encouraged to prepare for each lecture by reading the assigned sections before coming to class.

Considerable material will be covered so it is important to not fall behind. To be successful in this course it is recommended that you strive to faithfully complete the following:

1. Attend class.
2. Take the quiz.
3. Take notes during lecture and as you read the textbook. The very act of notetaking aids in your ability to remember the material.
4. Read and keep up to date with the text.
5. You are encouraged to not limit yourself to homework and attempt as many problems as possible. Always write down units and carry the units through all of the calculations.
6. As you study, stop and ask yourself if you understand what you are reading. If not, review the material until you understand it or make arrangements to have it explained either in class, by the TA, or during office hours.

Recitations

Working through problems is critical towards correctly understanding and applying concepts. Recitations are opportunities to get feedback and advice on how to solve such problems. During weeks when exams or holidays occur, a recitation may be substituted with a review or lecture.

Homework

The modified MasteringPhysics® from Pearson will be used to assign credit for homework completed this semester. The homework assignment for each week typically consists of approximately 10 problems. There will be 13 homework assignments during the semester and your final homework score will be scaled to equal 15% of your final grade. The extra homework credit is just applied to the homework component of the grade, which cannot exceed 100%.

Using the MasteringPhysics® web-based system you can enter answers to homework problems by using your personal Pearson account. For most problems, you will receive several attempts for 100% credit. *Usually, no credit will be given for correct answers after the 5th attempt.* **The time cutoff for answering homework for full credit will be 11:59 PM (EST) on the Monday that the homework problems are due.** This means that if you run into problems answering the homework questions on the weekend, you can ask about them on Monday and complete them by Monday evening. After you use your five tries for 100% credit, you are still encouraged to submit answers until you correctly solve the problem. MasteringPhysics® will inform you if your answer is correct. However, once the number of attempts exceeds the five attempts no credit will be assigned. Each homework problem has randomly generated input values so each student will have a unique answer. Make sure that you use your own input values when solving each problem. To receive credit, your answer must be within $\pm 1\%$ of the correct answer, so you are advised to carry at least 4 significant figures in your calculations. The homework grading policy is as follows:

- Multiple choice problems have only one attempt for full credit.
- Numerical problems have a maximum of 5 attempts before the deadline to obtain 100% credit.
- Late homework submission will be accepted at reduced credit (1 day late = 80%, 2 days late = 60%, 3 days late = 40%, 4 days late = 20%, >4 days late = 0%).
- *Your lowest homework assignment score will be dropped.*

Laboratory

Physics 220 laboratory is not a separate course, but it is a component of the Physics 220 course. Please see the lab syllabus for details.

Help Center

If you have problems with homework or lab assignments, you may contact your lab TA during the scheduled lab day and time. The instructions and the Help Center schedule are available on Brightspace inside Course Help segment or directly at:

http://www.physics.purdue.edu/academic-programs/docs/help_centers/HC218220.pdf

You could also contact your TA using email. Emails of all teaching assistants are listed on the Help Center schedule page.

Exams

There will be two 1.5-hour exams during the semester and a 2-hour final exam. The chapters covered on each exam and the room assignments for each evening exam will be confirmed and announced about a week before the exam date. All exams are closed book, and you must remember to bring your ID to the exams. We will provide a formula sheet for each exam. Cheaters will be given an F in the course and will be reported to the Dean of Students. The exams will take place on:

Exam 1: October 3, 2022
Exam 2: November 16, 2022
Final exam: TBD

Additional information regarding the final exam will be announced later. No make-up exams are scheduled for this course. If you arrive late for an exam or miss it entirely, there is no make-up exam that you can take. Students with adaptive learner status should email or speak with their lecturer before the first exam and must make arrangements with the DRC **at least a week** before each exam. The exams must be taken in the DRC on the same day as the regular exam.

Participation

Lectures will make regular use of *iClicker* devices that will be scored for class participation credit. Be sure that your device is functioning and correctly registers your responses. Generally each correct answer will be awarded 2 points, each incorrect answer 1 point. The lowest two scores will be dropped.

Quizzes

After each lecture you need to take a quiz to check your understanding of the lecture. Each quiz consists of about 3 questions, and you will have 10 minutes to complete the quiz. Please note that only your first attempt will be graded. The final deadline is Friday at 11:59 pm ET. The lowest two scores will be dropped.

Grading and Assignments

Your final grade will be derived as follows:

2 midterm exams (each worth 15%)	30%
Final Exam	30%
Homework	15%
Laboratory	20%
Quizzes	3%
Participation/iClicker	2%

We will use an absolute scale to set the grades as given in the table below. However, if the letter grades are lower than we think is reasonable at the end of the semester, then we may lower the grade thresholds, but we will not raise the thresholds. (This means if you get at least 89%, you are **guaranteed to get an A- or possibly better.**)

Grade	Percentage
A+	96%
A	93%
A-	90%
B+	86%
B	83%
B-	80%

C+	76%
C	73%
C-	70%
D+	66%
D	63%
D-	60%
F	<60%

The requirements for passing the lab are given in the separate page on lab policies and work. During the semester, you should regularly check that your exam, lab, homework, and participation grades have been correctly entered into your Gradebook. **It is your responsibility to bring any problems with your assigned grades to the attention of your instructor immediately.** *Report any errors to your lab TA or instructor within 2 weeks from when the grades are recorded.*

Absences and Excused Grades

Unexcused absences from any midterm exam will be assigned a zero grade. Excused grades will be given only in one of the following circumstances: (1) illness; (2) personal crisis (e.g., automobile accidents, required court appearance, death of a close relative); and (3) required attendance at an official Purdue activity (i.e., athletics). You **must** contact your lecturer as soon as possible but **before** the exam and discuss your problem. No excuses will be accepted after the exam has been given. Appropriate documents (e.g., a written note from a doctor, with his/her name and phone number included) may be needed to judge the merit of the excuse. More than one exam will likely not be excused. **Missing the final exam cannot be excused.**

A student can contact the [Office of the Dean of Students \(ODOS\)](#) to request that a notice of the leave be sent to instructors when a situation involving **hospitalization, emergency department or urgent care visits emerges**. The student can then provide documentation of hospitalization, emergency department or urgent care as proof of legitimate absence to the ODOS as soon as these documents are available.

Academic Guidance in the Event a Student is Quarantined/Isolated

If you become quarantined or isolated at any point in time during the semester, in addition to support from the Protect Purdue Health Center, you will also have access to an Academic Case Manager who can provide you academic support during this time. Your Academic Case Manager can be reached at acmq@purdue.edu and will 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. Importantly, if you find yourself too sick to progress in the course, notify your academic case manager and notify me via email or Brightspace. We will make arrangements based on your particular situation. The Office of the Dean of Students (odos@purdue.edu) is also available to support you should this situation occur.

Attendance Policy during COVID-19

Students should stay home and contact the Protect Purdue Health Center (496-INFO) if they feel ill, have any symptoms associated with COVID-19, or suspect they have been exposed to the virus. In the current context of COVID-19, in-person attendance will not be a factor in the final grades, but the student still needs to inform the instructor of any conflict that can be anticipated and will affect the submission of an assignment or the ability to take an exam. Only the instructor can excuse a student from a course requirement or responsibility. When conflicts can be anticipated,

such as for many University-sponsored activities and religious observations, the student should inform the instructor of the situation as far in advance as possible. For unanticipated or emergency conflict, when advance notification to an instructor is not possible, the student should contact the instructor as soon as possible by email, through Brightspace, or by phone. When the student is unable to make direct contact with the instructor and is unable to leave word with the instructor's department because of circumstances beyond the student's control, and in cases of bereavement, quarantine, or isolation, the student or the student's representative should contact the Office of the Dean of Students via [email](#) or phone at 765-494-1747. Our course Brightspace includes a link on Attendance and Grief Absence policies under the University Policies menu.

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 [in classrooms and campus building](#), at all times (e.g., mask covers nose and mouth, no eating/drinking in the classroom), disinfecting desk/workspace prior to and after use, maintaining appropriate social distancing with peers and instructors (including when entering/exiting classrooms), refraining from moving furniture, avoiding shared use of personal items, maintaining robust hygiene (e.g., handwashing, disposal of tissues) prior to, during and after class, and following all safety directions from the instructor.

Students who are not engaging in these behaviors (e.g., wearing a mask) will be offered the opportunity to comply. If non-compliance continues, possible results include instructors asking the student to leave class and instructors dismissing the whole class. Students who do not comply with the required health behaviors are violating the University Code of Conduct and will be reported to the Dean of Students Office with sanctions ranging from educational requirements to dismissal from the university.

Any student who has substantial reason to believe that another person in a campus room (e.g., classroom) is threatening the safety of others by not complying (e.g., not wearing a mask) may leave the room without consequence. The student is encouraged to report the behavior to and discuss next steps with their instructor. Students also have the option of reporting the behavior to the [Office of the Student Rights and Responsibilities](#). See also [Purdue University Bill of Student Rights](#).

Academic Integrity

Academic integrity encompasses the core values and basic principles of honesty and responsibility that govern our practices as scholars, researchers, and creative artists at Purdue. *Purdue prohibits dishonesty in connection with any University activity.* Acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and is not tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest.

Do not let the anonymity of a large class lull you into a false confidence that cheating is acceptable. Cheating compromises yourself, your classmates, and the University, and instances will be handled sternly. If you are aware of someone who is cheating do not hesitate to let me know. Be discrete

but confident that it is the right thing to do. Alternatively, individuals may alert university officials to potential breaches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern.

[Purdue's Honor Pledge](#): "As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue."

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 own 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. More details are available on our course Brightspace table of contents, 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 or by phone: 765-494-1247. More details are available on our course Brightspace under Accessibility Information.

Mental Health 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.

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 of the second floor of the Purdue University Student Health Center (PUSH) during business hours.

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 or phone. You are expected to read your @purdue.edu email on a frequent basis.

Disclaimer

Course requirements, deadlines and grading percentages are subject to changes that may be necessitated in the event of major campus emergency or other circumstances. You can get information about changes in this course in Brightspace. Notes are considered to be derivative works of the instructor's presentations and materials, and thus are subject to the instructor's copyright in such presentations and materials.

Course Schedule

	Date		Lecture Topics/Reading Assignments	Deadline
Week 1	Aug 22	Lecture 1	Introduction, Ch 2: Kinematics	
	Aug 24	Lecture 2	Ch 2: Motion in One Dimension	
	Aug 26	Recitation 1		
Week 2	Aug 29	Lecture 3	Ch 3: Newtonian Mechanics	HW 1
	Aug 31	Lecture 4	Ch 4: Applying Newton's Laws	
	Sep 2	Recitation 2		
Week 3	Sep 5	Labor Day (no class)		HW 2
	Sep 7	Lecture 5	Ch 4: Applying Newton's Laws	
	Sep 9	Recitation 3		
Week 4	Sep 12	Lecture 6	Ch 4: Projectile Motion	HW 3
	Sep 14	Lecture 7	Ch 5: Circular Motion	
	Sep 16	Recitation 4		
Week 5	Sep 19	Lecture 8	Ch 5: Planetary Motion	HW 4
	Sep 21	Lecture 9	Ch 6: Impulse and Linear Momentum	
	Sep 23	Recitation 5		
Week 6	Sep 26	Lecture 10	Ch 7: Work and Energy	HW 5
	Sep 28	Lecture 11	Ch 7: Work and Energy	
	Sep 30	Recitation 6		
Week 7	Oct 3	Lecture 12	Ch 7: Power and Collisions	HW 6
	Oct 3	Exam 1		
	Oct 5	Lecture 13	Ch 8: Extended Objects	
	Oct 7	Recitation 7		
Week 8	Oct 10	October break (no class)		HW 7

	Oct 12	Lecture 14	Ch 9: Rotational Motion	
	Oct 14	Recitation 8		
Week 9	Oct 17	Lecture 15	Ch 9: Angular Momentum	HW 8
	Oct 19	Lecture 16	Ch 9: Rolling Objects	
	Oct 21	Recitation 9		
Week 10	Oct 24	Lecture 17	Ch 12: Gases	HW 9
	Oct 26	Lecture 18	Ch 12: Gases	
	Oct 28	Recitation 10		
Week 11	Oct 31	Lecture 19	Ch 13: Fluids	HW 10
	Nov 2	Lecture 20	Ch 13: Fluids	
	Nov 4	Recitation 11		
Week 12	Nov 7	Lecture 21	Ch 14: Fluids in Motion	HW 11
	Nov 9	Lecture 22	Ch 14: Fluids in Motion	
	Nov 11	Recitation 12		
Week 13	Nov 14	Lecture 23	Ch 10: Oscillations and Vibrations	HW 12
	Nov 16	Lecture 24	Ch 11: Waves	
	Nov 16	Exam 2		
	Nov 18	Recitation 13		
Week 14	Nov 21	<i>Thanksgiving Vacation (no class)</i>		
	Nov 23	<i>Thanksgiving Vacation (no class)</i>		
	Nov 25	<i>Thanksgiving Vacation (no class)</i>		
Week 15	Nov 28	Lecture 25	Ch 15: Heat	HW 13
	Nov 30	Lecture 26	Ch 16: Second Law of Thermodynamics	
	Dec 2	Recitation 14		
Week 16	Dec 5	<i>No class (due to exam 1)</i>		
	Dec 7	<i>No class (due to exam 2)</i>		
	Dec 9	Recitation 15		
Week 17	Dec 12-16	Final Exam		

* Schedule and assignments subject to change. Any changes will be posted in Brightspace.