

Course Information

- PHY 220 “General Physics”
- CRN 27016, 27017, 10333
- 4 Course credit hours
- Prerequisites: College algebra and trigonometry

Instructors Contact Information

Lecturers: **Prof. Norbert Neumeister** (Section 1)
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

Prof. Jonathan Hood (Section 2 & 3)
Office: B155 BRWN
Phone: 765 494-5278
E-mail: hoodjd@purdue.edu
Office hours: Thursday 3:00 – 4:00 pm or by appointment using [Zoom](#)

Recitation

Instructor: **Pavani Devabathini**
Office: Room 40, Physics Building
E-mail: pdevabat@purdue.edu
Office hours: Friday 3:00 – 5:00 pm

Lab

Coordinator: **Dr. Andrzej (*Andrew*) Lewicki**
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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.

- 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 notes during lecture and as you read the textbook. The very act of notetaking aids in your ability to remember the material.
3. Read and keep up to date with the text.
4. 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.
5. 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.

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.
- *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. The exact schedule of experiments is located at the end of this lab syllabus. You **DO NOT** need a lab manual this semester.

Before completing each lab assignment, you must answer prelaboratory questions scheduled for that week. These questions are closely related to the activities and measurements you will do in the lab. The prelaboratory questions typically require 20-30 minutes of effort. The prelaboratory questions are your individual work, so everyone is expected to complete them. **The prelaboratory questions must be answered on-line** using *MasteringPhysics* (the same online software that you are going to use for homework assignments). If you exceed the number of allowed attempts for a prelab question, then you will not get credit for that question. **The deadline for prelaboratory questions is on Tuesday, 9:30 AM for all lab sections.** Check the lab schedule at the end of this lab syllabus for exact dates. If you submit answers to the prelaboratory questions after the posted deadline, then your score will be lowered by 20% for each day that it is late. The prelaboratory questions are graded by computer and the scores will be posted in the course gradebook on Brightspace, but not instantaneously. **It usually takes a few hours** before the scores are transferred from MasteringPhysics to Brightspace. Use at least **4 significant figures** in your calculations.

During the two-hour laboratory period, you will observe phenomena, manipulate the lab apparatus, collect data and ask questions. Your lab TA will briefly review the theory behind the experiment and describe the lab equipment to be used. Next, you will follow the lab procedures described in the lab files, collect data, calculate results and prepare required graphs. In the Physics 220 lab, you will work with lab partner.

Students are expected to **complete the lab report and return it to the lab TA before the end of the scheduled lab time.** Only one lab report is required for two lab partners. We have lab make-ups scheduled for students who missed labs for a valid reason (e.g., illness). All lab make-ups are done in the same room at the same day of the week and the same time as regular classes.

In case of a long illness, (e.g., a week or more in a hospital) you need to get permission from the **lab coordinator** to make up the missed labs. If you have any questions concerning the lab policies, please ask the **lab coordinator**.

Each laboratory report (**including prelabs**) is worth up to 10 points. We have ten labs scheduled for this semester. Ten labs times 10 points = 100 points). The perfect score is 100 points for the lab (or 100%). The lab contribution to the total grade is 20%, so the perfect lab score will give you 20% of the total perfect score for Physics 220.

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. Those with adaptive learner status should email or speak with their lecturer before the first exam. The exams will take place on:

Exam 1: September 28, 2021

Exam 2: November 16, 2021

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.

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. On average, there will be 2-3 questions asked during each lecture and generally each correct answer will be awarded 2 points, each incorrect answer 1 point. The lowest five 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%
Participation/Quizzes	5%

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.**

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 23	Lecture 1	Introduction, Ch 2: Kinematics		
	Aug 24	Lab	Lab Introduction and Math Diagnostics		
	Aug 25	Lecture 2	Ch 2: Motion in One Dimension		
	Aug 27	Recitation 1			
Week 2	Aug 30	Lecture 3	Ch 3: Newtonian Mechanics	HW 1	
	Aug 31	Lab	M1 – Measurements and Experimental Errors		
	Sep 1	Lecture 4	Ch 3: Applying Newton's Laws		
	Sep 3	Recitation 2			
Week 3	Sep 6	<i>Labor Day (no class)</i>		HW 2	
	Sep 7	Lab	M2 – Newton's Laws of Motion		
	Sep 8	Lecture 5	Ch 4: Applying Newton's Laws		
	Sep 10	Recitation 3			
Week 4	Sep 13	Lecture 6	Ch 4: Projectile Motion	HW 3	
	Sep 14	Lab	M3B – Projectile Motion		
	Sep 15	Lecture 7	Ch 5: Circular Motion		
	Sep 17	Recitation 4			
Week 5	Sep 20	Lecture 8	Ch 5: Planetary Motion	HW 4	
	Sep 21	Lab	M4 – Circular Motion		
	Sep 22	Lecture 9	Ch 6: Impulse and Linear Momentum		
	Sep 24	Recitation 5			
Week 6	Sep 27	Lecture 10	Ch 7: Work and Energy	HW 5	
	Sep 28	Lab	M5 – Impulse and Momentum		
	Sep 28	Exam 1			
	Sep 29	Lecture 11	Ch 7: Work and Energy		
	Oct 1	Recitation 6			
Week 7	Oct 4	Lecture 12	Ch 7: Power and Collisions	HW 6	
	Oct 5	Lab	M6 – Work and Energy		
	Oct 6	Lecture 13	Ch 7: Extended Objects		

	Oct 8	Recitation 7			
Week 8	Oct 11	October break (no class)		HW 7	
	Oct 12	Lab	No Lab		
	Oct 13	Lecture 14	Ch 9: Rotational Motion		
	Oct 15	Recitation 8			
Week 9	Oct 18	Lecture 15	Ch 9: Angular Momentum	HW 8	
	Oct 19	Lab	M7 – Rotational Motion		
	Oct 20	Lecture 16	Ch 9: Rolling Objects		
	Oct 22	Recitation 9			
Week 10	Oct 25	Lecture 17	Ch 12: Gases	HW 9	
	Oct 26	Lab	Lab Make-up		
	Oct 27	Lecture 18	Ch 12: Gases		
	Oct 29	Recitation 10			
Week 11	Nov 1	Lecture 19	Ch 13: Fluids	HW 10	
	Nov 2	Lab	M8 – Archimedes' Principle		
	Nov 3	Lecture 20	Ch 13: Fluids		
	Nov 5	Recitation 11			
Week 12	Nov 8	Lecture 21	Ch 14: Fluids in Motion	HW 11	
	Nov 9	Lab	Lab Make-up		
	Nov 10	Lecture 22	Ch 14: Fluids in Motion		
	Nov 12	Recitation 12			
Week 13	Nov 15	Lecture 23	Ch 10: Oscillations and Vibrations	HW 12	
	Nov 16	Lab	M9 – Pendulum		
	Nov 16	Exam 2			
	Nov 17	Lecture 24	Ch 11: Waves		
	Nov 19	Recitation 13			
Week 14	Nov 22	Thanksgiving Vacation (no class)			
	Nov 24	Thanksgiving Vacation (no class)			
	Nov 26	Thanksgiving Vacation (no class)			
Week 15	Nov 29	Lecture 25	Ch 15: First Law of Thermodynamics	HW 13	
	Nov 30	Lab	M10 – Standing Waves on Guitar Strings		
	Dec 1	Lecture 26	Ch 16: Second Law of Thermodynamics		
	Dec 3	Recitation 14			
Week 16	Dec 6	No class (due to exam 1)			
	Dec 7	Lab	Lab Make-up		
	Dec 8	No class (due to exam 2)			
	Dec 10	Recitation 15			
Week 17	Dec 13-17	Final Exam			

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