

Fall 2022 Syllabus

PHYS 221: Elements of Physics I (Hybrid Course)

General Information:

Instructor:	Dr. Nau Raj Pokhrel
Office:	214 Nielsen Physics Building, UTK
Email:	npokhrel@utk.edu or, via the Canvas message system
Phone:	(865) 974-5697
Classroom:	Room 415, Nielsen Physics Building
Class Time:	Tuesday from 8:10 AM to 9:25 AM
Office Hours:	Monday & Wednesday from 4:00 PM to 5:00 PM Tuesday from 11:15 AM to 12:15 PM Thursday from 8:00 AM to 9:30 AM Or by email appointment

Communication: The majority of classroom communication will be conducted via the Canvas for this class. To ensure prompt response from me, follow the email policy:

- Please put “**PHYS 221 (Hybrid)**” in the subject line of all course related emails. This practice will help me identify course related emails and respond promptly.
- You can expect delay in responding to emails; I will try to minimize such delays, but do not email me on the evening an assignment is due or before an exam expecting an immediate response. If you don't get response after a couple of days or according to urgency, please resend the email.
- Before emailing me with questions about the course, please ensure that the information is not already provided in the course syllabus or on Canvas.

Course Description & Goals:

Course Overview: Physics 221 is a 4 credit-hour introductory physics course with laboratory. This course covers the introduction to Mechanics, Heat & Thermodynamics, and Wave Motion. The goal is to make you familiar with basic physical principles and applications required in pre-medical, pre-pharmacy and pre-veterinary programs, and give you the skills needed to work with these concepts to solve problems.

Class Structure: This course is taught in a hybrid format. The course is designed to give students an opportunity to direct their own learning. We have one lecture meeting per week for one hour and 15 minutes; and one lab section meeting per week for 2 hours and 30 minutes. Each week, you will be expected to read the course material before the Tuesday class. These full class meetings on Tuesday are not formal lectures, but a discussion of concepts that students are expected to learn outside of class.

Canvas modules consist of online class materials that you are required to study. In the Assignment modules consist of homework assignments (Quiz and Problems), discussion forum and laboratory assessments. All assignments for each module must be completed by the date shown on Canvas or informed during lab sessions. You should use the discussion forum to engage with the instructors and each other.

Prerequisites: The course and text assume you have the background of mathematics. The prerequisite(s) of the course are MATH 125 or MATH 130 or MATH 141 or MATH 151 or MATH 152. Any calculus course is also an appropriate prerequisite.

You will need the following materials for the course:

1. **College Physics, OpenStax e/textbook**
This is an online textbook with spaced practice problems and feedback. You can access this textbook for this class on Canvas under Modules. The College Physics textbook by itself can be found at this Link: ([OpenStax College Physics](#)) and can also be downloaded as a PDF.
2. For the Assignment, you will need **WebAssign OpenStax College Physics 2016**. This is the **inclusive access** content. **You don't need to pay it separately, and you don't need any access code**. For the first-time registration, you can go to any HW link in the assignment module of Canvas and proceed.
3. **Please wait to hear from your TA for the Lab Syllabus and other lab resources details.**
4. **Turning Technologies (Clicker) Registration:** *We will be using the clickers in almost all lectures, so, make sure you have the app, and it is ready by the first class.* Follow the link provided on Canvas Module to register your app. The link is posted on the Modules section as well. Note that **you must use your UTK email ID** to register otherwise your score won't be integrated into Canvas and won't be registered. So, do not use non-UTK email addresses to register your clicker. For instructions in details, visit the UTK OIT website. ([Click Here for the Website Link](#)).

Class Schedule: The following is a class schedule along with lecture topics, assignments etc. This is a tentative schedule; and might differ as our class speed. Any changes, and notices made in the classes/announcements supersede the schedule.

Week of	Week	Chapter	Topics	HW
24-Aug	1		Syllabus/Basic Math Review	
30-Aug	2	-First day of the Class-	Introduction (Units, Physical quantities, Significant figures & approximation)	HW 1

		Meeting-Chapter 1		
06-Sep	3	Chapter 2	Kinematics (Equations of motion Problems, Falling objects, graphical analysis of 1-D motion)	HW 2
13-Sep	4	Chapter 3	2-D Kinematics (Vectors analysis-graphical and analytical, Projectile & problems, Velocity addition)	HW 3
20-Sep	5	Chapter 4/5	Dynamics (Force and Newton's Laws of Motion, Normal, Tension & other forces),	HW 4
27-Sep	6	Chapter 5	Dynamics problem solving, Application of Newton's laws (friction Drag & elasticity)	HW 5
		Chapter 6	Uniform circular motion and Gravitation (angular velocity, acceleration and centripetal force, Newton's law, Kepler's laws))	HW 6
04-Oct	7	Chapter 7/8	Work, Energy, and Power (Work-energy theorem, KE, PE, Conservation of energy, Problems)	HW 7
			Collisions (linear momentum, impulse, and conservation of momentum)	
11-Oct	8	Chapter 8	Collisions (elastic and inelastic collisions, problems); Exam I Review	HW 8
18-Oct	9	Mid-Term Exam I (Chapters 1-7)		
		Chapter 9/10	Statics and Torque (Equilibrium conditions, Stability, Torque problems)	HW 9
01-Nov	10	Chapter 10/11	Rotational Motion & Angular Momentum (Angular kinematics, rotational inertia, rotational KE)	
			Rotational Motion & Angular Momentum (angular momentum, problems)	
08-Nov	11	Chapter 11/12	Fluid Statics (density, pressure, pascal's principle, Archimedes principle)	HW 10
			Fluid Statics problems	HW 11
			Fluid Dynamics & Applications (Flow rate, Bernoulli's equation, Poiseuille's law, viscosity, problems)	
15-Nov	12	Chapter 13/14	Temperature, Kinetic Theory & Gas Laws (Temperature, thermal expansion); Heat and Heat Transfer Methods (heat capacity, Latent heat),	

		Chapter 14/15	Heat Transfer Methods problems; Laws of thermodynamics, Heat engine, Entropy, Stat mech.,	HW 12 (Ch 12-13)
22-Nov	13	Chapter 16	Oscillatory Motion & Waves (Hooke's law, SHM, simple pendulum) Exam II Review	HW 13 (Ch 14)
29-Nov	14	Mid-Term Exam II (Chapters 8-14)		HW 14 (Ch 15)
		Chapter 16/17	Oscillatory Motion & Waves problems; Physics of Hearing (sound, speed & intensity, Doppler effect, interference, and resonance)	HW 15 (Ch 16-17)
06-Dec	15	Course Wrap up, Final Exam Review		Extra Credit HW (Optional)
15-Dec	THU	Final Exam (8:00 AM-10:00 AM); Cumulative (Chapters 1-17)		

Course Repetition Policy: If you are repeating the course, you may not need to repeat the laboratories. Please refer to the Laboratory policy regarding repeating a course and follow instructions there: <http://www.phys.utk.edu/labs/Lab%20Repeat.pdf>

Grading & Evaluation:

Clicker Quizzes & Discussion Participation: In the class meeting, you will be responding quizzes at the end of the lecture. Clicker response grade is divided equally to participation (50%) and the correct response (50%). Your participation in discussion forum on canvas also includes the participation grade.

Homework Assignments: You will be assigned homework on Canvas, and on WebAssign. Please keep on checking Canvas for the HW due dates which could be different than the dates mentioned on the schedule.

Midterm Exams: There will be two mid-term tests. The tentative dates for the midterms are indicated on the schedule. ***Please note that these dates are subject to change as we progress through the course material, but they will be finalized and the details will be announced at least a week prior so that you can plan accordingly.***

Final Exam: The final exam will be given on the day as scheduled by the registrar's office (see the schedule). If you determine that you have a conflict with that time or have three or more exams scheduled on that day, please let me know as soon as possible. The Final Exam

will be two hours in length and cumulative in scope, covering all the course materials discussed in the semester.

A formula-sheet will be available for each exam for a quick reference.

Laboratory: The laboratory sections are mandatory. If you fail the Laboratory section of the course, you will fail the course regardless of your scores in class. Lab reports will be turned in to your Teaching Assistant. Teaching Assistant is responsible for grading them. Please resolve any disputes regarding your laboratory grade with your TA. If you are unable to reconcile the issue, please write to me.

Grading Scheme:

Grades: Your grade is calculated based on many elements of the course. See the table below for details on this.

Course Element	%
Laboratory	22%
Mid Term Exam I	14%
Mid Term Exam II	14%
Final Exam	20%
Homework	20%
In-class Quiz/Discussion Participation	10%
Total	100%

Letter grade will be obtained using the conversion below:

%	Grade
90% and above	A
87% - 89%	A-
83% - 86%	B+
80% - 82%	B
77% - 79%	B-
73% - 76%	C+
70% - 72%	C
67% - 69%	C-

63% - 66%	D+
60% - 62%	D
57% - 59%	D-
< 57%	F

(Note: The instructor reserves the right, when necessary, to alter the grading policy, change examination dates, and modify the syllabus and course content. Modifications will be announced in class. Students are responsible for announced changes.)

Other Information:

Class Rules: Students need to follow the following guidelines and class room etiquette in order to ensure a positive and respectful learning environment for everyone:

- **Arrive to the class on time:** don't make it a habit to join late.
- **Cell Phones/Technology:** Be respectful. Use of electronic devices for academic work is fine but use of electronic devices for other purposes is not. Turn off your cell phones when we are not using them in quizzes. While on the computers social networking is not allowed. Repeated abuse will result in being dismissed from that class and asked to return next week. No credit will be given for such dismissal.
- **Avoid side conversations:** The noise is distracting to other students, and you will impact the learning environment, so avoid private conversations in the classroom.
- **Be respectful:** Act in a matured/polite manner and be respectful of the learning process, your instructor, classroom, and your fellow students. Respect to the learning environment is projected in many ways including your body language e.g., do not put your feet/legs on the back of the seats in front of you.
- **Raise your hand:** If you have a question or comment during the class, please raise your hand.
- **Share the air:** If you have been dominating the discussion or participating disproportionately, let others participate. Alternatively, if you haven't said much, you are encouraged to participate more.
- **Use respectful and socially inclusive language.**

How to succeed and get a good grade in the class: Since this is the Hybrid class, we are meeting once a week for lectures which is not enough to cover all parts of the syllabus in detail. Hence reading assignments and homework assignments are provided. A good portion of success in this class depends on the self-study, coming class to prepared, actively participating during the class, and completing the assigned work.

- Please communicate with me on time if you have any questions so that we can work together for the success.
- Read/review the textbook and Canvas module resources ACTIVELY. Active reading means reading the book with a pen and paper nearby. You should review and recalculate the worked-out examples and problems as you go and be critical of your understanding of the

content. Note any questions that you have so you can ask them during lectures, via email, or during office hours.

- In the class, participate actively and respond to all the clicker questions so you can earn your quiz/participation credit.
- Follow the class rules and behavior etiquette while in the class.
- Complete all the assignments on time.
- Take advantage of all the help you can get, you will need it: Instructor office hours, Lab TAs help, totorihours etc.

Your Feedback/Suggestions on the course: You are encouraged to provide feedback on any aspect of the course all through the semester using any communication method you prefer. Your **grades will not be impacted by any feedback** you provide, they will be purely based on your coursework and lab work. However, your discretion in these matters is expected. You will also have an opportunity to give feedback at the end of the semester through the Course Evaluation System. Your feedback is critical in improving the course. Each year I take the information provided in feedback seriously so please take the time to fill out the feedback forms in a thoughtful manner.

Students with disabilities:

The University of Tennessee, Knoxville, is committed to providing an inclusive learning environment for all students. If you anticipate or experience a barrier in this course due to a chronic health condition, a learning, hearing, neurological, mental health, vision, physical, or other kind of disability, or a temporary injury, you are encouraged to contact Student Disability Services (SDS). An SDS Coordinator will meet with you to develop a plan to ensure you have equitable access to this course. If you are already registered with SDS, please contact your instructor to discuss implementing accommodations included in your course access letter.

Student Disability Services Contact Information:

915 Volunteer Boulevard

100 Dunford Hall

Knoxville, TN 37996

Phone: (865) 974-6087

Fax: (865) 974-9552

Email: sds@utk.edu

Website <https://sds.utk.edu/>

For additional important information (Academic integrity, civility statement, UT alerts, ...) please see the Campus Syllabus [\(Click here to download the Campus Syllabus\)](#).