

# Fall 2022 Syllabus

## PHYS 221: Elements of Physics I

### (Online Course)

#### General Information:

<b>Instructor:</b>	Dr. Nau Raj Pokhrel
<b>Office:</b>	214 Nielsen Physics Building, UTK
<b>Email:</b>	<a href="mailto:npokhrel@utk.edu">npokhrel@utk.edu</a> or, via the Canvas message system
<b>Phone:</b>	(865) 974-5697
<b>Classroom:</b>	Room 415, Nielsen Physics Building
<b>Class:</b>	Asynchronous online
<b>Office Hours:</b>	Monday & Wednesday from 4:00 PM to 5:00 PM (in-person) Tuesday from 11:15 AM to 12:15 PM (in-person) Thursday from 8:00 AM to 9:30 AM (online via Zoom) Or by email appointment
<b>Zoom Link:</b>	Link: <a href="https://tennessee.zoom.us/j/95956839620">https://tennessee.zoom.us/j/95956839620</a>

**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 (Online)**” 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:** There are no formal lectures. Students are expected to complete the online class modules on time. The Canvas modules consist of online class materials that

student are required to study. Also, you need to complete homework assignments, online laboratory, class participation discussion forum, and optional extra credit assignments. All assignments (including labs) for must be completed by the date shown on the front page of Canvas (or as indicated in individual assessment). Links for the submission of all assignments are on Canvas. Students should use the online 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 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. **Lab manual/resources:** Please wait to hear from your TA for the details about the lab resources.

**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 announcements supersede the schedule.

Week of	Week	Chapter	Topics	Quiz	HW
24-Aug	1	Chapter 1	Syllabus/Basic Math Review, Introduction (Units, Physical quantities, Significant figures & approximation)	Quiz 1	HW 1
30-Aug	2	Chapter 2	Kinematics (Equations of motion Problems, Falling objects, graphical analysis of 1-D motion)		
06-Sep	3	Chapter 3	2-D Kinematics (Vectors analysis-graphical and analytical, Projectiles)	Quiz 2	HW 2
13-Sep	4	Chapter 3/4	2-D Kinematics (Projectile problems, Velocity addition); Newton's Laws of Motion	Quiz 3	HW 3
20-Sep	5	Chapter 4	Dynamics (Force and Newton's Laws of Motion, Normal, Tension & other forces),	Quiz 4	HW 4

27-Sep	6	Chapter 5	Dynamics problem solving, Application of Newton's laws (friction Drag & elasticity)	Quiz 5	HW 5
		Chapter 6	Uniform circular motion and Gravitation (angular velocity, acceleration and centripetal force, Newton's law, Kepler's laws)	Quiz 6	HW 6
04-Oct	7	Chapter 7/8	Work, Energy, and Power (Work-energy theorem, KE, PE, Conservation of energy, Problems)	Quiz 7	HW 7
			Collisions (linear momentum, impulse, and conservation of momentum)		
11-Oct	8	Chapter 8	Collisions (elastic and inelastic collisions, problems)	Quiz 8	HW 8
18-Oct	9	<b>Mid-Term Exam I (Chapters 1-7)</b>			
			Chapter 9/10	Statics and Torque (Equilibrium conditions, Stability, Torque problems)	Quiz 9 (Ch 9-10)
01-Nov	10		Rotational Motion & Angular Momentum (Angular kinematics, rotational inertia, rotational KE)		
		Chapter 10/11	Rotational Motion & Angular Momentum (angular momentum, problems)		HW 10
08-Nov	11	Chapter 11/12	Fluid Statics (density, pressure, pascal's principle, Archimedes principle)	Quiz 10 (Ch 11-12)	HW 11
			Fluid Statics problems		
15-Nov	12	Chapter 13/14	Fluid Dynamics & Applications (Flow rate, Bernoulli's equation, Poiseuille's law, viscosity, problems)		
		Chapter 14/15	Temperature, Kinetic Theory & Gas Laws (Temperature, thermal expansion); Heat and Heat Transfer Methods (heat capacity, Latent heat),	Quiz 11 (Ch 13-14)	HW 12 (Ch 12-13)
22-Nov	13	Chapter 16	Heat Transfer Methods problems; Laws of thermodynamics, Heat engine, Entropy, Stat mech.,		HW 13 (Ch 14)
29-Nov	14	<b>Mid-Term Exam II (Chapters 8-14)</b>		Quiz 12	HW 14 (Ch 15)

			(Ch 15)	
		Chapter 16/17	Oscillatory Motion & Waves problems; Physics of Hearing (sound, speed & intensity, Doppler effect, interference and resonance)	Quiz 13 (Ch 16-17) HW 15 (Ch 16-17)
06-eDc	15	Course Wrap up, Final Exam Preparation		Extra Credit HW (Optional)
12-Dec	MON	<b>Final Exam (7:30 AM-6:30 PM); Cumulative (Chapters 1-17)</b>		

**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:

**Reading Quizzes & Discussion Participation:** You will be responding Reading quizzes on Canvas as assigned. You will have **only ONE attempt** for the quizzes. Your participation in discussion forum on canvas also includes the participation grade. Since it is the asynchronous class, I strongly encourage you to participate in discussions.

**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 midterm tests. I will publish them on Canvas on the test days. I will open tests for a few hours window, but you need to complete them within 45 minutes after you open them on Canvas. I will update an announcement on Canvas a couple of days before the tests.

**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%
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:

**How to succeed and get a good grade in the class:** Since this is the Online class, there are no formal lectures and I expect you study yourself, actively participating in discussion meeting with TAs and/or me during office hours, and getting help from the tutorial center either in-person or online via zoom.

- Please communicate with me on time if you have any questions so that we can work together for the success.
- Read the textbook **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 on the discussion forum, via email, or during office hours.
- Follow the online class rules and behavior etiquette.
- 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, tutorial center meeting 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](mailto:sds@utk.edu)

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

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