

Fall 2021 Syllabus

PHYS 221: Elements of Physics I

Course Information:

Instructor:	Dr. Nau Raj Pokhrel
Office:	611 Nielsen Physics Building, UTK
Email:	npokhrel@utk.edu or, via the Canvas message system
Phone:	(865) 974-5697
Classroom:	Nielsen 415
Class Time:	Monday, Wednesday, and Friday from 2:15 to 3:05 PM
Office Hours:	Monday & Wednesday from 3:15 PM to 4:15 PM (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” 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 and Thermodynamics. 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.

Pre/corequisites: 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 131 or MATH 132 or MATH 141 or MATH 151 or MATH 152. Any calculus course is also an appropriate prerequisite.

Resources: 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**. For registering with this, please follow **VitalSource Bookshelf** tab on the left sidebar in Canvas. **This the inclusive access content, you don't need to pay it separately. Also, you don't need any access code.**
3. Contemporary Introductory Physics Experiments, 2nd Edition by James E. Parks, Hayden-

McNeil Publishing, ISBN 978-0-7380-6168-9. **You are required to purchase a current edition of the Laboratory manual. Please wait to hear from your TA for the details about the book and other lab resources.**

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 (<https://utk.teamdynamix.com/TDClient/2277/OIT-Portal/KB/ArticleDet?ID=117398>).

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. We will discuss in the class if there are any changes, and notices made in the classes/announcements supersede the schedule.

PHYS 221 Fall 2021 Class Schedule (MWF 2:15-3:05 PM)

First day of the Class August 18, Wednesday

Day	Week	Chapter	Topics	HW
18-Aug	1	Introduction/ Chapter 1	Syllabus Review/ Introduction (Units,	HW 1
20-Aug			Physical quantities, Significant figures & approximation)	
23-Aug	2	Chapter 2	Kinematics (vectors & scalars, displacement, speed, velocity & acceleration)	HW 2
25-Aug			Kinematics (Equations of motion Problems)	
27-Aug			Kinematics (Falling objects, graphical analysis of 1-D motion)	
30-Aug	3	Chapter 3	2-D Kinematics (Vectors analysis-graphical and analytical, Projectile)	HW 3
1-Sep			2-D Kinematics (Projectile problems, velocity addition)	
3-Sep		Chapter 4	Dynamics (Force and Newton's Laws of Motion)	HW 4
6-Sep	Labor Day	Holiday		
8-Sep	4	Chapter 4	Dynamics (Force and Newton's Laws of Motion)	
10-Sep			Dynamics (Normal, Tension & other forces)	
13-Sep	5	Chapter 5	Dynamics problem solving, Application of Newton's laws	HW 5
15-Sep			Application of Newton's laws (friction Drag & elasticity)	
17-Sep	6	Chapter 6	Uniform circular motion and Gravitation (angular velocity, acceleration, and centripetal force)	HW 6
20-Sep			Uniform circular motion and Gravitation (Newton's law, Kepler's laws)	
22-Sep	6	Chapter 7	Work, Energy, Power (Work-energy theorem, KE, PE)	HW 7
24-Sep			Work, Energy, Power (Conservation of energy, Problems)	
27-Sep	7	Chapter 8	Linear Momentum, Collisions (linear momentum, impulse, and conservation of momentum)	HW 8
29-Sep			Ch 8/ Review	
1-Oct		Fall Break	No Class	
4-Oct	8	Exam I (Chapters 1-7)		

6-Oct		Chapter 8	Linear Momentum, Collisions (elastic and inelastic collisions, problems)	
8-Oct		Chapter 9	Statics and Torque (Equilibrium conditions)	HW 9
11-Oct			Statics and Torque (Stability, Torque problems)	
13-Oct	9	Chapter 10	Rotational Motion & Angular Momentum	
15-Oct			Rotational Motion & Angular Momentum (Angular kinematics, rotational inertia, rotational KE)	HW 10
18-Oct			Rotational Motion & Angular Momentum (angular momentum, problems)	
20-Oct	10	Chapter 11	Fluid Statics (density, pressure, pascal's principle, Archimedes principle)	HW 11
22-Oct			Fluid statics problems	
25-Oct			Fluid Dynamics (flow rate, Bernoulli's equation)	
27-Oct	11	Chapter 12	Fluid Dynamics & Applications (Poiseuille's law, viscosity, problems)	
29-Oct		Chapter 13	Temperature, Kinetic Theory & Gas Laws (Temperature, thermal expansion)	HW 12
1-Nov			Temperature, Kinetic Theory & Gas Laws (Gas Laws, problems)	
3-Nov	12	Chapter 14	Heat and Heat Transfer Methods (heat capacity, Latent heat)	
5-Nov			Heat Transfer Methods; problems	
8-Nov		Chapter 15	Laws of thermodynamics	
10-Nov	13	Ch 15/ Review		HW 13
12-Nov		Exam II (Chapters 8-14)		
15-Nov		Chapter 15	Laws of thermodynamics, Heat engine	HW 14
17-Nov	14		Entropy, Stat mech.	
19-Nov		Chapter 16	Oscillatory Motion & Waves (Hooke's law, SHM, simple pendulum)	
22-Nov			Oscillatory Motion & Waves (SHO, oscillation and waves, superposition of waves, interference)	
24-Nov	15	Chapter 17	Physics of Hearing (sound, speed & intensity)	
26-Nov		Thanksgiving Day	Holiday	
29-Nov	16	Chapter 17	Physics of Hearing (Doppler effect, interference, and resonance)	
1-Dec		Course Wrap-up/ Review		
7-Dec	TUE	Final Exam (10:30am-12:30pm; Cumulative)		

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 midterm 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 at least a week prior so that you can plan accordingly.*** Each midterm exam will be 45 minutes in length.

Final Exam: The final exam will be given on **Tuesday, December 7th from 10:30am to 12:30pm** in classroom (Nielsen 415). 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 chapters 1 to 17 of the textbook.

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	25%
Mid Term 1	15%
Mid Term 2	15%
Final Exam	20%
Homework	15%
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-

(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:

- **Please 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.
- Please use **respectful and (socially) inclusive language.**

How to succeed and get a good grade in the class: The number of lecture hours in this class are not enough to cover all parts of the syllabus in detail. Hence reading assignments and home works are provided. A good portion of success in this class depends on coming class to prepared, actively participating during the class and completing home works as assigned.

- 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 try to re-derive equations as you go and be critical of your understanding of how the book gets from point A to point B. 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, in-class TA help, Lab TAs recitation hours 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:

If you need course adaptations or accommodations because of a documented disability, please contact the Student Disability Services (SDS). This will ensure that you are properly registered for the services provided by ODS. University Policy forbids me from making special accommodations without a letter from the Office of Student Disability Services.

Disability Services Contact Information:

2227 Dunford Hall

Knoxville, TN 37996-4020

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, COVID-19 procedures, ...) please see the Campus Syllabus [\(Click here for Campus Syllabus\)](#).