



## INSTITUTIONAL COURSE SYLLABUS

Course Code: <b>PHY105</b>	Course Title: <b>Physics I</b>
Course Instructor: <b>Dr. Rasha Abumousa</b>	Email: <b>rabumousa@psu.edu.sa</b>
Credit Hours: <b>4</b> (3 theory + 1 lab)	Course Location: <b>Check your schedule</b>
Scheduled Office Hours: <b>10-11 am daily</b>	
Office Location: <b>R-222</b>	
Co-Requisite: None	Pre-Requisite: None
On Campus or Online: On Campus	

### Mission Statement

The Department of Mathematics and Sciences is committed to offering high-quality education to lay a durable foundation for specialized degree programs at PSU. The department empowers students' academic and intellectual development by enhancing their logical thinking and analytical skills. The department adheres to the highest ethical standards and best professional practices committed to supporting the research in different scientific disciplines.

- I. **Course Description:** This course introduces the principles of mechanics, energy, and heat. The course covers physics and measurement, motion in one dimension, vectors, motion in two dimensions, laws of motion, circular motion and other applications of Newton's laws, work and energy, potential energy and conservation of energy, rotational kinematics and torque, temperature, and heat. The emphasis in this course is cultivating an understanding of natural phenomena through direct observation, reasoning, and application of this knowledge.
- II. **Course Learning Outcomes:** On the successful completion of this course, students will be able to demonstrate the following:

Skills	Course Learning Outcomes (CLO)
<b>Knowledge &amp; Understanding</b>	<b>1- Describe</b> basic physical quantities in mechanics and heat
<b>Skills</b>	<b>2- Calculate</b> various physical quantities using translational and rotational kinematical equations and torque. <b>3- Apply</b> Newton's laws of motion to solve various physical problems. <b>4- Solve</b> physical problems using conservation laws.



Prince Sultan University  
College of Humanities and Sciences  
Department of Mathematics and  
Sciences

TLC 2024 Form 12 /Institutional  
Course Syllabus Template

Fall Semester 2024 - 2025

	<p><b>5- Calculate</b> physical parameters associated with the thermal properties of matter.</p> <p><b>6- Demonstrate</b> basic experimental skills by setting up the experiment, carrying out the experimental procedure, and report results properly.</p>
<b>Values</b>	

### III. Tentative Weekly Course Schedule:

WEEK	UNIT/ TOPIC	CLO(s) alignment	STUDENT TASKS	Contact hours
<b>Week 1:</b> 25 Aug - 29 Aug	<b>Ch. 1: Introduction to Physics.</b> Physics and the laws of Nature, Units of Mass, Length and Time, Dimensional analysis, Converting Units <b>Sections:</b> (1.1), (1.2), (1.3), (1.5)	1		3
<b>Week 2:</b> 01 Sep - 05 Sep	<b>Ch. 2: One Dimensional Kinematics.</b> Position, Distance and Displacement, Average Speed and Velocity, Acceleration, Motion with Constant Acceleration, Freely Falling Objects <b>Sections:</b> (2.1), (2.2), (2.4), (2.5), (2.7)	1, 2		3
<b>Week 3:</b> 08 Sep - 12 Sep	<b>Ch. 3: Vectors.</b> Scalars and Vectors, Components of a Vector, Adding and Subtracting vectors, Unit Vectors, Position, Displacement, Velocity, and Acceleration Vectors, (Multiplication of Vectors: Dot and Cross Products). <b>Sections:</b> (3.1), (3.2), (3.3), (3.4), (3.5)	2, 3	HW assignment, Exercises	3
<b>Week 4:</b> 15 Sep - 19 Sep	<b>Ch. 4: Two-dimensional kinematics.</b> Projectile Motion, Zero Launch Angle, General Launch Angle, Key Characteristics. <b>Sections:</b> (4.2), (4.3), (4.4), (4.5)	1, 2	Quiz 1 (Ch. 1+2)	3
<b>Week 5:</b> 22 Sep - 26 Sep	<b>Ch. 5: Newton's Laws of Motion.</b> Force and Mass, Newton's First Law of Motion, Newton's Second Law of Motion, Newton's Third law of Motion, Weight, Normal Forces <b>Sections:</b> (5.1), (5.2), (5.3), (5.4), (5.6), (5.7)	1, 2, 3		3
<b>Week 6:</b> 29 Sep - 03 Oct	Ch. 5 continued	1, 2, 3		3



Prince Sultan University  
College of Humanities and Sciences  
Department of Mathematics and  
Sciences

TLC 2024 Form 12 /Institutional  
Course Syllabus Template

Fall Semester 2024 - 2025

<b>Week 7:</b> 06 Oct - 10 Oct	<b>Ch. 6: Application of Newton's Laws.</b> Frictional Forces, Strings and Springs, Translational Equilibrium, Circular Motion. <b>Sections:</b> (6.1), (6.2), (6.3), (6.5)	1, 2, 3	HW assignment, Exercises	3
<b>Week 8:</b> 13 Oct - 17 Oct	Ch. 6 continued	1, 2, 3	Quiz 2 (Ch. 3+4)	3
<b>Week 9:</b> 20 Oct - 24 Oct	<b>Ch. 7: Work and Kinetic Energy.</b> Work done by a constant Force, Kinetic Energy and Work-Energy Theorem, Work done by a variable force (spring), Power <b>Sections:</b> (7.1), (7.2), (7.3), (7.4)	1, 4	<b>Midterm Exam</b> (Ch. 1-5) (Tue. Oct. 22 <sup>nd</sup> , 12-1 pm)	3
<b>Week 10:</b> 27 Oct - 31 Oct	Ch. 7 continued	1, 4		3
<b>Week 11:</b> 03 Nov - 07 Nov	<b>Ch. 8: Potential Energy and Conservation of Energy.</b> Potential Energy and the Work done by Conservative, Conservation of Mechanical Energy. <b>Sections:</b> (8.2), (8.3)	1, 4		3
<b>Week 12:</b> 10 Nov - 14 Nov	<b>Ch. 9: Linear Momentum and Collision.</b> Linear Momentum, Momentum, and Newton's Second law, Impulse, Conservation of Linear Momentum, Inelastic Collision, Elastic Collision <b>Sections:</b> (9.1), (9.2), (9.3), (9.4), (9.5), (9.6)	1, 4	HW assignment, Exercises	3
<b>Week 13:</b> 17 Nov - 21 Nov	<b>Ch. 10: Rotational Kinematics.</b> Angular Position, Velocity and Acceleration, Connections between Linear and Rotational Quantities <b>Sections:</b> (10.1), (10.3)	1, 2	Quiz 3 (Ch. 7+8)	3
<b>Week 14:</b> 24 Nov - 28 Nov	<b>Ch. 11: Rotational Dynamics and Static Equilibrium.</b> Torque, Zero Torque, and Static Equilibrium <b>Sections:</b> (11.1), (11.3)	1, 2, 3		3
<b>Week 15:</b> 01 Dec - 05 Dec	<b>Ch. 16: Temperature and Heat</b> Temperature and Heat, Temperature Scales, Thermal Expansion, Introduction to Conduction, Convection and Radiation <b>Sections:</b> (16.1), (16.2), (16.3), (16.6)	1, 5		3



Prince Sultan University  
 College of Humanities and Sciences  
 Department of Mathematics and  
 Sciences  
 Fall Semester 2024 - 2025

TLC 2024 Form 12 /Institutional  
 Course Syllabus Template

#### IV. Student Assessment & Teaching Strategies: Assessment Task & Teaching Strategies

Domain	Assessment Task	Teaching Strategy
Knowledge	Quizzes, Midterm Exam, and Final exam	Lectures, Demonstrations, Discussions
Skills	Quizzes, Midterm Exam, Final exam, Lab reports, and Lab exams.	Assignments, Exercises, HW, Lab experiments
Values		

#### V. Course Requirements

1. Midterm exam.
2. Final comprehensive exam.
3. Quizzes
4. Classwork/participation/homework
5. Weekly lab report.
6. Lab final exam (written and practical).

#### VI. Schedule of Assessment

Assessment	Assessment Task	Week Due	Proportion of Final Assessment
1	Homework, class participation, and other activities	Weekly	5%
2	Quizzes	<b>Weeks 4, 8, 13</b> (during class time)	10%
3	Midterm Exam	<b>Week 9</b> <b>(Tue. Oct. 22<sup>nd</sup>, 12-1 pm)</b>	20%
4	Final Comprehensive Exam.	End of semester (check final exams table)	40%
5	Lab Reports	Weekly	10%
6	Lab Final Exam (Practical)	<b>Week 13</b> (at same time of the lab)	10%
7	Lab Final Exam (written)	<b>Week 14</b> <b>(Sat. Nov. 23<sup>rd</sup> at 1 pm)</b>	5%



Prince Sultan University  
College of Humanities and Sciences  
Department of Mathematics and  
Sciences

TLC 2024 Form 12 /Institutional  
Course Syllabus Template

Fall Semester 2024 - 2025

## VII. Learning Resources

### A. References

- **Textbook:** Physics Technology Update by James S. Walker. Fourth Edition, Pearson International Edition, 2014
- **Lab manual:** Physics 1 Lab Manual (Mechanics)
- **Recommended books:**
  - 1- College Physics. By Serway and Vuille. Tenth edition. CENGAGE Learning, 2014
  - 2- College Physics. By Nicholas Giordano. Second edition. CENGAGE Learning, 2013
  - 3- Principles of Physics. By Serway and Jewetts, Fourth Edition, 2005
  - 4- University Physics. By Young and Freedman. Eleventh edition. Person, 2004

### B. Facilities Required

- Classrooms equipped with large screen or projector and PC, internet access.
- Physics lab with lab equipment.

**C. EDU-HUB Platform** – The platform will be used for all online education experiences at PSU. It supports a variety of methods to support the teaching and learning strategies across all disciplines. It also includes the LMS.

**D. Writing and Tutoring Center** – **Students** are highly advised to use the Writing and Tutoring Center’s academic services by booking tutoring/writing appointments through the **booking system:** (<https://psu.mywconline.net/>)

## VIII. Classroom Policies

### A. Academic Integrity Policy (e.g., plagiarism or dishonesty)

“Plagiarism can be defined as unintentionally or deliberately using another person’s writing or ideas as though they are one’s own. Plagiarism includes, but is not limited to, copying another individual’s work and taking credit for it, paraphrasing information from a source without proper documentation, and mixing one’s own words with those of another author without attribution. In addition, buying a paper or project, or downloading a paper from the Internet, and submitting them as your own are also plagiarism. The penalty for academic dishonesty will bring course expulsion and failure, or even suspension” (Academic Integrity and Syllabus Acknowledgement Form).

All students are expected to submit their ‘own’ work and not the work of others.



Prince Sultan University  
College of Humanities and Sciences  
Department of Mathematics and  
Sciences  
Fall Semester 2024 - 2025

TLC 2024 Form 12 /Institutional  
Course Syllabus Template

### **B. Attendance Policy**

Please, adhere to the following guidelines:

1. The University attendance policy will be strictly followed. In this course, the absence of **16 hours** results in a Denied Notice (DN). (Refer to the student regulation handbook for further details.)

**Please Note: IT IS THE SOLE RESPONSIBILITY OF THE STUDENT TO KEEP SATISFYING their level of attendance. Otherwise, a “DN” grade will be granted automatically during any time in the semester without any notice from the e-register system.**

2. No make-up exams will be allowed except for university accepted documents. (Refer to the student regulation handbook for further details.)

### **A. Homework Submission Policy**

- Late submission will not be accepted.