



ATENEO DE MANILA UNIVERSITY

SCHOOL OF SCIENCE AND ENGINEERING

Department of Physics

Course Syllabus for PHYS 10.01 Introductory Physics I

A. COURSE INFORMATION

COURSE NUMBER	Phys 10.01			NO. OF UNITS	3
COURSE TITLE	Introductory Physics I				
PREREQUISITE/S	Taken concurrently with PHYS 10.02				
DEPARTMENT/ PROGRAM	Department of Physics			SCHOOL	School of Science and Engineering
SCHOOL YEAR	2023-2024			SEMESTER	2 nd semester
INSTRUCTOR/S	Christian Lorenz S. Mahinay, Ph.D.				
VENUE	F304	SECTION	CB-J	SCHEDULE	T-F 08:00-09:30

B. COURSE DESCRIPTION

This introductory Physics course is designed for non-science undergraduate students who wish to gain a clear understanding of physics concepts and their applications in our everyday lives. To better appreciate physics as the foundation of all other sciences and engineering, this course emphasizes conceptual understanding with minimal use of mathematics while engaging the students in an active learning approach. The course discusses the following fundamental topics and their many interesting applications: mechanics, matter and atomic structure, heat and thermodynamics, and mechanical and electromagnetic waves.

WHERE IS THE COURSE SITUATED WITHIN THE FORMATION STAGES IN THE FRAMEWORK OF THE LOYOLA SCHOOLS CURRICULA	
X	FOUNDATIONS: Exploring and Equipping the Self
X	ROOTEDNESS: Investigating and Knowing the World
	DEEPENING: Defining the Self in the World

x	LEADERSHIP: Engaging and Transforming the World
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C. COURSE LEARNING OUTCOMES

Alignment of the Course to the Core Curriculum Learning Outcomes
(Please see Appendix A for detailed Core Curriculum Learning Outcomes)

The Ideal Ateneo Graduate: A Person of Conscience Competence Compassion Commitment							
CCLO1	CCLO2	CCLO3	CCLO4	CCLO5	CCLO6	CCLO7	CCLO8
✓	✓	✓					

By the end of this course, students should be able to:

COURSE LEARNING OUTCOMES
<p>CLO1: Explain phenomena observed in everyday life using Physics principles.</p> <p>Knowledge: Explain various basic physics principles.</p> <p>Skills: Predict outcomes of simple activities using Physics principles.</p> <p>Attitudes: Appreciate that simple and complex phenomena of nature are rooted in fundamental physics concepts and that everything is bound by these scientific principles.</p>
<p>CLO2: Discuss significant physics discoveries and technological innovations that influence Philippine society and our greater world today</p> <p>Knowledge: Identify current physics achievements and research being done in the country and in the world.</p> <p>Skills: Determine which basic physics concepts govern these current physics discoveries and innovations.</p> <p>Attitudes: Distinguish physics research which may be relevant to current pressing global or national issues, support advocacies that address these issues, and identify which current physics innovations and concepts are newsworthy.</p>
<p>CLO3: Evaluate information and issues in various spheres of life using scientific reasoning.</p> <p>Knowledge: Determine if a proposed idea or explanation is based on scientific principles.</p> <p>Skill: Determine the scientific method was used in the design and performance of an experiment.</p> <p>Attitude: Appreciate that science cannot explain everything or solve all problems but gives the best results for those that it can.</p>

D. COURSE OUTLINE and LEARNING HOURS

Course Outline	CLOs	Estimated Contact or Learning Hours
The Scientific Enterprise and Life in Motion What are Science and Physics? The Scientific Method Measurement and Estimation Describing moving objects	CLO1-Skills and Attitudes CLO3 – Knowledge, Skills, Attitudes	17 hours
Newton and the Earth's Perpetual Motion What is the Force? Newton's Laws of Motion Momentum and Impulse	CLO1-Knowledge, Skills and Attitudes	17 hours
What Everything is Made of Work, Energy, and Power Matter and Energy The atom Fundamental forces of nature	CLO1-Knowledge, Skills, and Attitudes CLO3-Knowledge and Skills	14 hours
Staying Cool in a Warming World Heat versus Temperature, Specific Heat Heat Transfer Laws of Thermodynamics Earth's Energy Balance	CLO1-Knowledge, Skills, and Attitudes	14 hours
Waves, Oscillations, Sound, and Light Properties of Waves and Wave Classifications Sound versus Light	CLO1-Knowledge, Skills, and Attitudes CLO2-Knowledge, Skills, and Attitudes	14 hours

Nature and Propagation of Light How light propagates through a medium Light as a modern man's tool	CLO3- Knowledge, Skills, and Attitudes	
Electricity and Magnetism Electric Charge, Force, Field, and Potential Sources of Magnetic Fields Magnetic Field vs. Electric Field Magnetic forces	CLO1-Knowledge, Skills, and Attitudes CLO3-Knowledge, Skills, and Attitudes	14 hours

E. ASSESSMENTS AND RUBRICS

Assessment Tasks	Assessment Weight	CLOs
Quizzes	15% (formative or summative)	All CLO's
Long Tests	30% (summative)	All CLO's
Group Activities	20% (summative)	CLO 4
Culminating Activity	15% (formative)	CLO 1 and 2 knowledge and attitudes, and CLO 3 knowledge, skills, and attitude
Final Exam	20% (final summative assessment)	CLO 1 and 2 knowledge and skills

RUBRICS: (for Essay Conceptual Questions in all assessments)

Excellent (A / 100%): The essay is very clear, organized, and well developed. The student's response shows a solid conceptual understanding of physics concepts and can articulate the relationships between physical parameters that are relevant to answering the conceptual question. The language is accurate and precise, and the examples discussed clearly reflect the relevant physics concepts.

Average (B / 85%): The essay is generally clear, focused, and displays some development of ideas that is necessary to discuss the relevant physics concepts. In general, the language is accurate and precise. While the ideas still need further development, the essay can clearly communicate the important concepts.

Fair (C / 70%): The essay is somewhat focused, and the conceptual response needs development. However, the essay still correctly interprets physics concepts relevant to the problem. The language may be somewhat inaccurate and may occasionally have some grammatical errors but the essay is still able to communicate the essential ideas and concepts.

Developing Competence (D / 50%): The essay has at least one correct interpretation of physics concepts needed to address the conceptual question. However, the relationships between physical parameters are not fully understood, and therefore, not clearly articulated. The language may be somewhat inaccurate and may interfere with the reader's ability to fully understand the ideas being conveyed.

Inadequate (F / 20%): The essay does not show any conceptual understanding of physics concepts. It is rambling, unclear, and scientific ideas are underdeveloped. The examples discussed are unrelated or irrelevant to the conceptual question.

Rubrics: Class Presentations

	Content (50 points)	Creativity (25 points)	Novelty (25 points)
90 – 100%	The physics concepts needed to explain the topic are complete and reported properly. Sources that are used are properly cited not just in the references section but during the report as well.	Colorful visuals and/or animations that not only serve aesthetically but aids in the content as well. Only important texts are displayed in the report and the details are explained properly by the reporter. The reporter is very enthusiastic and captures the attention of the audience.	The topic chosen and the physics behind the report are modern and/or unprecedented but are also very interesting to the target audience which is a group of non-physics major students.
75 – 89%	Some physics concepts are missing but are otherwise adequate to present the report. Sources are cited and placed in the references section.	Good visuals and/or animation also aid the reporting of the content. More texts are displayed but other details are otherwise being explained by the reporter. The reporter is enthusiastic but there are some lulls in the report.	The topic chosen is fairly new but quite common but still piques the interests of the audience.
60 – 74%	Most physics concepts are missing, and some that are present are incorrect when explaining the report. Most of the sources are cited properly.	Very basic visuals and animations. A lot of texts are displayed, and the reporter mostly reads off from the presentation. The reporter is not as enthusiastic and is	The topic chosen is already very common but may still be of interest to the audience.

		monotonous when speaking.	
50 – 59%	Most physics concepts are either missing or incorrect and only a few can correctly explain the topics in the report. Only a few sources are properly cited.	Very little to no visuals and/or animations. The report is purely composed of texts that the reporter just reads from. The reporter does not display any enthusiasm toward the report and is not interested in capturing the interest of the audience.	The topic and physics behind are very common and most people are already familiar with them, especially the target audience, and they may not be as interested in listening.

Rubrics: For Problem Solving Assessments

Excellent (5 pts): The solution includes the necessary parts such as the given variables, the missing variable being asked, the equation needed to solve the missing variable, the step-by-step process towards getting the final answer, and the final answer. The solution is clear and is the correct solution to arrive at the final answer. The final answer is encircled or boxed.

Average (4 pts): The solution is missing some parts in the step-by-step process but is still complete and can be easily followed. The solution and final answer are still correct and fairly complete. The final answer is correct and is boxed and encircled.

Fair (3 pts): The solution is missing critical parts such as the given variables and/or the needed equation but the step-by-step process is still complete and sound. Some steps leading to the final answer may have been skipped but it is otherwise understood as to how the answer arrived. The final answer is correct and is boxed and encircled.

Developing Competence (2 pts): The solution is missing most parts but can still be followed. The needed equation is correctly used but the solution may be somewhat inaccurate and is missing some critical steps. The final answer may be incomplete or incorrect due to some small errors, but the solution is still fairly sound.

Inadequate (0-1 pt): The solution and final answer are both incorrect, incoherent, and are not close to the actual solution needed to get the answer.

F. TEACHING and LEARNING METHODS

TEACHING & LEARNING METHODS and ACTIVITIES	CLOs
Weekly lectures (The instructor lectures the class on the chosen topics of the day)	All CLO's
Quizzes (Canvas Quizzes given to test the understanding of the discussions posted online or in the synchronous sessions)	CLO 1-3 Knowledge and Skills
Long test (There are tests that cover 1 or 2 modules which test the knowledge and skills obtained by the student as they go through the	All CLO's

specific modules)	
Culminating Activity (This is the final activity which is shared with PHYS 10.02. This is a final project done by groups assigned in the lab class that gives an overall formative assessment of the class)	CLO 1-3 Knowledge and Attitudes
Final Exam (This is the final comprehensive assessment that tests the knowledge and skills of the students acquired through the entirety of the course)	CLO 1-3 Knowledge and Skills

G. DEADLINES FOR COURSE REQUIREMENTS

Long Tests are to be announced a week before the actual test

The Culminating Activity and peer evaluation will be submitted on **May 6-8, 2024** depending on the deadline set by your laboratory instructor.

The Final Exam will be announced on a later date two weeks before the actual exam

H. PRIMARY REFERENCE:

1. Hewitt, P.G., 2014. Conceptual Physics, 12th edition, Pearson Education Limited, London, England.
2. Hill, J. W., McCreary, T. W., Kolb, D. K. 2013. Chemistry for Changing Times, 13th edition, Pearson Education, Inc., Singapore.
3. McLelland, C.V. The Nature of Science and the Scientific Method. The Geological Society of America. 2006.

I. RECOMMENDED READINGS

1. Giancoli, D.C. 2013. Physics: Principles and Applications, 6th edition, Pearson Education, Inc. Saddle River, NJ, USA.
2. Glover, F. and Sugon, Jr. Q. 2017. An Introduction to Physics. C&E Publishing, Quezon City, Philippines.
3. Serway, R.A. and J. W. Jewett. 2013. Physics for Scientists and Engineers, 9th edition, Brooks/Cole, Boston, MA, USA
4. Young, H. D., Freedman, R. A. 2015, University Physics with Modern Physics, 14th Edition, Pearson Education
5. Environmental applications discussed in class are discussed in detail in: David, A. *et al.*, 2005. *Introduction to Environmental Science: Managing Resources for Sustainability*. Edited by E.Q. Espiritu. Office of Research and Publications, Ateneo de Manila University.

J. GRADING SYSTEM

Final Grade	Letter Grade
92-100	A
86-91	B+
77-85	B
69-76	C+
60-68	C
50-59	D

K. SCHEDULE OF CLASSES

Tuesdays and Fridays 8:00 AM – 9:30 AM

L. CLASS POLICIES

1. The official learning management system for this course will be Canvas.
2. Only students who are officially enrolled will be included in the Canvas class.
3. Only students who are officially enrolled will be allowed to take assessments.
4. Students who require support for Canvas may seek help by sending an email to ls.one@ateneo.edu or chatting with LS-One through that account using their obf email.
5. Student access to the Canvas course will be closed a week after the electronic release of grades for the first quarter. Students are encouraged to download the course materials as well as the records of their grades before the Canvas course closes.
6. Grades reflected on Canvas are not necessarily the official grades for the class.
7. Students with no or very unstable internet connection are advised to immediately inform (by email or through a phone call) (a) their Chair/ Program Director, (b) ls.one@ateneo.edu, and (c) me so that the appropriate assistance can be extended, and adjustments can be made. If necessary, portable learning packets which can be in the form of flash drives or printed materials can be sent to the students.
8. Classes are primarily onsite unless otherwise announced at least a day beforehand due to emergency or unforeseen circumstances.
9. Keeping cameras open during a synchronous session is not required especially if there are connectivity issues but it is highly recommended to keep them open so that I may see you during these sessions.
10. For online and flex classes: A recording of synchronous sessions will be uploaded to the class Google Drive at least a day after the synchronous session. The class beadle and co-beadle should remind me to record the session and upload the session in the class Google Drive (or if Zoom allows it, for them to ask me to make them co-hosts so that they can record the session themselves)
11. Students are only allowed six (6) total absences whether online or onsite. If a student exceeds this number of absences, he/she will automatically receive a grade of **W**. For valid reasons, a make-up long exam/quiz will be given for the missed exam during an absence.
12. Students may communicate with me using my email address found below or using the message function in Canvas which I prefer. You may send in your messages anytime and expect a reply within 1 to 2 days.
13. Always bring your scientific calculator. No borrowing and/or lending of calculators, especially during exams. Mobile phones and other gadgets cannot be used as a substitute for calculators.
14. Under no circumstances shall make-up projects or extra work be given to compensate for your grades due to lack of performance during the semester. The course requirements already provide ample opportunity for students to get good grades. Bonus activities will be given solely under the discretion of the teacher and a student cannot request this.
15. Academic dishonesty (cheating, forgery, plagiarism, etc.) is a serious offense in the academic discipline. Based on LS Student Handbook, cheating in any major course requirement (those that constitute 20% or more of the final grade in the course) will merit an academic penalty of F in the course and will be regarded as a major disciplinary offense. On the other hand, cheating in any other course requirement will merit a minimum

academic penalty of F in that academic requirement, and will be subjected to the usual review befitting a disciplinary case.

M. CONSULTATION HOURS

Email address: cmahinay@ateneo.edu

Office address: Faura Hall, F103

Tuesdays and Fridays, 10 – 12 NN. Please contact me beforehand if you need to schedule a consultation. Other days and times may also be considered depending on my availability but only during office hours. Just send me a message first to confirm.

N. ADDITIONAL NOTES

1. Ateneo de Manila University does not discriminate on the basis of sex, gender, marital or parental status, sexual orientation, or gender identity or expression. See the following link for more information on the LS Gender Policy: <http://www.ateneo.edu/ls/ls-gender-policy>
2. If there are any current or emergent circumstances that make online learning difficult for you, I would appreciate it if you inform me right away.
3. Students are encouraged to use the chat function at any time during the synchronous session (and not just when I ask if there are questions). This gives me a sense of what you're thinking and what your reactions are. In a face-to-face situation, teachers prefer students (to recite but) not to chat in class but in an online environment, chat is preferred. Students are also encouraged to reply to each other's chat messages

Appendix A: Core Curriculum Learning Outcomes (CCLOs)

LEGEND:	
CCLO 1	Demonstrate effective communication skills (listening and speaking, reading and writing) in English and Filipino.
CCLO 2	Evaluate information and issues in various spheres of life using mathematical reasoning and statistical tools to process and manage data.
CCLO 3	Propose ways to address pressing social and ecological problems using appropriate critical approaches and scientific thinking
CCLO 4	Develop a creative and moral imagination that is responsive to contemporary global realities and challenges, but also deeply rooted in local histories, conditions, norms, and institutions.
CCLO 5	Internalize the significance and value of her/ his unique existence and purpose in life in light of Christian faith.
CCLO 6	Discern life choices with a keen awareness of ethical dilemmas and considerations.
CCLO 7	Exemplify a commitment to enhancing human life and dignity, especially those who are excluded and in greatest need.
CCLO 8	Practice a vision of leadership and committed citizenship rooted in Christian humanism.