PHY 101: Introduction to Physics (2024 Spring)

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Arizona State University

PHY 101: Introduction to Physics

Course and Faculty Information

Course Description:

The goal of *PHY101 Introduction to Physics* is to provide students with a broad overview of fundamental physics concepts: Mechanics, Gravitation, Thermal Phenomena, Electricity and Magnetism, Light, Atomic Physics and Relativity. A more detailed description is given below.

This course is a lecture and a lab. Students will learn the role of physics as a fundamental science and how to carry out simple experiments that demonstrate the application of the laws of physics.

This is a 3 credit course.

Course Access:

Your ASU courses can be accessed by both **my.asu.edu (http://my.asu.edu)** and asu.instructure.com; bookmark both in the event that one site is down.

Instructor Contact:

Instructor: Stephanie Moyerman

Email: Via the canvas messaging system.

Office Hours: By appointment

Accessing Course Materials:

- Your course access code should have been emailed to you 2 weeks prior to the start of this course. Please check your email for an email from BryteWave.
- You should be able to log into the Pearson Course from the "Pearson Access" link on the left hand side. From here, you will gain access to course materials by using your access code.
  - If you do not have an access code, you should contact ASU for one as it comes with course registration. Do not worry, you can still register for a 14-day trial to keep up with course work.

Technical Support:

For technical support, use the Help icon in the black global navigation menu in your Canvas course or call the ASU Help Desk at 1+(855) 278-5080. Representatives are available to assist you 24 hours a day, 7 days a week.

Prerequisites:

Basic algebra and trigonometry are required.

Previous experience with physics is not required, though the course assumes familiarity with basic science concepts: measurements, the structure of the solar system, and basic atomic theory.

Requirements:

1. A computer with internet access and each of the following:
   - Web browsers (**Chrome (https://www.google.com/chrome)**, **Mozilla Firefox (http://www.mozilla.org/en-US/firefox/new/)**, or **Safari (http://www.apple.com/safari/)**)
   - **Adobe Acrobat Reader (http://get.adobe.com/reader/)** (free)

- Webcam, microphone, headset/earbuds, and speaker
- Microsoft Office (**Microsoft 365 is free** (https://myapps.asu.edu/app/microsoft-office-2016-home-usage) for all currently-enrolled ASU students)
- Reliable broadband internet connection (DSL or cable) to stream videos.

Note: A smartphone, iPad, Chromebook, etc. will not be sufficient for completing your work in ASU Online courses. While you will be able to access course content with mobile devices, you must use a computer for all assignments, quizzes, and virtual labs.

2. Textbook: Students will have to purchase the e-text version of the book. Please see the registration instructions in the first module of the course.

Modified Mastering Physics for Conceptual Physics 13th Edition
Author(s):
Hewitt, Paul
Textbook ISBN-13: 9780321908605

Grading

Grades are determined based on total course points according to the table below. Only A, B, C, D, and F grades are possible. There are no +/- grades.

Grade	Points Range	Percentage Range
A	825-950	>86.8%
B	700-825	>73.7%
C	600-700	>63.2%
D	475-600	>50.0%
E	Less than 475	<50.0%

Canvas keeps an automated running track of total score throughout the course and tries to guess a grade based on completed assignments. The running total is correct, but **DO NOT** rely on the interpolated grade as it is often **INCORRECT**. Your final grade is based on the total points according to the table above.

Note: There are more than 950 total available (981 total points as well as xx extra credit points):

Different Components	Total Points
Homework	344
Lab activities	322
Exams	315

There are 14 homework assignments, 7 lab assignments and quizzes, a midterm, and a final.

Content and Homework

Homework is assigned for each chapter and can be accessed by clicking "Pearson Access" on the left side tab. You will complete your homework in My Learning through Pearson. Grades will be synced with the Canvas system.

- Homework is graded individually, but you are encouraged to collaborate.
- Each homework has a suggested due date and extension window. There is **no penalty** for late submission during the extension window.
- You can use 6 attempts to answer numerical questions with no penalty.
- Multiple choice questions have a deduction for incorrect answers.

Module 1. Mechanics

Unit 1. Chapter 1. About Science

Unit 2. Chapter 2. Newton's First Law of Motion-Inertia

Unit 3. Chapter 3. Linear Motion

Module 2. Mechanics II

Unit 4. Chapter 4. Newton's Second Law of Motion

Unit 5. Chapter 7. Energy

Unit 6. Chapter 9. Gravity

Module 3. Thermal Phenomena

Unit 7. Chapter 15. Temperature, Heat and Expansion

Unit 8. Chapter 16. Heat Transfer

Module 4. Electricity and Magnetism

Unit 9. Chapter 22. Electrostatics

Unit 10. Chapter 24. Magnetism

Module 5. Light

Unit 11. Chapter 26. Properties of Light

Unit 12. Chapter 31. Light quanta

Module 6. Modern Physics

Unit 13. Chapter 32. The Atom and the Quantum

Unit 14. Chapter 35. Special Theory of Relativity

Labs

There is at least one lab associated with each module. Each lab has two parts, a lab report and a quiz.

- Lab report structure and requirements are given in each lab procedure document.
- Lab reports must be submitted through Canvas.
- Labs must be submitted individually, but you are encouraged to collaborate.
- Labs are worth 30 points each and are graded pass/fail.
- Labs have a suggested submission date and extension window. There is **no penalty** for late submission during the extension window.
- Failed lab reports can be resubmitted within the extension window.

Some labs require physical materials. It is likely helpful to round these up in advance, so they are given below.

- **Lab 1**: Ruler, Tape Measure, Cardboard Box, Sharp Tip, Light Source (optional: string and tape)
- **Lab 2**: Ruler, Rubber Bands, Paper Clips, Ziploc Bags (optional: thumbtacks or pushpins)
- **Lab 3**: 2 coins of 2 denominations each, 2 sheets of paper
- **Lab 4**: N/A (online lab)
- **Lab 5**: String and Ruler (optional: hanger or thumbtack, paper)
- **Lab 6**: Plastic balloons, string, pieces of paper, empty aluminum cans
- **Lab 7**: N/A (online lab)
- **Lab 8**: N/A (online lab)

In addition, for each lab will need two things:

1. A phone/camera for capturing your experiment
2. A lab notebook/computer for recording your data and notes

Lectures

Each chapter has an accompanying summary lecture that discusses key points from each chapter. These lectures come in 2 forms:

Video: Plays the narrated slides. Download the slides and use powerpoint to display them to more easily navigate the content.

Narrated Powerpoint: Uses a voice-over and includes writing and drawing on the slides.

Note that the textbook is the key source and you can expect homework to deal with topics that appear in the text even though they are not mentioned in the slides/video.

Exams

There will be two exams: a midterm and a final.

Midterm - Due March 4 23:59 Phoenix Time. Available from February 25 00:01 to March 4 23:59, Phoenix time. This is a long window for those who choose to take their exam in advance of fall break or over fall break, as well as offer fall break as a catch up/study opportunity for others.

Final - Due April 21 23:59 Phoenix Time. Available from April 21 to April 29 23:59. There will be no extensions granted for this exam.

The midterm covers the first two lecture modules and first lab module. The final covers the rest of the course material.

- Each exam is worth 150 points.
- Each exam has roughly 30 questions with 75 minutes for completion.

- Each exam contains multiple choice questions and numerical value answer questions.
- You are permitted and encouraged to use a calculator on exams.
- A set of equations will be provided before the exam that you may use during the exam.
- **No other notes or materials are permitted during the exam.**
- Exams questions will be similar to homework, recorded example, and lab activity/quiz questions.

You will need to run RPNow in order to take the exams. If you have trouble installing or running the program, you can contact the ASU Help Desk at (480) 965-6500 or 1-855-278-5080. Make sure you download it well before you have to take exams in case there are any problems.

Student Success

To be successful:

- check the course daily
- read announcements
- read and respond to course email messages as needed
- complete assignments by the due dates specified
- communicate regularly with your instructor and peers
- create a study and/or assignment schedule to stay on track

Targets for Grades

Each graded component of the course presents different difficulties. Even though the points for each component are similar, they should be approached differently. The homework and labs can be challenging but you should be able to obtain very good grades through study, collaboration, and seeking help when needed. The exams will be more challenging due to the accumulation of material, and the natural time limit of tests. Exams will not be “curved”.

For students seeking to get an A on the course, the following approach is recommended:

1. Obtain all the points from the homework. Missing a few points, answering incorrectly 1/25 questions in a homework would be acceptable. This target is very feasible. This would give you about 330 points towards the final grade.
2. Obtain all the points from lab activities. This is also very feasible given the pass/fail structure of the lab grade. This would give you 210 points.
3. Obtain a 50% or greater score on the lab quizzes. This would give you 56 points (or more).
4. Obtain a score of 75% or better in the exams. This would give you 236 points (or more).

In this scenario a student would obtain 832 points total and receive an A grade. Note how securing the homework points leads to lower requirements for exam scores.

A student obtaining perfect scores in exams (315 points) would fail the class if, for example, skips doing the homework (0 points), skips two of the labs (60 points), and misses all of the lab quizzes (112 points). The final points are 465.

Note that many students are accustomed to consider their grades as the result of combing letter grades from individual components of the course: get an A in exams and a B in homework and a B in labs leading to some final letter grader (a B?). In this course there are no letter grades associated with partial components and this procedure is discouraged as targets for homework and labs are high.

Late or Missed Assignments

Notify the instructor **BEFORE** an assignment is due if an urgent situation arises and you are unable to submit the assignment on time.

Follow the appropriate University policies to request an **accommodation for religious practices** (http://www.asu.edu/aad/manuals/acd/acd304-04.html) or to accommodate a missed assignment **due to University-sanctioned activities** (http://www.asu.edu/aad/manuals/acd/acd304-02.html) .

All elements of the course have due dates. Except for exams, there is not direct penalty for completing work late. Some assignments will not be accepted after a long grace period. In addition, lateness and completing work at the last moment have consequences.

Technical issues at exam time can sometimes result in students retaking an exam later on. However, taken the exam in the last few hours available, might result in you not qualifying for such opportunity.

Communicating With the Instructor

Community Forum

This course uses a discussion topic called "Community Forum" for general questions and comments about the course. Prior to posting a question or comment, check the syllabus, announcements, and existing posts to ensure it's not redundant. You are encouraged to respond to the questions of your classmates.

Email questions of a personal nature to your instructor. You can expect a response within 72 hours.

Chat

The Chat tool in Canvas allows students and teachers to interact in real time. Use Chat only for informal course-related conversations unless your instructor informs you otherwise. Chat is not ideal for questions about assignments; instructors are not required to monitor it and conversations may be buried or lost.

Email

ASU email is an **official means of communication (http://www.asu.edu/aad/manuals/ssm/ssm107-03.html)** among students, faculty, and staff. Students are expected to read and act upon email in a timely fashion. Students bear the responsibility of missed messages and should check their ASU-assigned email regularly.

All instructor correspondence will be sent to your ASU email account.

Accessibility Statements

View the **Accessibility section (https://canvas.asu.edu/courses/177663/pages/asu-online-student-accessibility-information)** to review accessibility statements for common tools and resources used in ASU Online courses.

If any other tools are used in this course, links to the accessibility statements will be listed below this sentence.

New College Information

Please see the attached document.

Fall_2020_NCIAS_info.doc (https://canvas.asu.edu/api/v1/canvadoc_session?blob=%7B%22moderated_grading_whitelist%22:null,%22enable_annotations%22:null,%22enrollment_type%22:null,%22anonymous_instructor_annotations%22:n

Syllabus Disclaimer

The syllabus is a statement of intent and serves as an implicit agreement between the instructor and the student. Every effort will be made to avoid changing the course schedule but the possibility exists that unforeseen events will make syllabus changes necessary. Remember to check your ASU email and the course site often.

Course Summary:

Date	Details	Due
Mon Jan 8, 2024	**Introduction to MasteringPhysics for Conceptual Physics** (https://canvas.asu.edu/courses/177663/assignments/4837462)	due by 8:59pm
Thu Jan 11, 2024	**Syllabus Quiz** (https://canvas.asu.edu/courses/177663/assignments/4837432)	due by 11:59pm
Fri Jan 19, 2024	**Lab 2: Forces** (https://canvas.asu.edu/courses/177663/assignments/4837464)	due by 11:59pm
	Quiz Lab 2: Forces (https://canvas.asu.edu/courses/177663/assignments/4837437)	due by 11:59pm
Mon Jan 22, 2024	**HW_01 Chapter 1** (https://canvas.asu.edu/courses/177663/assignments/4837448)	due by 9:59pm
	HW_02 Chapter 2 (https://canvas.asu.edu/courses/177663/assignments/4837449)	due by 9:59pm
	Lab 1: Measure the Sun (Extra Credit) (https://canvas.asu.edu/courses/177663/assignments/4837463)	due by 11:59pm

Date	Details	Due
Fri Jan 26, 2024	Lab 3: Free Fall (https://canvas.asu.edu/courses/177663/assignments/4837465)	due by 11:59pm
	Quiz Lab 3: Free Fall (https://canvas.asu.edu/courses/177663/assignments/4837439)	due by 11:59pm
Mon Jan 29, 2024	HW_03 Chapter 3 (https://canvas.asu.edu/courses/177663/assignments/4837450)	due by 9:59pm
Fri Feb 2, 2024	Lab 4: Newton's Laws (https://canvas.asu.edu/courses/177663/assignments/4837466)	due by 11:59pm
	Quiz Lab 4: Newton's Laws (https://canvas.asu.edu/courses/177663/assignments/4837441)	due by 11:59pm
Mon Feb 5, 2024	HW_04 Chapter 4 (https://canvas.asu.edu/courses/177663/assignments/4837451)	due by 9:59pm
Mon Feb 12, 2024	HW_05 Chapter 7 (https://canvas.asu.edu/courses/177663/assignments/4837452)	due by 9:59pm
Mon Feb 19, 2024	HW_06 Chapter 9 (https://canvas.asu.edu/courses/177663/assignments/4837453)	due by 9:59pm
Wed Feb 28, 2024	HW_07 Chapter 15 (https://canvas.asu.edu/courses/177663/assignments/4837454)	due by 9:59pm
Fri Mar 1, 2024	Lab 5: Energy (https://canvas.asu.edu/courses/177663/assignments/4837467)	due by 11:59pm
	Quiz Lab 5: Energy (https://canvas.asu.edu/courses/177663/assignments/4837440)	due by 11:59pm
Mon Mar 4, 2024	HW_08 Chapter 16 (https://canvas.asu.edu/courses/177663/assignments/4837455)	due by 9:59pm
	Exam 1 (https://canvas.asu.edu/courses/177663/assignments/4837433)	due by 11:59pm
Fri Mar 8, 2024	Lab 6: Electrostatics (https://canvas.asu.edu/courses/177663/assignments/4837468)	due by 11:59pm
	Quiz Lab 6: Electricity (https://canvas.asu.edu/courses/177663/assignments/4837438)	due by 11:59pm
Mon Mar 11, 2024	HW_09 Chapter 22 (https://canvas.asu.edu/courses/177663/assignments/4837456)	due by 9:59pm
Mon Mar 18, 2024	HW_10 Chapter 24 (https://canvas.asu.edu/courses/177663/assignments/4837457)	due by 9:59pm
Fri Mar 22, 2024	Lab 7: Greenhouse effect (https://canvas.asu.edu/courses/177663/assignments/4837469)	due by 11:59pm
	Quiz Lab 7: Greenhouse (https://canvas.asu.edu/courses/177663/assignments/4837434)	due by 11:59pm
Mon Mar 25, 2024	HW_11 Chapter 26 (https://canvas.asu.edu/courses/177663/assignments/4837458)	due by 9:59pm
Mon Apr 1, 2024	HW_12 Chapter 31 (https://canvas.asu.edu/courses/177663/assignments/4837459)	due by 9:59pm

Date	Details	Due
Fri Apr 5, 2024	Lab 8: Rutherford's experiment (https://canvas.asu.edu/courses/177663/assignments/4837470)	due by 11:59pm
	Quiz Lab 8: Rutherford (https://canvas.asu.edu/courses/177663/assignments/4837435)	due by 11:59pm
Mon Apr 8, 2024	HW_13 Chapter 32 (https://canvas.asu.edu/courses/177663/assignments/4837460)	due by 9:59pm
Tue Apr 23, 2024	HW_14 Chapter 35 (https://canvas.asu.edu/courses/177663/assignments/4837461)	due by 9:59pm
Mon Apr 29, 2024	Exam 2 (https://canvas.asu.edu/courses/177663/assignments/4837436)	due by 11:59pm
	Module 1: Discussion (https://canvas.asu.edu/courses/177663/assignments/4837442)	
	Module 2: Discussion (https://canvas.asu.edu/courses/177663/assignments/4837443)	
	Module 3: Discussion (https://canvas.asu.edu/courses/177663/assignments/4837444)	
	Module 4: Discussion (https://canvas.asu.edu/courses/177663/assignments/4837445)	
	Module 5: Discussion (https://canvas.asu.edu/courses/177663/assignments/4837446)	
	Module 6: Discussion (https://canvas.asu.edu/courses/177663/assignments/4837447)	