PHY 241: University Physics III

Course and Faculty Information

Course Description: This course provides an introduction to thermodynamics, kinetic theory, physical and wave optics, relativity, photons, matter waves, atomic physics. This course builds on knowledge of mechanics and electric and magnetic fields. It presents principles of physics and topics that are important for a modern education in a science/engineering curriculum.

Credits: 3

Prerequisites:

- PHY 131
- MAT 266 or MAT 271 with C or better; PHY 121 with C or better; Pre/Co-requisite: MAT 267 or MAT 272 with C or better if completed.
- Students are required to have passed the previous course, PHY-131: University Physics II. For PHY 131 and PHY 241, a strong background in calculus is necessary as well as familiarity with vectors and trigonometry.

Instructor: Professor Robert J. Nemanich

Contact Info:

- Office: PSB-353, (Bateman Physical Science Complex wing B, floor 3, room 353)
- Phone: 480-965-2240
- Email address: Robert.Nemanich@asu.edu
- Office Hours: 9:00-10:00 am Tues. (or to be arranged via email)

Course Learning Outcomes

At the completion of this course, students will be able to:

- Understand how work, heat and energy is transformed into each other and transferred.
- Understand macroscopic thermodynamic properties of solids, liquids and gases in terms of the microscopic motion of atoms and molecules.
- Understand the principle of superposition, and how it leads to interference, diffraction and standing waves in string waves, sound waves and light waves.
- Understand the principles of relativity: the speed of light is constant and all the laws of physics are the same in all inertial frames of reference.

- Apply the principles of relativity to solve problems of time dilation and length contraction.
- Understand rest energy, kinetic energy and the conversion of mass and energy.
- Understand that photons have quantized energy and are emitted and adsorbed in an all-or-nothing basis.
- Understand quantized levels in atoms and light emission and absorption.
- Understand the wave nature of matter and the uncertainty principle.
- Understand the wave function as related to probability density fror quantum systems.
- Apply Schrodinger's equation to understand the wave function for some one dimensional systems.

Textbooks/Materials

Title: Physics for Scientists and Engineers **with Modern Physics**
Author: Randall D. Knight
Publisher: Pearson, 4th Edition

Homework, and Practice Tests: are online with MasteringPhysics. Students must have an account with this system from the very first day of classes.

A scientific calculator is required for homework and tests**.**

To sign up for ACCESS MyLab/ Mastering & e-Book:

1. Click on the "**BRYTEWAVE Course Materials**" tab in this Canvas shell.

2. Copy the access code.

3. Go to the "**Access Pearson**" tab in this Canvas shell and log into your Pearson MyLab/Mastering Account, (or create a new one if you do not have one.)

3. Paste the access code into the appropriate box in the "**Access Pearson**" tab. You can now access all your course materials and the e-Book.

Please note: the e-Book won't appear on your shelf until approximately 5 days prior to the start of classes. If you need assistance accessing the book or the opt-out portal, please fill out the support request form: https://forms.gle/uD4GhBxMoixnbwYx5.

The required material for this course will be provisioned as an e-book and made available at a discounted price significantly cheaper than if purchased directly from the publisher. If you wish to take advantage of this discounted group price, no additional action is needed. NOTE: Following the drop/add period, a charge of $38.00, plus tax, will post to your student account under the header "Digital Integrated Course Mtrl" and your access will continue uninterrupted.

IF you'd rather purchase the material from an alternate source, you may choose to opt out of the program by using this link: https://includedcp.follett.com/1230. *. Enter your ASU e-mail address AS IT APPEARS IN THE ASU DIRECTORY (http://asu.edu/directory.), then follow the instructions provided. Be aware that if you do opt-out, your access to the e-book will be discontinued.

Course Access

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

Computer Requirements

This is a fully online course; therefore, it requires a computer with internet access and the following technologies:

- Web browsers (Chrome .)
- Adobe Acrobat Reader . (free)
- Webcam, microphone, headset/earbuds, and speaker
- Microsoft Office (Microsoft 365 is free . 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.

Help

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.

Technical Specifications

- PC Users: A well-working computer running Windows XP or higher with 1024 MB of RAM or higher.
- Mac Users: A well-working computer running Mac OS X or higher.
- A web cam with 640x480 video pixel resolution (web cams built into laptops or monitors are acceptable).
- Headphones or working speakers connected to the computer.
- A microphone connected to the computer (your web cam or laptop may already have one built into it).
- A reliable high speed internet connection (minimum 768 Kbps/384 Kbps Download/Upload).
- A web browser with Adobe Flash Player installed.

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
- access ASU Online Student Resources .

Grading

Your grade will be determined based on the following grading schema:

Grade	Percentage
A+	97.0 – 100%
A	92.0 – 96.99%
A-	87.0 – 91.99%
B+	82.0 – 86.99%
B	77.0 - 81.99%
B-	72.0 - 76.99%
C+	68.0 - 71.99%
C	63.0 - 67.99%
D	55.0 - 62.99%

Grading Procedure

The final grade will be determined from the homework assignments (30%), tests (40%), and the final exam (30%).

- **Homework (30%)**: There will be a total of thirteen (13) assignments, one per each chapter, which will all count towards your final grade. Scores from the Mastering Tutorial and practice tests will be added to homework points without increasing the total possible. The maximum score including extra credit can be no more the 100%.

- Late homework within 24 hrs of the submission deadline will receive a 25% deduction. Late homework submitted more than 24 hrs after the submission deadline and before the final exam day will receive a 50% deduction.
- **Tests (40%):** There will be three mid-term tests (through Canvas). **All tests/exams will be in the Physics Testing Center (PSH 563). An equation sheet will be provided for each test.**
- **Final Exam (30%) The Final will be in the Physics Testing Center (PSH563). A comprehensive equation sheet will be provided.**
- **Course Grade:** Total Percent = (0.30 x Final Exam) + (0.40 x Test Average) + (0.30 x Homework percent) (note: tests are corrected to 100 pts maximum before averaging, homework percent includes extra points but is limited to no more than 100%).

Submitting Assignments

All assignments, unless otherwise announced, MUST be submitted to the designated area of Canvas. Do not submit an assignment via email.

Assignment due dates follow Arizona Standard time. Click the following link to access the Time Converter . to ensure you account for the difference in Time Zones. Note: Arizona does not observe daylight savings time.

Grading Procedure

Grades reflect your performance on assignments and adherence to deadlines. Grades on assignments will be available within 72 hours of the due date in the Gradebook.

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 . or to accommodate a missed assignment due to University-sanctioned activities .

Activities used for instruction include video lectures, textbook readings,
and online discussions. Assessment is based on homework assignments, tests, and a final exam.

Course Topics & Schedule

Activities used for instruction include video lectures, textbook readings, and online discussions. Assessment is based on homework assignments, tests, and a final exam.

PSY 241 Spring 2024 Session C

	Date	Day	Readings/Assignments/Tests
Week 1			(1/8 - 1/12)
	8-Jan	Mon	Course starts
			Ch 18: A Macroscopic Description of Matter
	11-Jan	Thurs	Mastering Tutorial
Week 2			(1/16 - 1/19)
	16-Jan	Tues	Ch 18 Homework
			Ch 19: Work, Heat, and the First Law of Thermodynamics
Week 3			(1/22 - 1/26)
	23-Jan	Tues	Ch 19 Homework
			Ch 20: The Micro/Macro Connection
Week 4			(1/29 - 2/02)
	30-Jan	Tues	Ch 20 Homework
			Ch 21: Heat Engines and Refrigerators
Week 5			(2/05 - 2/09)
	6-Feb	Tues	Ch 21 Homework
	7-Feb	Wed	Practice Test 1
	8-Feb	Thurs	TEST 1 – Physics Testing Center
			Ch 16: Traveling Waves
Week 6			(2/12 - 2/16)
	13-Feb	Tues	Ch 16 Homework
			Ch 17: Superposition
Week 7			(2/19 - 2/23)
	20-Feb	Tues	Ch 17 Homework
			Ch 33: Wave Optics
Week 8			(2/26 - 3/01)
	27-Feb	Tues	Ch 33 Homework
			Ch 34: Ray Optics
Spring Break			(3/04 - 3/08)
Week 9			(3/11 - 3/15)
	12-Mar	Tues	Ch 34 Homework

	13-Mar	Wed	Practice Test 2
	14-Mar	Thurs	TEST 2 – – Physics Testing Center
			Ch 36: Relativity
Week 10			(3/18 - 3/222)
	19-Mar	Tues	Ch 36 Homework
			Ch 37: The Foundations of Modern Physics
Week 11			(3/25 - 3/29)
	26-Mar	Tues	Ch 37 Homework
			Ch 38: Quantization
Week 12			(4/01 - 4/05)
	2-Apr	Tues	Ch 38 Homework
			Ch 39: Wave Functions and Uncertainty
Week 13			(4/08- 4/12)
	9-Apr	Tues	Ch 39 Homework
Week 14			(4/15- 4/19)
	17-Apr	Wed	Practice Test 3
	18-Apr	Thurs	TEST 3 – Physics Testing Center
			Ch 40: One-Dimensional Quantum Mechanics
Week 15			(4/24- 4/28)
	23-Apr	Tues	Ch 40 Homework
Week 16			(4/29 - 5/03)
	2-May	Thurs	Final Exam – Physics Testing Center

Communicating With the Instructor

Yellowdig Engage

This course uses a discussion forum called "Yellowdig Engage" for general questions and comments about the course. Questions related to HW problems are appropriate and the course has experienced TAs who will provide comments and help in addition to your classmates. 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.

Note that email to the instructor (robert.nemanich@asu.edu) may be more appropriate for personal or individual questions.

Email

ASU email is an official means of communication . 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 ASU Online Student Accessibility . page 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.

Title IX and University Policy on Discrimination and Harassment

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at https://sexualviolenceprevention.asu.edu/faqs . As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, https://eoss.asu.edu/counseling. is available if you wish to discuss any concerns confidentially and privately. ASU online students may access 360 Life Services, https://goto.asuonline.asu.edu/success/online-resources.html .

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.