

2015

# Physics 143 Modern Physics

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# Physics 143

Summer 2015

Prerequisite: PHY 142

## Contact

Instructor: Dr. Norman Lowrey  
Email: [nlowrey@parkland.edu](mailto:nlowrey@parkland.edu)  
Cell: (217) 377-6305  
Office Hours: MTWR 10:50 – 11:20 AM, Room M124

## Materials

Textbook: Halliday & Resnick, *Fundamentals of Physics*, 10th ed.  
Calculator: any scientific calculator

## Content

This course is a survey of wave physics. We'll start with material such as waves moving along a string and waves rippling across a pond before progressing to wave concepts which might challenge your view of reality.

- If you crack a whip, it sends a density ripple through a medium of air. We sense this as sound.
- Jostling an electron causes it to emit traveling electric and magnetic fields. We sense this as light.

These wave concepts lead towards the provocative idea that matter itself has size because it consists of some sort of standing wave pattern. These thoughts led to the formulation of quantum mechanics.

## Grades

<i>Component</i>		<i>Letter</i>
Homework and Quizzes:	15%	A: 90%
Labs:	15%	B: 80%
Three One-Hour Exams:	45% (15% each)	C: 70%
Two-Hour Final Exam:	25%	D: 60%

➔ A PASSING GRADE REQUIRES AT LEAST A 60% LAB AVERAGE ←

- No make-up exams, labs, or quizzes are offered.
- Late homework assignments are not accepted.
- Your lowest lab score is dropped.
- If it helps, your final exam score replaces your lowest hour exam result.

➔ IF YOU MISS THE FINAL EXAM, CONTACT ME AS SOON AS POSSIBLE! ←

## Tentative Schedule

<u>Class</u>	<u>Chapter</u>	<u>Agenda</u>
6-15	15	Introduction, simple harmonic motion
6-16	16	String waves, lab (Simple Harmonic Motion)
6-17	17	Sound waves
6-18	17	Interference, resonance
6-22	33	Electromagnetic waves, light
6-23	33	Reflection, refraction, lab (Standing Waves)
6-24	34	Optics
6-25	34	Geometric optics, review, exam
6-29	35	Interference
6-30	35	Interference, lab (Air Columns)
7-1	36	Diffraction, lab (Basic Optics)
7-2		Observed Independence Day Holiday (no class)
7-6	37	Relativity
7-7	37	Relativity, lab (Refracting Telescopes)
7-8	37	More relativity
7-9	37	Relativity, review, exam
7-13	38	Intro to quantum mechanics
7-14	38	Quantum, lab (Virtual Objects)
7-15	39	Quantum
7-16	39	Quantum, lab (Diffraction)
7-20	39	Quantum
7-21	40	Atoms, lab (Spectra)
7-22	40	Atoms
7-23	42	Nuclei, review, exam
7-27	42	Nuclei
7-28	42	Nuclei, lab (Radioactivity Video)
7-29	41	Solids
7-30	41	Solids
8-3	--	review
8-4	--	review
8-5	--	review
8-6	--	Final Exam

### Homework and Quizzes

Homework will be assigned during each lecture session. All homework assignments are due at the beginning of class on the first Monday after they are assigned. Some homework questions might be completed in class either as examples or in-class practice. To receive credit, these questions must be submitted for grading. You may work in groups to solve homework questions (both in-class and out-of-class), but each student must submit his or her own solution.

A short quiz will be administered at the beginning of most lectures. Typically, the content of these quizzes will be similar to homework problems assigned during the previous lecture. Some lectures will have another quiz; these quizzes will usually, but not necessarily, occur near the end of class and will always involve basic concepts covered that day. Quizzes must be taken individually and are closed-book with no notes; equations as well as constants will be provided.

Each homework and quiz question is worth one point, and no partial credit will be awarded.

### Labs

Each lab is due at the beginning of class the Tuesday after completing observations and measurements. Like homework, students may collaborate with each other to discuss labs, but everyone must submit their own report. Regardless of length and difficulty, each lab has equal weight for grade purposes.

### Hour-Exams

Hour exams are scheduled on Thursday every two weeks (June 25, July 9, and July 23). These exams are closed-book, but you may use both sides on a single page of handwritten notes.

### Final Exam

The final exam is closed-book, but you may use both sides of two sheets of handwritten notes. Potential material on the final includes everything covered during the course.

### Disability

If you believe you have a disability for which you need an academic accommodation (including special testing, auxiliary aids, non-traditional instruction formats) please contact the following person and inform me as soon as possible:

Becky Osborne (X148, 353-2082), Coordinator of Disability Services,  
[bosborne@parkland.edu](mailto:bosborne@parkland.edu).

### Center for Academic Success

If you find yourself needing assistance of any kind to complete assignments, stay on top of readings, study for tests, or just to stay in school, please contact one of the following staff at the Center for Academic Success:

Anita Taylor  
Room: D120  
Phone: 353-2005

Gail Hoke  
Room: D120  
Phone: 351-2441

You may also email the CAS at [CenterForAcademicSuccess@parkland.edu](mailto:CenterForAcademicSuccess@parkland.edu).

### Academic Honesty

I have found there to be an increase in the frequency of cheating incidents in recent years. The Student Policies/Procedures Manual ([www.parkland.edu/studentpolicy/honesty](http://www.parkland.edu/studentpolicy/honesty)) defines cheating, fabrication, and plagiarism. Consequences can carry the penalty of a failing grade for the course and possibly suspension from the course.

Be mindful of a few ground rules regarding test-taking. Tests are closed-book and the following things would be considered cheating:

- exchange of materials of any kind (calculators, pencils, pens, information, anything)
- any talking
- looking at someone else's work

### Core Values

I believe strongly in the Core Values espoused by Parkland College: Honesty and Integrity, Fairness and Just Treatment, Responsibility, Multiculturalism, Education, and Public Trust. Essentially, these values set guidelines for how we should treat one another. Failure to be respectful of one another or to maintain ethical behavior will not be tolerated.

### Drops/Withdrawals

On the ten-day roster, I am required to assess your attendance. If you have not attended regularly to that point, you will be dropped with no refund of tuition or fees. After the ten-day roster, you should not plan on an instructor withdrawal if you want to withdraw from the course. You are ultimately responsible for your own withdrawal by the withdrawal date. Non-attendance after the ten-day roster will result in an F if you don't withdraw yourself.