



# Physics 234H - Fall 2014 - Section H01

## Physics III

Lecture Tuesday-Friday 04:00 - 05:25 pm, Tiernan 104

**Announcements:** Watch here for new information from time to time

Here is a [PDF of this page](#)  (213 kBytes) for printing, and the [Fall academic calendar is here](#).

Office Hours for Dale Gary: 10:00 am and 3 pm, Tuesdays and Fridays, in 101 Tiernan

**Sign-up for Mastering Physics: Select Course GARYPHYS234HF14**

First Common Exam: Room TBD, 4:15-5:45 pm Oct 6. [Study Guide \(from last year\)](#) (Chapters 14-16, 33-34)

Second Common Exam: Room TBD, 4:15-5:54 pm Nov 3. [Study Guide \(from last year\)](#) (Chapters 35-38)

Third Common Exam: Room TBD, 4:15-5:54 pm Dec. 1. [Study Guide \(from last year\)](#) (Chapters 39-41)

Final Exam: TBD [Practice Exam](#) -- [Study Guide](#) (Cumulative, plus Chapters 42-43)

[Devising your own experiment](#)

**Prerequisite: Math 112 or Math 112H.**

**Course Material::**

- **Textbook:** *University Physics, 13th Edition*, by Young and Freedman. We will cover chapters 14-16 and 33-44. Note: The bookstore has only volume 3, chapters 37-44, but when purchased it will give you the Mastering Physics online homework system, which includes access to the full etext electronically.
- **Physics Laboratory Manual** (for Phys 231A)
- **Classroom Response System** called “iClickers.” We will be using an “iClicker” during during both Tuesday and Friday lectures. They are available in the NJIT bookstore. Please be sure to

bring your clicker to each lecture.

- **Mastering Physics Online Homework System:** Be sure that your textbook is sold bundled with a Mastering Physics access coupon. Each student must enroll in the course specified by his/her instructor. Homework assignments will be posted on-line at <http://www.masteringphysics.com/>. Students login, download and solve the assigned problems, and submit answers to the automated grading system. **Sign-up for Mastering Physics Course GARYPHYS234HF14**



**Classroom Response System:** We will be using a classroom response system called *iClicker*. They are available for purchase in the NJIT bookstore.

## Instructors of other Phys 234 sections (non-honors)

- Onofrio (Lou) Russo, 458 Tiernan, [onofrio.lrusso@njit.edu](mailto:onofrio.lrusso@njit.edu)
- Slawomir Piatek, 423F Tiernan, [slawomir.piatek@njit.edu](mailto:slawomir.piatek@njit.edu)

## Attendance

It is expected that students will attend all lectures and recitations. Attendance will be taken at all classes and exams. More than 3 unexcused absences (in total) is excessive. If you have excusable absences contact your instructor or the Dean of First year Students. If you must withdraw from the course, do it officially through the Registrar. Do not simply stop attending and taking exams: that forces the instructor to assign a course grade of "F".

## Grading

Your final grade in Physics 234H will be determined by your performance on the following:

1. **Common Exams:** Three common exams will be given during the semester. The schedule is:
  - **Common Exam 1:** Monday, October 6th 4:15 – 5:45 PM See above in "announcements" for room assignment
  - **Common Exam 2:** Monday, November 3rd 4:15 – 5:45 PM
  - **Common Exam 3:** Monday, December 1st 4:15 – 5:45 PM
2. **Final Exam:** A comprehensive examination of the entire semester's work will be given at the end of the semester, during December 15 - 20. 2.5 hours long.
3. **Lecture Quizzes:** i-Clicker quiz questions covering items from the current lecture will be given during each lecture. **The grades count toward your final course grade**. There will be no make-up quizzes.
4. **Homework:** Homework assignments will be posted on-line using Mastering Physics Homework System. The ID number for your course section is **GARYPHYS234HF14**. You will need it when you set up your login on the Mastering Physics web site and enroll in your section of the course. Mastering Physics login: <http://www.masteringphysics.com/>. Homework will be due by 12 noon on the day of the Tuesday lecture. The recommended problems from the text (see

syllabus) will be discussed during the recitation class.

5. **Experiment Project:** As part of your grade, you will devise your own experiment in one of the categories of geometric optics, interference, or diffraction. You will write up the concept, actually perform the experiment, and produce a report of the concept, performance, and results.

## From the Syllabus:

In-class i-Clicker Questions/quizzes covering the preceding or current work may be given during lectures and/or recitations. Those scores count toward your final course grade. **There are no make-ups for in class activities.** Students missing an i-Clicker quiz will receive a grade of zero for that item. The general policy is that students who miss a common exam will receive a score of zero for that Exam. That score will be included in the calculation of your final grade. Students who miss two common exams automatically fail the course. ***Students who anticipate an absence from a common exam should discuss their situation with their instructor PRIOR TO their absence.*** In order to be qualified to receive a "make-up" common exam score (a very rare occurrence), the student should present documentation for not being able to take the test as scheduled. As is the standard policy of NJIT, this documentation should be presented to the student's Physics 234 instructor AND to the Dean of Students - (973) 596-3466, 255 Campus Center. BOTH the Physics 234 instructor and Dean of Students must concur in permitting a "make-up" common exam. Students who miss common exams that do not present documentation within 7 days of the common exam will receive a score of zero for the common exam.

In the event that the above qualification is met, a separate make-up test for the missed common quiz will not be offered. Instead, the portion of the final exam relevant to the contents of the missed test will be considered for giving a grade for the missed test. The instructor will evaluate the final exam questions from those chapters and normalize this portion of the student's grade for the missed common quiz.

The final grades will be based on a **composite score** that includes each common exam score, the final exam, short quizzes, the term's homework score, and a report on an experiment of your own devising. Here are the approximate weights to be used for calculating the final grade and the final grade scale:

45% for all three common exams (15% each)	85% and more	A
25% for the final exam	80% - 84%	B+
12% for the total homework grade	70% - 79%	B
8% for the total lecture quiz grade	65% - 69%	C+
10% for the experiment report	55% - 64%	C
	50% - 54%	D
	49% and less	F

Grades are not negotiable. A score of 84.99999% is a B+, not an A

## **HONOR CODE STATEMENT:**

NJIT has a zero-tolerance policy for cheating of any kind and for student behavior that disrupts learning by others. Violations will be reported to the Dean of Students. The penalties range from a minimum of failure in the course plus disciplinary probation up to expulsion from NJIT. Avoid situations where your

own behavior could be misinterpreted as dishonorable. **Students are required to agree to the NJIT Honor Code on each exam, assignment, quiz, etc. for the course.**

Turn off all cellular phones, wireless devices, computers, and messaging devices of all kinds during classes and exams. Please do not eat, drink, or create noise in class that interferes with the work of other students or instructors. Creating noise or otherwise interfering with the work of the class will not be tolerated.

**HELP:** Visit or email your instructor if you are having trouble with the course; do not simply hope for a miracle and fall further behind. The Physics Dept. office on the 4th floor of Tiernan has specific information on tutoring. Physics tutoring is available through the CAPE organization, and possibly elsewhere.

## Learning Outcomes

For this course, which is the third of the introductory Physics series, you can expect to be assessed on the following learning outcomes:

1. Recall the definitions and relationships involving oscillations and waves, such as wavelength, frequency, angular frequency, amplitude, phase, wave speed, restoring force, longitudinal and transverse waves, standing waves, damping, interference, diffraction, doppler shift, and other wave phenomena.
2. Comprehend the meaning of the equations governing oscillations and waves, and be able to manipulate them to obtain any desired quantitative relationship. Understand the extension of these equations to the quantum realm (wave-particle duality) for free particles, atoms and nuclei. Generalize the concepts underlying the equations, such as restoring force, inertia, energy.
3. Apply the equations governing oscillations and waves to mechanical systems for various boundary conditions, to optical systems, and to quantum physics in atomic and nuclear systems. Calculate unknown quantities based on physical relationships, boundary conditions, and known quantities.
4. Analyze graphs of oscillatory and wave phenomena to obtain wavelength, frequency, amplitude, phase, particle and wave position, velocity, acceleration, damping time constant, as a function of time. Identify and distinguish types of wave motion such as transverse, longitudinal, standing waves, reflection, refraction.
5. Evaluate the soundness and precision of your answers. Explain and interpret your solutions to problems in a way that shows deeper understanding. Identify and appraise the range of applicability of your results, and their limitations.
6. Devise your own small experiment to demonstrate some phenomenon in one of the categories of geometric optics, interference, or diffraction.

## Syllabus

TOPIC	TEXT STUDIES	RECOMMENDED PROBLEMS	HW Assignments
Week 1 <a href="#">Oscillations and Waves</a>	September 2 Chapt.14 Sect.1-7	pg. 463 - 4, 11, 21, 27, 34, 50, 57 pg. 500 - 4, 12,	Mastering Physics Ch 14-15 HW

	Chapt. 15 Sect. 1-8	19, 32	
Week 2 <u>Sound</u>	September 9 Chapt. 16 Sect. 1-9	pg. 543 – 1, 7, 19, 29 (see table 19.1), 38, 39, 52, 73	Mastering Physics Ch 16 HW
Week 3 <u>Light</u>	September 16 Chapt. 33 Sect. 1-7	pg. 1107 – 8, 11, 23, 24, 25, 33, 48	Mastering Physics Ch 33 HW
Week 4 <u>Geometric Optics</u>	September 23 Chapt. 34 Sect. 1-3	pg. 1154 –3, 10, 11, 18, 35, 39, 46, 63	Mastering Physics Ch 34 HW1
Week 5 <u>Geometric Optics</u>	September 30 Chapt. 34 Sect. 4-8	pg. 1154 –3, 10, 11, 18, 35, 39, 46, 63	Mastering Physics Ch 34 HW2
Week 6 <u>Interference</u>	October 7 Chapt. 35 Sect. 1-5	pg. 1184 –6, 17, 21, 33, 35, 41, 43, 54	Mastering Physics Ch 35 HW
Week 7 <u>Diffraction</u>	October 14 Chapt. 36 Sect. 1-7	pg. 1216 –3, 19, 23, 32, 35, 45, 47, 65	Mastering Physics Ch 36 HW
Week 8 <u>Relativity</u>	October 21 Chapt. 37 Sect 1-9	pg. 1254 –4, 6, 13, 21, 23, 36, 45, 57	Mastering Physics Ch 37 HW
Week 9 <u>Photons</u>	October 28 Chapt. 38 Sect. 1-4	pg. 1282 –7, 10, 15, 21, 27, 35, 43	<b>Experiment concept due</b> Mastering Physics Ch 38 HW
Week 10 <u>Particles and Waves</u>	November 4 Chapt. 39 Sect. 1-6	pg. 1320 – 9, 22, 24, 39, 47, 53, 63	Mastering Physics Ch 39 HW
Week 11 <u>Quantum Mechanics</u>	November 11 Chapt. 40 Sec. 1-5	pg. 1357 – 9, 14, 18, 36, 51, 52, 62	<b>Record of performance of experiment due</b> Mastering Physics Ch 40 HW
Week 12 <u>Atomic Structure</u>	November 18 Chapt. 41 Sect. 1-7	pg. 1399 – 3, 13, 17, 23, 43, 49, 62	Mastering Physics Ch 41 HW
Week 13 <u>Molecules &amp; Condensed Matter</u>	November 26 (This is a Wednesday, when Friday classes meet) Chap.42 Sec.1-8	pg. 1433 – 2, 11, 13, 19, 27, 33, 40, 49, 57	<b>Writeup of experiment concept, performance, and results due Dec. 5</b> Mastering Physics Ch 42 HW
Week 14 <u>Nuclear Physics</u>	December 2 Chap. 43 Sec.1-8	pg. 1474 –	Mastering Physics Ch 43 HW
	December 9	No assigned HW	

