

Spring 2021

## **PHYS 234-102: Physics III**

Andres Jerez

Follow this and additional works at: <https://digitalcommons.njit.edu/phys-syllabi>

---

### **Recommended Citation**

Jerez, Andres, "PHYS 234-102: Physics III" (2021). *Physics Syllabi*. 321.  
<https://digitalcommons.njit.edu/phys-syllabi/321>

This Syllabus is brought to you for free and open access by the NJIT Syllabi at Digital Commons @ NJIT. It has been accepted for inclusion in Physics Syllabi by an authorized administrator of Digital Commons @ NJIT. For more information, please contact [digitalcommons@njit.edu](mailto:digitalcommons@njit.edu).

Instructor: **Andres Jerez:** [jerez@njit.edu](mailto:jerez@njit.edu)

Lecture Times: Wednesdays, 6:00 PM – 8:50 PM,  
Synchronous Online via Webex

Office hours: Online, by appointment.

**PREREQUISITE:** Math 112 or 112H

**FAILURE TO MEET EITHER CO-Requisites or PRE-Requisites will result in student being dropped from class.**

### **COURSE MATERIAL:**

- **Mastering Physics Homework System (REQUIRED):** Each student must enroll in the course specified by the instructor by obtaining access to Mastering Physics for University Physics with Modern Physics, 15th edition, Young and Freedman, Pearson (June 14th 2019) - Copyright © 2020. There are several purchase options based on duration and whether or not the e-book is included. Please see this link <https://www.pearson.com/store/p/university-physics-with-modern-physics/P100002510958>. Here are the instructor and course information needed for registration (*See below for instructions on how to register for this particular section*):
  - Instructor's Course ID: jerez23316
  - Course Name: PHYS III 234 102, Spring 2021Homework assignments will be posted online in Mastering Physics. Students login, solve the assigned problems, and submit answers to the automated grading system.
- **Textbooks:** The homework and the structure of the course follows University Physics with Modern Physics, 15th edition, Young and Freedman, Pearson, which can be obtained as an ebook with the Mastering Physics registration. It is not a requirement, as opposed to MasteringPhysics. However, I strongly encourage you to have access and use to a College Physics textbook. An alternative to consider may be the Openstax textbooks, <https://openstax.org/details/books/university-physics-volume-3> (and volume 1 as well).

### **ELEMENTS OF THE COURSE:**

**CANVAS:** The Learning Management System at NJIT is [Canvas](#) . Lecture notes, some assignments, grades, exams, and additional course material will be managed through Canvas.

**LECTURES:** Lectures follow the [Synchronous Online Mode](#). 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) are excessive. If you have excusable absences contact the Dean of 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."

### **EXAMS:**

**Common Exams** There will be three common exams during the semester. The exams will be given online, using Canvas, LockDown browser plus Webex for proctoring. The exam schedule is:

- Common Exam 1: Monday, March 1<sup>st</sup> 4:15 – 5:45 PM, Online
- Common Exam 2: Monday, April 5<sup>th</sup> 4:15 – 5:45 PM, Online
- Common Exam 3: Monday, April 26<sup>th</sup> 4:15 – 5:45 PM, Online

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 that 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 [dos@njit.edu](mailto:dos@njit.edu) - (973) 596-3466, Campus Center, Room 255. 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.

Final Exam: Online, Wednesday, May 12<sup>th</sup>, 6:00pm-8:30pm

**HOMEWORK:** assignments will be posted online using the Mastering Physics Homework System: [www.masteringphysics.com](http://www.masteringphysics.com) (see above).

**QUIZZES AND ASSIGNMENTS:** There will be quizzes during the lecture and other activities on the topics covered.

**GRADING:** Your final letter grade in Phys 234 will be based on a composite score for term's work that includes the common exam scores, the final exam, and the homework score.

***Final Letter Grades:*** Here are the weights to be used for calculating the composite score:

- 45% for the three common exams (15% each)
- 25% for the final exam
- 15% for the total of homework work
- 15% for the quizzes and assignments

The cutoff percentages for various letter grades will be in the range of:

85% for A

80% for B+

70% for B

65% for C+

50% for C

40% for D

F below 40 %

Final grades are not negotiable: A score of 84.999999% is a B+, not an A.

**LAST DAY TO WITHDRAW:** April 12<sup>th</sup>

**ONLINE EXAMS, LOCKDOWN BROWSER AND WEBEX:**

*NJIT policy requires that all midterm and final exams must be proctored, regardless of delivery mode, in order to increase academic integrity. Note that this does not apply to essay or authentic based assessments. Effective beginning Fall semester 2019, students registered for a fully online course section (e.g., online or Hyflex mode) must be given the option to take their exam in a completely online format, with appropriate proctoring.*

In this course you will be required to use the following proctoring methods to ensure academic integrity for exams. Please see NJIT's response to questions about online proctoring [here](#). See below for more information about how exams will be proctored in this course.

### **Webex**

Webex can be used to allow instructors to proctor exams themselves. Your instructor will schedule a Webex exam session and share the meeting information with you ahead of time. The exam in Canvas will be password-protected. You can connect to the Webex session with either your phone or computer. You can find links to download the mobile app from the App Store or Google Play Store at the bottom of [njit.webex.com](http://njit.webex.com).

When your instructor is ready to start the exam, they will provide the exam password in the meeting so all students can begin the Canvas quiz. Your instructor will then watch you, via the web camera, as you take the exam. Students are expected to remain connected to the Webex session until their exam is submitted. The session may also be recorded by your instructor.

In order to use Webex for proctored exams, you will need the following:

- High-speed internet connection
- Smartphone with camera, connected to Webex
- The process for connecting to Webex will be the same as when you connect for a class.

Tips for ensuring a smooth experience while using Webex:

- Connect to your Webex session before class starts.
- Log into Canvas before connecting to Webex.

### **Respondus LockDown Browser**

Respondus LockDown Browser is a locked browser for taking assessments or quizzes in Canvas. It prevents students from printing, copying, going to another URL, or accessing other applications during a quiz. If a Canvas quiz requires that LockDown Browser be used, students will not be able to take the assessment or quiz with a standard web browser.

The webcam can be built into your computer or can be the type that plugs in with a USB cable. Watch this [short video](#) to get a basic understanding of LockDown Browser and the webcam feature. A student [Quick Start Guide \(PDF\)](#) is also available.

***Respondus Lockdown Browser does not work with Linux and Chromebooks at this time. Please visit the [Respondus Knowledge Base article on computer requirements](#) for additional information.***

The LockDown Browser integration requires students to:

- (1) manually start LockDown Browser,
- (2) log into Canvas, and
- (3) navigate to the quiz that requires LockDown Browser.

1. Download and install LockDown Browser from [this link](#) .
2. Once your download and installation has finished, locate the “LockDown Browser” shortcut on your desktop and double-click it. (For Mac users, launch “LockDown Browser” from the Applications folder.)
3. You will be brought to the Webauth Authentication Service page, where you can log in with your NJIT UCID and password.
4. From your Dashboard or under “Courses”, click on the course in which you have to take the exam that requires LockDown Browser.
5. After you enter the course, find the exam and click on it.
6. Click the “Take the Quiz” button. Once a quiz has been started with LockDown Browser, you cannot exit until the “Submit Quiz” button is clicked.

Questions or problems can be submitted via web form by going to: <https://servicedesk.njit.edu> and clicking on the "Report your issue online" link. You may also call the IST Service Desk with any questions at 973-596-2900.

### **[More Information and Tips on Ensuring a Smooth Experience](#)**

**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.**

- Statement on Academic Integrity:
  - *“Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: <http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>.*

*Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at [dos@njit.edu](mailto:dos@njit.edu)”*

**HELP:** Contact your instructor if you are having trouble with the course; do not simply hope for a miracle and fall further behind. There is online tutoring offered by the Physics Department. For information and appointments follow this link: <https://physics.njit.edu/physics-tutoring-sign-sheet>

### **To register for PHYS III 234 102, Spring 2021:**

1. Go to <https://www.pearson.com/mastering>.
2. Under Register, select **Student**.
3. Confirm you have the information needed, then select **OK! Register now**.
4. Enter your instructor’s course ID: jerez23316, and **Continue**.
5. Enter your existing Pearson account **username** and **password** to **Sign In**. You have an account if you have ever used a MyLab or Mastering product.
  - If you don’t have an account, select **Create** and complete the required fields.
6. Select an access option.
  - Enter the access code that came with your textbook or that you purchased separately from the bookstore.
  - If available for your course,
    - Buy access using a credit card or PayPal.
    - Get temporary access.

If you're taking another semester of a course, you skip this step.

7. From the You're Done! page, select **Go To My Courses**.
8. On the My Courses page, select the course name **PHYS III 234 102, Spring 2021** to start your work.

### **To sign in later:**

1. Go to <https://www.pearson.com/mastering>.
2. Select **Sign In**.
3. Enter your Pearson account **username** and **password**, and **Sign In**.
4. Select the course name **PHYS III 234 102, Spring 2021** to start your work.

### **To upgrade temporary access to full access:**

1. Go to <https://www.pearson.com/mastering>.
2. Select **Sign In**.
3. Enter your Pearson account **username** and **password**, and **Sign In**.
4. Select **Upgrade access** for **PHYS III 234 102, Spring 2021**.
5. Enter an access code or buy access with a credit card or PayPal.

### **LEARNING OUTCOMES:**

- 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.
- 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, and energy.
- 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.

- 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, and refraction.
- 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.

TOPIC	TEXT STUDIES
Week 1 Oscillations	Chapter 14 – Sections 1-8
Week 2 Waves	Chapter 15 – Sections 1-8
Week 3 Sound	Chapter 16 – Sections 1-8
Week 4 Light	(Chapt. 32 – Sections 1-3) Chapt. 33 – Sections 1-7
Week 5 Geometric Optics	Chapt. 34 – Sections 1-4
Week 6 Interference	Chapt. 35 – Sections 1-4
Week 7 Diffraction	Chapt. 36 – Section 1-7
Week 8 Relativity	Chapt. 37 – Sections 1-8
Week 9 Photons	Chapt. 38 – Sections 1-4
Week 10 Particles and Waves	Chapt. 39 – Sections 1-6
Week 11 Quantum Mechanics	Chapt. 40 – Sections 1-5
Week 12 Atomic Structure	Chapt. 41 – Sections 1-6
Week 13 Molecules and Condensed Matter	Chap. 42 – Sections 1-3
Week 14 Band Structure, PN Junction, & Transistors	Chap. 42 – Sections 4-7

***Spring Break: March 14-March 21***

***Tuesday, May 4, follows Friday Schedule***

***LAST DAY OF CLASSES: Tuesday, May 4***

***READING DAYS: May 5, 6***

***FINAL EXAM PERIOD: May 7 – May 13***