

Spring 2021

## **PHYS 111-004: Physics I**

Andres Jerez

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

Lecture Times: Thursdays and Mondays, 9:00 AM – 10:20 AM,  
Synchronous Online via Webex

Office hours: Online, by appointment.

**PREREQUISITE:** Math 131 (if not originally placed in Math 111)

**COREQUISITE:** Math 111 or Math 132, Phys 111A

*(Note: (A) If you have an approved medical accommodation from the Dean of Students, you are allowed to take the Phys 111A lab course online. (B) If you do not have an approved medical accommodation, then the Phys 111A lab course cannot be taken online and has to be face-to-face. (C) Because of the COVID19 issues, the Physics Department is allowing students to take the Phys 111 course without the lab, thus allowing one do the lab in a later semester and face-to-face.)*

**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: jerez26068
  - Course Name: PHYS 111 – 004 - 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-1>.

### **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 Midterm Exam:** There will be one common exams during the semester. The exam will be given online, using Canvas, LockDown browser plus Webex for proctoring. The exam schedule is:

- Common Exam 2: Monday, April 5<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. 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 111 instructor AND to the Dean of Students [dos@njit.edu](mailto:dos@njit.edu) - (973) 596-3466, Campus Center, Room 255. BOTH the Physics 111 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, comprehensive. Final Exam week, 05/07 – 05/13

**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 111 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:

- 25% for the common exams (15% each)
- 35% for the final exam
- 20% for the total of homework work
- 20% 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+  
55% for C  
50% for D  
F below 50 %

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 111 – 004 - 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: jerez26068, 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 111 – 004 - 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 111 – 004 - 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 111 – 004 - Spring 2021**.
5. Enter an access code or buy access with a credit card or PayPal.

### **LEARNING OUTCOMES:**

1. Manipulate vectors in components form and as magnitude/direction. Perform vector operations such as addition, subtraction, scalar, and cross products.
2. Recall the definitions and relationships involving position, velocity, speed, acceleration.
3. Apply the equations governing 1-D constant acceleration to mechanical systems for various initial conditions.
4. Apply the equations governing 2-D constant acceleration to mechanical systems for various initial conditions.
5. Comprehend the meaning of the equations governing net force and acceleration (Newton’s Laws) for linear motion, and be able to manipulate them in conjunction with a free-body diagram to obtain any desired quantitative relationship.
6. Understand the extension of free-body diagrams and Newton's laws to rotational motion.
7. Understand the extension of free-body diagrams and Newton's laws to frictional forces.
8. Comprehend the definitions and application of work, energy, and conservation of energy principles to solving mechanical and non-conservative systems.
9. Comprehend the meaning of equations governing momentum, impulse, and collisions. Apply the equations governing momentum, impulse, and collisions mechanical systems for various initial conditions. Understand under what conditions momentum is conserved and how to use this relation to calculate unknown quantities based on physical relationships, initial conditions, and known quantities.

10. Define and calculate the center of mass of a system as well as the moment of inertia.
11. Extend the concepts and equations of 1-D constant acceleration to rotational motion for various initial conditions.
12. Understand the extension of linear motion equations to rotational motion. Comprehend the meaning of the equations governing rotational motion and acceleration, and be able to manipulate them in conjunction with a free-body diagram to obtain any desired quantitative relationship.
13. Understand the extension of work, energy, and conservation of energy principles to rotational motion.
14. Recall the definitions of angular momentum. Apply this concept to conservation of angular momentum.
15. Apply concepts of Newton's Laws to equilibrium of linear and rotational motion.
16. Understand the extension of conservation of energy and mass equations to fluid dynamics.
17. Understand the extension of Newton's Laws and energy concepts to gravitation.

TOPIC	TEXT STUDIES	NOTES
Week 1 Units, Physical Quantities, and Vectors	01/18 Chapt.1	
Week 2 Motion in One Dimension	01/25 Chapt. 2	
Week 3 Motion in Two Dimensions	02/01 Chapt. 3	Optional: Sect. 3.5
Week 4 Newton's Laws of Motion	02/08 Chapt. 4	
Week 5 Applying Newton's Laws I	02/15 Chapt. 5	Optional: Sect. 5.5
Week 6 Applying Newton's Laws II	02/22 Chapt. 5	
Week 7 Work, Kinetic Energy	03/01 Chapt. 6	Refresh: scalar (dot) product
Week 8 Potential Energy, Conservation of Energy	03/08 Chapt. 7	Optional: Sect. 7.5
<i>Spring Break</i>		
Week 9 Linear Momentum and Collision	03/22 Chapt. 8	Optional: Sect. 8.6
Week 10 Rotation, Moment of Inertia	03/29 Chapt. 9	
Week 11 Dynamics of Rotational Motion	<b>04/05</b> Chapt. 10 – Sections 1-6	<b>Midterm Exam (4/5): Ch. 1 to 7</b>
Week 12 Static Equilibrium	04/12 Chapt. 11 – Sections 1-3	
Week 13 Fluid Mechanics	04/19 Chap.12 – Sections 1-5	
Week 14 Universal Gravitation	04/26 Chap. 13	Optional: Sect. 13.6, 13.7
Week 15	05/03 REVIEW	
<b>Final Exam</b>	<b>TBA</b>	<b>Comprehensive Exam Chapters 1 to 13 with emphasis on 8 to 13</b>

*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**