

Spring 2020

## PHYS 103-008: General Physics (Revised for Remote Learning)

Halina Opyrchal

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INSTRUCTOR: Halina Opyrchal, email: [opyrchal@njit.edu](mailto:opyrchal@njit.edu), Office: TIER 454

[REVISED ON 3/17/2020]

Office hours: Tuesday, 10:00 – 11:20 AM Friday, 10:00 -11:20 AM ON-LINE DURING REMOTE LEARNING

**PRE-REQUISITES AND CO-REQUISITES:**

- Pre-requisites: Phys 102 with grade C or better
- Co-requisites: Phys 103A (the lab course) unless previously taken

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

**COURSE MATERIAL:**

- **Textbook:** “Physics: Principles with Application, Seventh Edition by Douglas C. Giancoli, Prentice Hall, ISBN – 13: 978-0-321-62592-2
- **Classroom Response System** called “**IClickers**”: They are available in the NJIT bookstore. Please bring your clicker to each lecture class.
- **Mastering Physics Homework System:** Be sure that your textbook is sold bundled with a Mastering Physics student access code card. In addition to having **a valid access code**, each student must enroll in the Mastering Physics (MP) course within his/her Physics 103 section using a course identifier code to be supplied by each instructor. Homework assignments will be posted on-line. Students login, download and solve the assigned problems, and submit answers to the automated grading system.
- **Warning:** Used textbooks may be sold with a MasteringPhysics access card with not valid access code

**NOTE:** THE LABORATORY COURSE, PHYS 103A, MUST BE TAKEN CONCURRENTLY WITH PHYS 103 THE STUDENT MUST REGISTER FOR BOTH THE LEC/REC AND THE LAB COURSE. WITHDRAWAL FROM EITHER COURSE WILL CAUSE A SIMULTANEOUS WITHDRAWAL FROM BOTH COURSES.

**CLASS ATTENDANCE:** The NJIT attendance policy is the following: “It is expected that students will attend all classes. Your teacher will take attendance at all classes and exams. More than 3 unexcused absences (in total) are excessive.

**COMPUTER:**

**DURING SCHOOL CLOSURE, ACCESS TO A COMPUTER WITH HIGH SPEED INTERNET CONNECTION, \*WEBCAM (INTERNAL OR EXPTENAL), MICROPHONE AND AUDIO (INTERNAL OR EXTERNAL), AND \*WINDOW/APPLE OPERATING SYSTEM IS REQUIRED. (WEBCAM AND WINDOW/APPLE OPERATING SYSTEM ARE FOR ONLINE EXAM WITH ONLINE PROCTORING SERVICE.)**

**MOODLE:**

**LECTURE NOTES, SAMPLE EXAMS AND RECITATION PROBLEMS WILL BE POSTED ON MOODLE .**

**WEBEX:**

**DURING REMOTE LEARNING, LECTURE/RECITATION WILL BE GIVEN BY WEBEX.  
CHECK INFORMATION ON [HTTP://IST.NJIT.EDU/WEBEX/](http://ist.njit.edu/webex/)**

**HELP:** Visit or email your instructors 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 4<sup>th</sup> floor of Tiernan has specific information on tutoring. Physics tutoring is available through the CAPE organization, and possibly elsewhere.

**GRADING:** Final letter grades will be based on a **term average** for the semester’s work that includes the three common exam scores, the final exam, the homework score, and in-class quiz score.

**COMMON EXAMS** Three common exams will be given during the semester. The schedule is:

**Common Exam 1:** Wednesday, February 19 4:15 – 5.45 PM

**COMMON EXAM 2 IS CANCELED**

**COMMON EXAMS 2 and 3 COMBINED** : Wednesday, April 29 hours to be announced

**COVERAGE:** CH.14.1 - 9, CH. 15.1 - 6, CH 11.1 - 8, CH 12.1, 2, 4 6, 7 CH.18.1-7, CH 19.1- 3

**FOR COMBINE EXAM 2/3 AND FINAL EXAM ALL PROBLEMS WILL BE MULTIPLE CHOICE**

**ON-LINE PROCTORING SERVICE, PROCTORU, IS LIKELY TO BE USED FOR REMOTE ONLINE EXAMS. IN ORDER TO USE PROCTORU, YOU WILL NEED THE FOLLOWINGS.**

- HIGH-SPEED INTERNET CONNECTION
- WEBCAM (INTERNAL OR EXTERNAL)
- MICROPHONE AND AUDIO (INTERNAL OR EXTERNAL)
- WINDOWS OR APPLE OPERATING SYSTEM
- NJIT ID OR PHOTO-ISSUED ID
- REFLECTIVE SURFACE SUCH AS A SMALL MIRROR

**HOMEWORK** Homework assignments will be posted on-line using the Mastering Physics Homework System. Please register for your section using. login: [www.masteringphysics.com](http://www.masteringphysics.com).

#### **COURSE CODES TO REGISTER TO HOMEWORK CLASSES ARE**

**Section 006 – PHYS103006SPR20**

**Section 008 –PHYS103008SPR2020**

**LECTURE QUIZZES** In-class I-Clicker Questions/quizzes covering the preceding or current work will 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 question/ quiz will receive a grade of zero for that item.

**FINAL EXAM** Comprehensive Final Exam will be given during Final Exam Period.

**Here are the approximate weights to be used for calculating term averages:**

- **48%** for **TWO** common exams [**16% FOR EXAM 1, 32% FOR EXAM 2/3 COMBINED**]
- **32%** for the final exam
- **20%** for the total of homework plus short in-class quizzes with the 20% value distributed at each instructors' discretion and announced during the first week of class. Homework will be worth about **10%** to **20%**.

**The conversion of term average values to letter grades will use the following cutoff values:**

- **80%** for A, **76%** for B+, **66%** for B, **56%** for C+, **50%** for C, and D or F below 50%.

#### **COURSE POLICIES**

In order to insure consistency and fairness in application of the NJIT policy on withdrawals, student requests for withdrawals after the deadline (*end of the 10th week of classes*) will not be permitted unless extenuating circumstances are documented **through the Office of the Dean of Students**. The course instructor and the Dean of Students are the principal points of contact for students considering withdrawing from a course. When a student invokes extenuating circumstances for any reason (late withdrawal from a course, request for a make-up exam, request for an Incomplete

grade) the student will be sent to the Dean of Students Office. The Dean of Students will be making the determination of whether extenuating circumstances exist or not and will be notifying the instructor accordingly. Instructors should never request or accept medical or other documents from students; such documents need to be submitted by the student to the Dean of Students.

### **HONOR CODE**

***“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>.***

***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)”***

**LEARNING OUTCOMES:** For this course you can expect to be assessed on the following learning outcomes:

1. Comprehend the meaning of equations governing the fluid at rest and fluid in motion. Understand the extension of conservation of energy and mass equations to fluid dynamics.
2. Define temperature scales.
3. Understand the phenomena of thermal expansion and Ideal Gas Law,
4. Understand the concept of heat and comprehend the meaning of equations governing the calorimetry and heat transfer.
5. Understand the basics concepts of thermodynamics.
6. Comprehend the meaning of equations governing oscillations and mechanical waves and apply those concepts to solve related problems.
7. Understand the concept of electric charge, electric field, electric potential, and electric current. Apply those concepts to solve simply circuits.
8. Understand the basic concepts of geometrical optics and learn how to apply them for mirrors, lenses and optical fibers.
9. Comprehend the wave theory of light and apply it the phenomena of interference and diffraction.

	Topic	Text Study	Recommended Problems	
Week 1 Jan. 21 – Jan. 26	Elasticity, Density and Pressure, Fluids at Rest	Chapt. 9 Sect. 5-6 Chapt.10 Sect. 1-7	p. 256 prob. 40, 45, 50 p. 285 prob. 2, 12, 14, 19, 23 27, 34,	<a href="#">Intro</a>
Week 2 Jan.27 – Feb. 02	Fluids in Motion	Chapt. 10 Sect. 8-10	p. 285 prob. 47, 48. 49, 50, 53, 80	<a href="#">A</a>
Week 3 Feb. 03 – Feb. 09	Temperature, Thermal Expansion, The Ideal Gas Law	Chapt. 13 Sect. 1-8	p.385 prob. 5, 12, 15, 19, 24, 31,39, 78	<a href="#">7</a>
Week 4 Feb. 10 – Feb. 16	Specific Heat, Calorimetry, Latent Heat,	Chapt. 14 Sect. 1-5	p.408 prob. 2, 13, 14, 25, 27, 34	<a href="#">D</a>
Week 5 Feb. 17 – Feb. 23	Transfer of Heat	Chapt. 14 Sect. 6 - 8	p.408 prob. 38, 42, 43, 54	<a href="#">E</a>
Week 6 Feb. 24 – March 01	Thermodynamics	Chapt. 15 Sect. 1-7	p. 438 prob. 1, 18, 19, 24, 32,	<a href="#">F</a>
Week 7 March 02 – March 08	Simple Harmonic Motion, Waves, Standing Waves	Chapt. 11 Sect. 1-12	p. 322 prob.3, 7, 8, 14,18, 27, 36, 37, 40, 49, 52,	<a href="#">G</a>
Week 8 March 09 – March 15	Sound	Chapt. 12 Sect.1-7	p. 354 prob. 3, 4, 9, 14, 27, 28, 56, 63	<a href="#">B1</a>
Week 9 March 15 – March 22	SPRING RECESS			
Week 10 March 23 – March 30	Electric Charges, Electric Field, Electric Potential	Chapt.16 Sect.1-5, 7 Chapt. 17 Sect. 1-2	p. 468 prob. 2, 3, 19, 21, p. 496 prob. 3, 4, 6, 9	<a href="#">W</a>
Week 11 March 31 – April 05	Electric Current, Resistance, Electric Power	Chapt.18 Sect. 1-7	p.521 prob.1, 9, 13, 17, 28, 37, 47, 54	<a href="#">J</a>
Week 12 April 06 – April 12	Electric Circuits	Chapt.19 Sect. 1- 5, 7	p. 552 prob. 1, 4, 12, 15, 16, 77	<a href="#">H</a>
Week 13 April 13 – April 19	Light: Reflection, Mirrors, Refraction	Chapt. 22 Sect. 3-4 Chapt. 23 Sect. 1-3	p. 673 prob. 4, 9, 12, 25, 26, 28, 29, 72	<a href="#">215</a>
Week 14 April 20 – April 26	Light: Total Internal Reflection, Lenses	Chapt. 23 Sect. 4-8	p. 673 prob. 35, 36, 41, 43, 47, 48	<a href="#">M</a>
<b>APRIL 29</b>	<b>COMMON EXAM 3 (HOURS: TO BE ANNOUNCED)</b>	<b>COVERAGE COMBINES EXAMS 2 AND 3:</b>	<b>CH.14.1 - 9, CH. 15.1 - 6, CH 11.1 - 8, CH 12.1, 2, 4 6, 7 CH.18.1-7, CH 19.1- 3</b>	
Week 15 April 27 – May 04	Interference, Diffraction Grating, Resolution	Chapt. 24 Sect. 1, 3, 4, 6 Chapt. 25 Sect. 7-9	p. 707 prob. 1, 4, 7, 33, 38 p. 740 prob. 53, 55, 67, 83	<a href="#">N</a>
Week 16 May 05	REVIEW FOR FINAL			

**SPRING RECESS – MARCH 15-22**

**GOOD FRIDAY – APRIL 10**

**MAY 5, TUESDAY FOLLOWS FRIDAY SCHEDULE**

**READING DAYS – MAY 6-7**

**FINAL EXAM PERIOD – MAY 09 -14**

## **Spring 2020 Academic Calendar**

January 20	Monday	Martin Luther King, Jr. Day
January 21	Tuesday	First Day of Classes
January 25	Saturday	Saturday Classes Begin
January 31	Friday	Last Day to Add/Drop a Class
January 31	Friday	Last Day for 100% Refund, Full or Partial Withdrawal
February 1	Saturday	W Grades Posted for Course Withdrawals
February 3	Monday	Last Day for 90% Refund, Full or Partial Withdrawal, No Refund for Partial Withdrawal after this date
February 17	Monday	Last Day for 50% Refund, Full Withdrawal
March 9	Monday	Last Day for 25% Refund, Full Withdrawal
March 15	Sunday	Spring Recess Begins - No Classes Scheduled - University Open
March 22	Sunday	Spring Recess Ends
April 6	Monday	Last Day to Withdraw
April 10	Friday	Good Friday - No Classes Scheduled - University Closed
May 5	Tuesday	Friday Classes Meet
May 5	Tuesday	Last Day of Classes
May 6	Wednesday	Reading Day 1
May 7	Thursday	Reading Day 2
May 8	Friday	Final Exams Begin
May 14	Thursday	Final Exams End
May 16	Saturday	Final Grades Due