

Fall 2021

PHYS 103-003: General Physics

Halina Opyrchal

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INSTRUCTOR: Halina Opyrchal, email: opyrchal@njit.edu, halina.jan.opyrchal@gmail.com

Classes meet:

Section 001 Wednesday (Lec), 1:00 – 2:20 PM KUPF 210 Friday (Rec), 1:00 – 2:20 PM CKB 317
Section 003 Wednesday (Lec), 1:00 – 2:20 PM KUPF 210 Monday (Rec) 8:30 – 9:50 AM TIER 114

Office hours: To be Announced

Webex platform will be used for the synchronous online courses. Conference invitation messages for the office hours will be sent to your NJIT email addresses.

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
- **Mastering Physics Homework System:** Be sure that your textbook is sold bundled with a Mastering Physics student access code card. Each student must enroll in the course specified by his/her instructor. Homework assignments will be posted on-line. Students login, download and solve the assigned problems, and submit answers to the automated grading system.

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

COUNSELING AND ACADEMIC SUPPORT: The Center for Counseling and Psychological Services **is committed to assisting students experiencing high levels of personal challenge and stress.** If you need accommodations due to a disability please contact Associate Director of Disability Support Services.

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 4th 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, September 29 4:15 – 5:45 PM
- **Common Exam 2:** Wednesday, October 27 4:15 – 5:45 PM
- **Common Exam 3:** Wednesday, December 01 4:15 – 5:45 PM

HOMEWORK Homework assignments will be posted on-line using the Mastering Physics Homework System. Please register for your section using. login: www.masteringphysics.com. Course codes to register to homework classes : to be announced

LECTURE QUIZZES In-class quizzes covering the preceding or current work will be given during lectures and/or recitations at Canvas (<https://canvas.njit.edu>). Use your NJIT UCID and password to login.

The Lecture Quizzes scores count toward your final course grade. **There are no make-ups for in class activities.** Students missing a lecture 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 all three common exams (16% each)
- **32%** for the final exam
- **20%** for the total of homework plus short in-class quizzes plus participation measures.

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”

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 Sept.01 – Sept.06 | Elasticity, Density and Pressure, Fluids at Rest | Chapt. 9 Sect. 5-6 Chapt.10 Sect. 1-7 | p. 256 pr. 40, 45, 50 p. 285 pr. 2, 12, 14, 15, 23, 27, 34 | Intro |
| Week 2 Sept.07– Sept 13 | Fluids in Motion | Chapt. 10 Sect. 8-10 | p. 285 prob. 47, 48. 49, 50, 53, 80 | A |
| Week 3 Sept.14 – Sept. 20 | Temperature, Thermal Expansion, The Ideal Gas Law | Chapt. 13 Sect. 1-8 | p.385 prob. 5, 12, 15, 19, 24, 31, 39, 78 | 7 |
| Week 4 Sept. 21 – Sept. 27 | Specific Heat, Calorimetry, Latent Heat, | Chapt. 14 Sect. 1-5 | p.408 pr. 2, 13, 14, 25, 27, 34 | D |
| Week 5 Sept. 28 – Oct.04 | Transfer of Heat | Chapt. 14 Sect. 6 - 8 | p.408 pr. 38, 42, 43, 54 | E |
| Week 6 Oct. 05 – Oct.11 | Thermodynamics | Chapt. 15 Sect. 1-7 | p. 438 pr. 1, 18, 19, 24, 32 | F |
| Week 7 Oct. 12 – Oct. 18 | Simple Harmonic Motion, Waves, Standing Waves | Chapt. 11 Sect. 1-12 | p. 322 pr.3, 7, 8, 14,18, 27, 36, 37, 40, 49, 52 | G |
| Week 8 Oct. 19 – Oct. 25 | Sound | Chapt. 12 Sect.1-7 | p. 354 pr. 3, 4, 9, 14, 27, 28, 56, 63 | B1 |
| Week 9 Oct. 26 – Nov. 01 | Electric Charges, Electric Field, Electric Potential | Chapt.16 Sect.1-5, 7 Chapt. 17 Sect. 1-2 | p. 468 pr. 2, 3, 19, 21 p. 496 prob. 3, 4, 6, 9 | W |
| Week 10 Nov. 02 – Nov. 08 | Electric Current, Resistance, Electric Power | Chapt.18 Sect. 1-7 | p.521 pr.1, 9, 13, 17, 28, 37, 47, 54 | J |
| Week 11 Nov. 09 – Nov. 15 | Electric Circuits | Chapt.19 Sect. 1- 5, 7 | p. 552 pr. 1, 4, 12, 15, 16, 77 | H |
| Week 12 Nov. 16 – Nov. 22 | Light: Reflection, Mirrors, Refraction | Chapt. 22 Sect. 3-4 Chapt. 23 Sect. 1-3 | p. 673 pr. 4, 9, 12, 25, 26, 28, 29, 72 | 215 |
| Week 13 Nov. 23 – Nov. 29 | Light: Total Internal Reflection, Lenses | Chapt. 23 Sect. 4-8 | p. 673 pr. 35, 36, 41, 43, 47, 48 | M |
| Week 14 Nov. 30 – Dec. 06 | 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 | N |
| Week 15 Dec. 07 – Dec. 10 | REVIEW FOR FINAL | | | |

IMPORTANT DATES:

SEPTEMBER 06, LABOR DAY

SEPTEMBER 08 , WEDNESDAY FOLLOWS MONDAY SCHEDULE

THANKSGIVING RECESS – NOVEMBER 25-NOVEMBER 28

READING DAY - DECEMBER 13

READING DAY - DECEMBER 14

FINAL EXAM PERIOD – DECEMBER 15 -21