NJIT New Jersey Institute of Technology

Jordan Hu College of Science and Liberal Arts

DEPARTMENT OF PHYSICS

COURSE OUTLINE **PHYSICS 103** **Summer 2025**

Class Schedule

Day and Time: **9:00 AM - 11:50 AM**
Room: **TIER 107**
Delivery Mode: Face-to-Face (Delivery of instruction is structured around in-person classroom meeting times. Instruction is delivered in person and students are expected to attend class).

Instructor Information

Instructor: **Dr. Ilya Kuzichev**
Office: TIER 202
Office Hour: Wed 12pm-2pm
E-Mail: ilya.kuzichev@njit.edu

General Information

- Description: Physics 103 is an algebra-based physics introductory college-level physics course in which students explore fluid statics and dynamics; thermodynamics; simple harmonic motion and waves; electrostatics; electrical circuits with capacitors; electromagnetism; reflection, mirrors, refraction, interference and diffraction. Through inquiry-based learning, students develop scientific critical thinking and reasoning skills.
- **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.

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.

Course material:

- **Textbook***:* "Physics: Principles with Application, Seventh Edition by Douglas C. Giancolli, 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 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 accommodation due to a disability please contact Associate Director of Disability Support Services.

Help

Students are encouraged to take advantage of their instructor's scheduled office hours for academic support. Additional assistance is also available through the Physics Tutoring Center, located in FMH 110.
In-person tutoring will be offered from **Wednesday, July 9 through Thursday, August 7, 2025**, during the following times:
Days: Monday, Wednesday, and Thursday
Hours: 12:00 PM – 6:00 PM
No appointment is necessary; students are welcome to drop in during any of the open sessions.

Homework

It is almost impossible to succeed in this course without working a lot of problems: do the homework. Each student must download the weekly homework assignments from Mastering Physics online homework system, work the problems, and submit the solutions online before each assignment is due. Late work will not be accepted. See Course Materials section above.
Homework assignments will be posted on-line using the Mastering Physics Homework System. Please register for your section using. login: www.masteringphysics.com.

Course code to register to homework class: to be announced.

For your own reference, record the unique course identifier announced by your instructor, and your login ID and password. Instructors cannot access forgotten logins or passwords.

- **Verify Enrollment Duration: During the registration process, double-check the duration of your enrollment to ensure that it covers the entire duration of the semester.**

- **Homework assignments must be submitted by the due date, and extensions will only be granted with a valid justification approved by the Dean of Students Office. It is your responsibility to regularly check the status of Pearson assignments, including their availability and due dates.**

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.

Grading

Final Letter Grades:

- 16% Exam 1
- 16% Exam 2
- 32% Final Exam
- 16% Homework
- 20% Quizzes

The cutoff percentages for various letter grades will be:

Percentage	Letter Grade
≥ 85%	A
≥75 %	B+
≥65 %	B
≥56 %	C+
≥50 %	C
≥45 %	D
< 45	F

Final grades are not negotiable: A score of 84.99% is a B+, not an A.

Exams

- Exam 1 and Exam 2
- In class Lecture Quizzes (during recitation period, be prepared to have canvas app on phone, iPad or laptop. Note: Quizzes taken remotely will be disregarded and counted against you).

- Comprehensive Final Exam 2.5 hours long

The final exam will emphasize the work covered after exams 1 and 2, but also re-caps the whole course.

Exam 1 & 2 and Final Exam are scheduled to be taken in person.

No online Exams will be provided.

Note: Exams are all going to be Multiple-Choice questions. Students are going to submit exam questions and scantron cards to be collected at the end of each exam. There is not going to be any partial credit for multiple-choice questions, however students are required to show work to support their answers.
It is the student's responsibility to take the exam in the class that is scheduled.

In-class 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 a quiz will receive a grade of zero for that item.

Missed Exams

The general policy is that students who miss a 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 exams automatically fail the course. Students who anticipate an absence from a exam should discuss their situation with the Dean of Students PRIOR TO their absence. In order to be qualified to receive an "excused absence" for the exam (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, the student should present this document to the **Dean of Students - (973) 596-3466, Central King Building (CKB), Room L71 (Lower Level)** for evaluation. BOTH the Physics 121 instructor and Dean of Students must concur in permitting an "excused absence" for the exam. Students who miss exams that do not present documentation within 7 days of the exam will receive a score of zero for the exam.

In the event that the above qualification is met, a separate make-up test for the missed quiz will not be offered. Instead, the final exam grade will be considered for giving a grade for the missed test.

Course Policies

It is expected that NJIT's University Code on Academic Integrity will be followed in all matters related to this course.

"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: https://www.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"*

- Students are required to agree to the NJIT Honor Code on each exam.
- Please do not eat, drink, or create noise in class that interferes with the work of other students or instructors.
  Interfering with an instructor's ability to conduct the class or the ability for other students to learn is considered as "Disruptive Conduct".

  The use of any internet services other than following the instructor's course notes and e-textbook is disruptive for the instructor and the other students.

- Turn off all phones, wireless devices, laptops, and messaging devices of all kinds during classes and exams.

- Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.

- **Student recordings**: Unauthorized student recordings of class sessions are prohibited. If a student needs to record a class because of accommodation, they need to reach out to the Office of Accessibility Resources and Services (OARS).
  https://www.njit.edu/registrar/njit-policy-recording-classes

- If the student cannot be continuously present in the exam room for the entire duration of the scheduled exam for any physical/medical reason, the student needs to seek accommodation through OARS in order to take the exam separately.

- Needless to say, do not contact any "tutoring services" for help during an exam.

Physics 103 Class Schedule for Summer 2025

	Topic	Text Study	Recommended Problems
Day 1 July 09	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, 19, 23, 27, 34
Day 2 July 10	Fluids in Motion	Chapt. 10 Sect. 8-10	p. 285 prob. 47, 48. 49, 50, 53, 80
Day 3 July 14	Temperature, Thermal Expansion, The Ideal Gas Law	Chapt. 13 Sect. 1-8	p.385 prob. 5, 12, 15, 19, 24, 31, 39, 78
Day 4 July 16	Specific Heat, Calorimetry, Latent Heat,	Chapt. 14 Sect. 1-5	p.408 pr. 2, 13, 14, 25, 27, 34
Day 5 July 17	**Exam 1 9:00-10:15 AM** Transfer of Heat	Chapt. 14 Sect. 6 - 8	p.408 pr. 38, 42, 43, 54
Day 6 July 21	Thermodynamics	Chapt. 15 Sect. 1-7	p. 438 pr. 1, 18, 19, 24, 32
Day 7 July 23	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
Day 8 July 24	Sound	Chapt. 12 Sect.1-7	p. 354 pr. 3, 4, 9, 14, 27, 28, 56, 63
Day 9 July 28	Electric Charges, Electric Field **Exam 2 9:00-10:15 AM**	Chapt.16 Sect.1-5, 7	p. 468 pr. 2, 3, 19, 21 p. 496 prob. 3, 4, 6, 9
Day 10 July 30	Electric Potential Electric Current	Chapt. 17 Sect. 1-2 Chapt.18 Sect. 1-3	p.521 pr.1, 9, 13, 17, 28, 37, 47, 54
Day 11 July 31	Resistance, Electric Power	Chapt.18 Sect. 4-7	p.521 pr.1, 9, 13, 17, 28, 37, 47, 54
Day 12 Aug 04	Electric Circuits	Chapt.19 Sect. 1- 5, 7	p. 552 pr. 1, 4, 12, 15, 16, 77
Day 13 Aug 06	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
Day 14 Aug 07	Light: Total Internal Reflection, Lenses Interference, Diffraction Grating, Resolution	Chapt. 23 Sect. 4-8	p. 673 pr. 35, 36, 41, 43, 47, 48
Day 15 Aug 11	**Final Exam 9:00 AM – 11:30 AM**		

*** The professor will discuss changes to the syllabus during class if they arise.**

Second Summer Session: July 8, 2025 - August 11, 2025

Jul	8	Second Summer Session Begins
Jul	11	Last day to Add/Drop for Second Summer Session
Jul	11	100% Refund Ends
Jul	12	W Grades Posted for all Withdrawals from Second Summer Session
Jul	12	80% Refund Begins
Jul	13	80% Refund Ends
Jul	14	60% Refunds Begins
Jul	15	60% Refund Ends
Jul	16	40% Refund Begins
Jul	17	40% Refund Ends
Jul	18	20% Refund Begins
Jul	19	20% Refund Ends
Jul	22	Last day to withdraw from a class in Second Summer Session
Aug	11	Last Day of Classes – Second Summer Session
Aug	14	Final Grades Due