

Summer 2022

PHYS 102-011: General Physics

George Georgiou

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Course Outline
Physics 102 011 (and 102A)
Summer 2022

Dr. George Georgiou

207 Microelectronics (in bridge between ECE and FMH)

georgiou@njit.edu (preferred contact method outside class)

Lecture and recitation for Section 011

MWR 9-12

Tier 112

Office hours: After class or by appointment

Pre- and Co-requisite Courses

Prerequisite: Satisfactory completion of two high school mathematics courses and two high school science courses.

Laboratory - Physics 102A

The laboratory component of the course is Phys 102A. This laboratory course may be optional for your major; confirm it with your department. If it is required for your major, it must be taken concurrently unless you have previously taken and passed Phys 102A. The grading for the laboratory is separate from the course/recitation (Phys 102) and the grades are given by the laboratory instructors. Latest edition of **Lab manual “Physics 102A Laboratory Manual”** can be purchased from NJIT Bookstore.

YOU MUST REGISTER FOR THE LECTURE/RECITATION (Phys 102) AND THE LABORATORY COURSE (Phys 102A) SEPARATELY. WITHDRAWAL FROM ANY OF THESE WILL CAUSE A SIMULTANEOUS WITHDRAWAL FROM ALL Phys 102 COURSES.

Course Materials

Textbook:

Physics - Principles with Applications, 7th ed. by Giancoli (Publisher: Pearson)

Alternatively, you can read your chosen college level physics book.

Mastering Physics Online Homework System:

Be sure that your textbook is sold bundled with a Mastering Physics student access code card.

You can also buy the student access code card separately either from NJIT bookstore or online.

Homework assignments will be posted on-line. Students login, download and solve the assigned problems, and submit answers to the automated grading system. Instructions can be found on the student access code card. Alternatively, you can buy the mastering physics access key card online.

Log into mlm.pearson.com and follow instructions to register. Enroll for this section of the course, use course ID “georgiou51684”.

Online Class Response System:

I will NOT use **Clickers**. Rather I will use the in-class quiz (workout problems) to monitor progress.

Email:

NJIT email will be routinely used for announcements and to distribute material. Be sure check the NJIT email every day.

Attendance

Attendance at lectures and recitations is mandatory; it may constitute a portion of the final grade. Missing more than three lectures will be reported to the Dean of Freshman Studies throughout the semester and can result in failing the course. Students with absences need to discuss their extenuating circumstances for missing the classes with the Dean.

COVID-19 Policy

Students must follow the rules set by NJIT regarding COVID-19.

Exams

There will one Midterm Exam and a Final Exam during the term. The exam schedule is:

Midterm Exam: M 6/13

Comprehensive Final Exam last day of class R 6/23, 2.5 hours long

There will be no makeup exams.

Grading

Final grades will be based on a composite score for the term's work as follows:

- **28%** for the Midterm Exam
- **32%** for the final exam
- **20%** for the total of homework work
- **20%** for Algebra Quiz + Lecture Quizzes + Class participation

Active class participation and doing at least the minimum assigned homework are necessary. Points will be deducted for lateness, creating noise, not following COVID-19 rules, or otherwise interfering with class work.

The cutoff percentages for various letter grades will be in the range of 84.0% for A, 76.0 % for B+, 68.0% for B, 60.0% for C+, 52.0% for C, 44.0% for D, F below 44.0 %.

C or better grade is required to take further physics courses. If you get D in Physics 102, you cannot take the next level physics course.

Reading Assignments

The text readings are listed below. You should read the assigned sections of the text before the lecture covering that material

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. Typically, the homework is due before the next class. Late work will not be accepted. See Course Materials section above.

Honor Code Violations or Disruptive Behavior

NJIT has a zero-tolerance policy for cheating of any kind and for student behavior that disrupts learning by others. Incidents will be immediately reported to the Dean of Students. The penalties for violations range from a minimum of failure in the course with disciplinary probation up to expulsion from NJIT. Avoid situations where your own behavior could be misinterpreted, even if it is honorable. Students are required to agree to the NJIT Honor Code on each exam. Turn off all cellular phones, wireless devices, computers, and messaging devices of all kinds during exams. Please do not create noise in class that interferes with the work of students or instructors.

Help

Students are encouraged to meet with their instructor during their office hours. The Physics Department does not offer tutoring for summer courses.

Learning Outcomes:

For this course, you can expect to be assessed on the following learning outcomes:

1. Recall the definitions and relationships involving position, velocity, speed, acceleration, vectors, Newton's Laws, circular motion, free-body diagrams, friction, work, energy, linear and angular momentum, torque, angular velocity and acceleration, and gravitation.
2. Apply the equations governing 1-D and 2-D constant acceleration to mechanical systems for various initial conditions. Calculate unknown quantities based on physical relationships, initial conditions, and known quantities.
3. Comprehend the meaning of the equations governing net force and acceleration (Newton's Laws), and be able to manipulate them in conjunction with a free-body diagram to obtain any desired quantitative relationship. Understand the extension of these equations to rotational motion, and gravitation.
4. Generalize the concepts underlying the equations of motion, such as work, kinetic and potential energy, conservation of energy, and equilibrium.
5. 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.
6. 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.

2022 Summer Course Schedule for Phys 102_011 --- MWR 9am, T112

Dates	Lecture Topics	Text Reading
M 5/23	Math Review, Introduction Measurement and Units	Appendix A-4, Ch 1, Sec 1-6
W 5/25	Motion in One Dimension	Ch 2, Sec 1-8
R 5/26	Vectors and Two-Dimensional Motion	Ch 3, Sec 1-6
W 6/1	The Laws of Motion - Forces and Newton's Laws	Ch 4, Sec 1-5
W 6/1 R 6/2	The Laws of Motion - Applications of Newton's Laws	Ch 4, Sec 6-8
R 6/2	Circular motion, Law of Gravity	Ch. 5, Sec. 1, 2, 4 Ch. 5, Sec. 5-7
M 6/6	Energy -Work, Kinetic Energy, Work-Energy Theorem	Ch. 6, Sec. 1, 3
W 6/8	Energy -Potential Energy, Mechanical Energy, Energy conservation, Power	Ch. 6, Sec. 4-7, 9, 10 (excluding spring)
=====	=====	=====
R 6/9	Momentum and Collisions, Momentum and Impulse, Conservation of Momentum	Ch. 7, Sec 1-3
M 6/13	Midterm Exam	Math Review, Ch. 1 - Ch. 3.6, Ch. 4, Ch.5.1-Ch.5.4, Ch.6.1, Ch.6.3
W 6/15	Momentum and collision	Ch. 7, Sec.4-8,10
R 6/16	Rotational Motion, Rotational Dynamics I	Ch 8, Sec 1-3
M 6/20	Rotational dynamics II	Ch.8, Sec. 4-8
W 6/22	Static Equilibrium	Ch. 9, Sec. 1-4
R 6/23	Final Exam	Everything learned in class

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

*** Class ppt presentation will be available to class.**

NOTE: NO Class M5/30 (Memorial Day)

Since most students enroll in the lab course, I attach the labs on next page.

2022 Summer Laboratory Schedule for Phys 102A_011 ----- 1pm, T408

Dates	Lab Topic	Lab # and due date
M 5/23	Intro, Error Analysis	
W 5/25	Motion Graph	
R 5/26	One Dimensional Motion	
W 6/1	2-D Projectile Motion	
R 6/2	Newton's 2 nd Law	
M 6/6	Atwood Machine	
W 6/8	Friction– Static and Dynamic Coefficients	
R 6/9	Centripetal Forces	
=====	=====	=====
M 6/13	Conservation of Energy on Inclined Plane	
W 6/15	Conservation of Momentum and Impulse	
R 6/16	Torque, Rotational Energy	
M 6/20	Conservation of Angular Momentum	
W 6/22	Static Equilibrium Translational (Force Table)	
R 6/23	Static Equilibrium Rotational (Strut)	

NOTE: N) lab M 5/30 (Memorial Day)

The summer1 calendar is attached on the next page.

First Summer Session: May 23, 2022 - June 27, 2022

May	23	First Summer Session Begins
May	25	Last Day to Add/Drop for First Summer Session
May	25	Last Day for 100% Refund
May	26	W Grades Posted for all Withdrawals from First Summer Session;
May	26	80% Refund Begins
May	29	80% Refund Ends
May	30	Memorial Day - No Classes Scheduled. University Closed
May	30	60% Refund Begins
June	1	60% Refund Ends
June	2	40% Refund Begins
June	4	40% Refund Ends
June	5	20% Refund Begins
June	7	20% Refund Ends
June	11	Last Day to Withdraw from a class in First Summer Session
June	17	Juneteenth Holiday - No Classes Scheduled. University Closed
June	27	Last Day of Classes, Last day for this class is June 23
June	30	Final Grades Due