

Summer 2020

## PHYS 102-450: General Physics

Keun Hyuk Ahn

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**Syllabus**  
**Physics 102 Sect. 450**  
**Summer 2020**

Prof. Keun Hyuk "Ken" Ahn  
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Lecture and recitation: Online  
Tuesdays, Wednesdays, Thursdays, 9am – noon

Online office hour via Webex: 10am-10:25am, 10:30am-10:55am on Fridays  
(Email me by 5pm Thursday with any time constraint you may have.)

Course website: On Canvas. Login in through <https://canvas.njit.edu/>

**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 Lab Manual”** can be purchased from NJIT Bookstore Website <https://www.bkstr.com/njitstore/home>

**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)

**Mastering Physics Online Homework System:**

You may buy your textbook bundled with a Mastering Physics student access code card. You can also buy the student access code separately online at <https://www.pearsonmylabandmastering.com/northamerica/masteringphysics/> and have an immediate access to Online Homework System. Homework assignments will be posted online. Students login, download and solve the assigned problems, and submit answers to the automated grading system. Instruction can be found on the student access code card. **To enroll for this section of the course, use course ID “MPAHN4690901”.**

**Online Class Response System:**

We will use an **online** class response system called “**iClicker REEF**”. The iClicker quizzes must be answered with **iClickers REEF app on iPhone/Android phone/computer only. Physical iClickers cannot be used.** For those of you with **iPhone or Android Phone**, you can download an app “**iClicker REEF**” for your iPhone or Android Phone, and buy a subscription, which will turn your iPhone or

Android Phone into an iClicker. Alternatively, you can sign into the iClicker Reef web app from your laptop, tablet, or smartphone, and buy a subscription. Either way, you have to buy a **paid subscription, instead of using it as a free trial**. Consult the iClicker web page <https://www.iclicker.com/> for details. You will need **the school zip code, 07102**.

**Email:**

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

**Computer:**

**During school closure, access to a computer with high speed internet connection, webcam (internal or external), microphone and audio (internal or external), and Windows/Mac operating system is required. (Webcam and Windows/Mac operating system are for online exam.)**

**Canvas:**

Canvas is used for the main course website.

Login through <https://canvas.njit.edu/>

**Webex:**

During school closure, lecture/recitation will be given with Webex.

Check information on <http://ist.njit.edu/webex/>

**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.

**Exams**

There will be two Common Exams and a Final Exam during the term. The exam schedule is:

Common Exam 1: Thursday, May 28, 9 am – noon

Common Exam 2: Thursday, June 11, 9 am – noon

Final Exam: Thursday, June 18, 9 am - noon

There will be no makeup exams.

**Due to school closure, all exams will be given remotely through online. Students need access to a computer with high speed internet connection, webcam (internal or external), microphone and audio (internal or external), and Windows/Mac operating system.**

**Grading**

Final grades will be based on a composite score for the term's work that includes Common Exam 1, Common Exam 2, the Final exam, homework score, iClicker REEF quiz, and class participation. The approximate weights we expect to use in calculating the composite score are:

- 27 % for Common Exam 1
- 27 % for Common Exam 2
- 27 % for Final Exam
- 12 % for Homework grade
- 7 % for iClicker REEF quiz + Class participation

Extra credit may be given for active class participation, etc. Negative credit may be applied for lateness, creating noise, 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. 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. Physics Department also offers tutoring as posted on <http://physics.njit.edu/>, for which students do not need to sign up but just can go to open sessions provided in the schedule.

### **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.
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.

**2020 Summer Course Schedule for Phys 102-002**

<b>Dates</b>	<b>Lecture Topics</b>	<b>Text Reading</b>
5/19 Tue	Algebra Review, Introduction Measurement and Units	Appendix A-4, Ch 1, Sec 1-6
5/20 Wed	Motion in One Dimension	Ch 2, Sec 1-8
5/21 Thu	Vectors and Two-Dimensional Motion	Ch 3, Sec 1-6
5/26 Tue	The Laws of Motion - Forces and Newton's Laws	Ch 4, Sec 1-5
5/27 Wed	The Laws of Motion - Applications of Newton's Laws	Ch 4, Sec 6-8
<b>5/28 Thu</b>	<b>Common Exam 1 (9 am – noon)</b>	<b>Algebra, Ch1 – Ch4.5</b>
6/2 Tue	Circular motion	Ch. 5, Sec. 1, 2, 4 (excluding highway curves)
6/3 Wed	Energy -Work, Kinetic Energy, Work-Energy Theorem	Ch. 6, Sec. 1, 3
6/4 Thu	Energy -Potential Energy, Mechanical Energy, Energy conservation, Power	Ch. 6, Sec. 4-7, 9, 10 (excluding spring)
6/9 Tue	Momentum and Collisions -Momentum, Impulse, Conservation of Momentum, Collision	Ch. 7, Sec. 1-8, 10
6/10 Wed	Rotational Motion, Rotational Dynamics I	Ch 8, Sec. 1-3
<b>6/11 Thu</b>	<b>Common Exam 2 (9 am – noon)</b>	<b>Ch4.6 – Ch.7.10</b>
6/16 Tue	Rotational dynamics II	Ch.8, Sec. 4-8
6/17 Wed	Static Equilibrium	Ch. 9, Sec. 1-4
<b>6/18 Thu</b>	<b>Final Exam (9am – noon)</b>	<b>Everything covered in class</b>

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