

# Physics 102 FALL 2017 Course Syllabus

## General Physics (COAD)

### Instructor:

- Dr. Jan Opyrchal, <mailto:jan.opyrchal@njit.edu>, (973) 596-3683, TIER 410,

**Office hours: Monday 8.30 AM - 10.00 AM, Tuesday 3 PM - 4.30 PM - my office or room 403B FMH or by appointment (send e-mail).**

### Pre-requisites and Co-requisites:

- Satisfactory completion of two high school mathematics courses.
- This section is for students from the College of Architecture and Design.

### Physics 102A Laboratory:

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 for Physics 102:

- **Primary text :**

**"Physics: Principles with Applications, 7<sup>th</sup> edition" by Douglas C. Giancolli, Prentice Hall, ISBN-13: 978-0-321-62592-2**

Paper copy is available. An electronic copy can also be purchased or rented.

This textbook contains both Physics 102 and Physics 103

- **Mastering Physics Online Homework System:** <https://www.masteringphysics.com/site/login.html>

Homework: It is almost impossible to succeed in physics courses without working a lot of problems. Do the homework. Remember that homework is 11% of your final grade.

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 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 "PHYS102S003FALL17".**

I can't recover your passwords - so please keep them recorded.

- Late work will not be accepted.
- **Classroom Response System called "iClickers":** Each student needs an "iClicker" (about \$40 at the bookstore, \$15-\$20 from Ebay. All used models are OK). Bring your clicker to each class. Make sure your clicker has a legible ID code (an 8 character hexadecimal number) on its back surface; sometimes they become illegible. If you can't find the number but the iClicker works - I may recover the number.
- **moodle.njit.edu:** I post presentationS, problems, old exams, grades, etc. on moodle.njit.edu. So check there often.  
To view the PowerPoint presentations I post you must use microsoft Power Point software. Google equivalent doesn't work correctly with my presentations.

## **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.

**Examinations:** There will be three exams and a comprehensive Final Exam during the term. The exam schedule is:

- **Common Exam 1:** Wednesday 10/4/17 4:15 – 5:45 PM,
- **Common Exam 2:** Wednesday, 11/1/17 4:15 – 5:45 PM
- **Common Exam 3:** Wednesday, 12/6/17 4:15 – 5:45 PM
- **Final Exam to be announced**

**In-class quizzes** covering the preceding or current work will be given during lectures. **The Iclicker system** is used to collect the answers. The grades count toward your final course grade. There will be no make-up quizzes and normally no make-up common exams.

**Final Grades** will be based on a **composite score** for the term's work that includes each common exam score, the final exam, in-class quizzes, and the term's homework score. Here are the approximate weights to be used for calculating the composite score:

- **48% -- Exam 1+2+3 (16% each)**
- **33% -- Final Exam**
- **11% -- Homework**
- **8% -- Lecture Quizzes**

Letter grades will be assigned as follows:

**A >80%    B+ ≥ 76%-79%    B ≥ 68%-75%    C+ ≥ 60%-67%    C ≥ 52%-59%    D ≥ 44%-51%    F < 44%**

**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/students/>.

**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. Violations will be reported to the Dean of Students. The penalties range from a minimum of failure in the course plus disciplinary probation up to expulsion from NJIT. Avoid situations where your own behavior could be misinterpreted as dishonorable. **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 classes and exams.

**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.

**2017 Fall Course Schedule for Phys 102-001 and 102-003**

<b>Dates</b>	<b>Lecture Topics</b>	<b>Text Reading</b>
Week 1 09/04 - 09/08	Introduction Measurement and Units	Ch 1, Sec 1-6
Week 2 09/11 - 09/15	Motion in One Dimension	Ch 2, Sec 1-8
Week 3 09/18 - 09/22	Vectors and Two-Dimensional Motion	Ch 3, Sec 1-6
Week 4 09/25 - 09/29	The Laws of Motion - Forces and Newton's Laws	Ch 4, Sec 1-5
Week 5 10/02 - 10/06	The Laws of Motion - Applications of Newton's Laws	Ch 4, Sec 6-8
Week 6 10/09 - 10/13	Circular motion	Ch. 5, Sec. 1-4
Week 7 10/16 - 10/20	Energy -Work, Kinetic Energy, Work-Energy Theorem	Ch. 6, Sec. 1- 3
Week 8 10/23 - 10/27	Energy -Potential Energy, Mechanical Energy, Energy conservation, Power	Ch. 6, Sec. 4-7, 9, 10
Week 9 10/30 - 11/03	Momentum and Collisions -Momentum, Impulse, Conservation of Momentum	Ch. 7, Sec. 1-3
Week 10 11/06 - 11/10	Momentum and Collisions -Collisions	Ch 7, Sec. 4-8, 10
Week 11 11/13 - 11/17	Rotational Motion, Rotational Dynamics I	Ch 8, Sec 1-3
Week 12 11/20 - 11/24	Rotational dynamics II	Ch.8, Sec. 4-8
Week 13 11/27 - 12/01	Static Equilibrium	Ch. 9, Sec. 1-4
Week 14 12/04 - 12/08	Gravitation	Ch 5, Sec. 5-8
Date to be announced	Final Exam	Everything learned in class

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

***IMPORTANT DATES***

<http://www.njit.edu/registrar/calendars/>

September	11	Monday	Last Day for 100% Refund, Full or Partial
November	6	Monday	Last Day to Withdraw
November	21	Tuesday	Thursday Classes Meet
November	22	Wednesday	Friday Classes Meet
November	23	Thursday	Thanksgiving Recess Begins
December	13	Wednesday	Last Day of Classes
December	14	Thursday	Reading Day
December	15	Friday	Final Exams Begins