

# Spring 2017 Physics 121 Course Syllabus (Rev. 1.0)

## ***Instructors:***

- Rich Janow: T-423B, [janow@njit.edu](mailto:janow@njit.edu), (973) 596-3549, <http://web.njit.edu/~janow>
- Slawomir Piatek: T-423F, [slawomir.piatek@njit.edu](mailto:slawomir.piatek@njit.edu), (973) 596-3551
- Ken Chin: T-460: [ken.k.chin@njit.edu](mailto:ken.k.chin@njit.edu), (973) 596-3297
- Benjamin Thomas: T-423E, [benjamin.thomas@njit.edu](mailto:benjamin.thomas@njit.edu)
- Andres Jerez: T-455, [andres.jerez@njit.edu](mailto:andres.jerez@njit.edu), (973) 596-3531
- Farbod Mahmoudinobar: [fm59@njit.edu](mailto:fm59@njit.edu)

Office hours will be posted on instructor's schedules. Other times by appointment

## ***Pre-requisites (all with grade of C or better):***

- Physics 111 or 111H, and Math 111, 111H, or Math 132 (Calculus-I).

## ***Co-requisites:***

- Physics 121A (the lab course) and Math 112 (Calculus-II).

***Physics 121A Laboratory*** must be taken along with Physics 121 unless you passed it previously. **If you drop Physics 121 you automatically drop the lab (and vice versa, no exceptions).** The Lab is otherwise a totally separate course from Physics 121 in that the lab instructors set the requirements and grades. The lab manual (Physics 121A Laboratory Manual 7th Edition) should be purchased at the bookstore. The most up-to-date lab schedule will be posted at <http://web.njit.edu/~smm8166>.

## ***Materials for Physics 121:***

- **Textbook (Abbreviation: Y&F): "University Physics", 13th Edition**, authors **Young & Freedman** (Pearson 2012). We use Chapters 21 to 31, which are published as bound books plus a 3 hole binder and E-text version.
- **We will not be using the 14<sup>th</sup> Edition of the text.** The NJIT bookstore will have Edition 13 used or new.
- **Mastering Physics Online Homework System:** Each student must obtain an access code kit that allows use of the online homework system. In addition to using the access code, each student must enroll in the Mastering Physics (MP) course for his/her Physics 121 section using a course identifier code to be supplied by each instructor.
- Homework assignments and tutorials posted on-line in Mastering Physics will be automatically graded. Specific information will be available directly from all the instructors, and/or their web sites.
- The NJIT bookstore will stock Volume 2 of the text (chaps 21-37 bound with the access code and E-text kit - **ISBN = 0321928814 or 9780321928818**). Any other version of the text containing Chapters 21 – 31 is OK. Any access code kit bought separately must be for the right text, specified above, so check before you buy.
- **Classroom Response System called "iClickers":** Each student needs an "iClicker" (about \$40 at the bookstore). All used models are OK). Bring your clicker to each class. Some older used clickers have illegible ID's (an 8 character string on the back) so check before you buy.
- **Web Sites:** Instructors may post lecture notes, problems, grades, etc. on their web sites. So check there often.

***Learning Outcomes:*** This course is the second of the calculus-based introductory Physics series.

- You can expect to have learning outcomes assessed by means of 3 common exams, a final exam, scores on homework assignments, in-class quizzes, and a small class participation score.
- The principal learning outcome is to demonstrate understanding and mastery of classical electricity and magnetism up to AC circuits, not including Maxwell's Equations or beyond. The subject matter areas you will be assessed on include electric charge, electric and magnetic fields, forces on stationary and moving charges and currents due to electrostatic and magnetic fields, electrostatic potential and potential energy, Gauss' Law, capacitance, current, resistance, DC circuits, the Biot-Savart Law, Ampere's Law, Faraday's Law, inductance, RC circuits, LR circuits, LCR circuits, AC circuits including Phasor diagrams and resonant oscillations.
- In any/all of the above subject areas, you should be able to:
  - recall and use the conceptual and mathematical definitions and be able to explain them.
  - explain the conceptual and mathematical relationships between quantities used.



- **Students are required to agree to the NJIT Honor Code on each exam.**
- **Turn off all phones, wireless devices, laptops, and messaging devices of all kinds during classes and exams.**
- Please do not eat, drink, or create noise in class that interferes with the work of other students or instructors.

**The schedule on page 4** lists the topics covered, text readings, and homework assignments week by week throughout the term. Some of the information may be tailored to your own class's schedule. Do the homework problems: it is almost impossible to succeed in physics courses without working a lot of problems.

Each work unit begins with a lecture and includes a related homework assignment and perhaps some (optional) tutorials. These are usually covered in recitation class and latest submit date is about a week after material is covered in lecture.

- Read the assigned sections of the text before the lecture covering that material.
- Read the instructor's lecture notes before class (if provided) and bring them to class.
- Work on homework problems before they are covered in recitation and certainly before they are due.
- The Mastering Physics online system shows the applicable homework due dates.
- **Students who do not submit homework are automatically lowering their average by 12 - 16%.**

Two sets of solved practice problems are posted for each week (the practice problems are old homework assignments from earlier textbooks). They are designated generically as **PP01** for week 01, **PP02** for week 02, etc

- One posted set of solved practice problems is called **HR01, HR02, etc.**
- A second solved practice problem set is the **Spring 2013 homework solutions**, posted in the same place.

The url is: [http://web.njit.edu/~janow/Physics 121 Fall2016/Phys 121Janow Fall2016.html](http://web.njit.edu/~janow/Physics%20121%20Fall2016/Phys%20121Janow%20Fall2016.html).

**Page 5** lists the preliminary homework assignment starting dates and due dates for Sections 002, 004, 010, and 012. The dates pertaining to other sections may be different, and all are subject to change if needed as the term unfolds.

**Specific information for the Mastering Physics (MP) homework system:** You will have to create an account on the MP system if you do not have one already. You can not sign up for the course your instructor sets up on MP until you have a valid Mastering Physics access code. So acquire one early and contact your instructor if this is a problem. Your instructor will announce a Mastering Physics course identifier for you to use when enrolling in your specific class. Use your NJIT email address as the logon ID for your account..

- The Mastering Physics login is <http://www.masteringphysics.com>. Click on "Student" in the upper left of the box. Respond "yes" that you have an access code (create an account if you do not already have one). Input your name exactly as it appears on NJIT's records: last name first, followed by a comma and your first and possibly middle name. Likewise, enter your 9 digit NJIT ID where indicated. For your own reference, record the unique course number announced by your instructor, and your Login ID and Password.
- Instructors cannot access forgotten logins or passwords.

**Physics 121 Syllabus for Spring 2017** (Rev. 1.0)  
**with Assignments Schedule for Sections 002,004,010,012**

\*\* PP = Practice Problems (see <http://web.njit.edu/~janow> then navigate )

Lecture Classes and Topics Weeks run from Tues AM to Mon PM	Text (Y&F) Readings	Assignments & Recitation Topics** (exact due dates to be announced)	Labs
<b>Monday, January 16</b>	<b>No Class</b>	<b>M. L. King Holiday</b>	
<b>Week 01 (Jan 17 to Jan 22)</b> Lecture 01: Vectors, Intro to Fields	Instr. Notes	Begin HW01 Use recitations for Lecture 01	<b>INTRO MATLAB 1</b>
<b>Week 02 (Jan 23 to Jan 29)</b> Lecture 02: Electric Charge & Force	Sec. 21.1 – 3	Begin HW02, PP02 Recitations: HW01/02 Joint Session	<b>MATLAB II</b>
<b>Week 03 (Jan 30 to Feb 05)</b> Lecture 03: Electric Field	Sec. 21.4 – 7	Begin HW03, PP03 Recitations: HW03.	<b>201</b>
<b>Common Exam 1: February 06</b> <b>Monday, 04:15 – 5:45 P. M.</b>		<b>Covers Lectures &amp; HW 01, 02, 03</b> <b>Vectors &amp; Fields + Ch. 21</b>	
<b>Week 04 (Feb 06 to Feb 12)</b> Lecture 04: Gauss' Law	Sec. 22.1 – 5	Begin HW04, PP04 Recitations: HW04.	<b>202</b>
<b>Week 05 (Feb 13 to Feb 19)</b> Lecture 05: Electric Potential	Sec. 23.1 – 5	Begin HW05, PP05 Recitations: HW05.	<b>203</b>
<b>Week 06 (Feb 20 to Feb 26)</b> Lecture 06: Capacitance	Sec. 24.1– 6	Begin HW06, PP06 Recitations: HW06.	<b>205</b>
<b>Week 07 (Feb 27 to Mar 05)</b> Lecture 07: Current, Resistance, DC Circuits, Intro to Kirchoff's Rules	Sec. 25.1 - 5, Sec. 26.1 – 2	Begin HW07, PP07 & PP08A Recitations: HW07.	<b>215</b>
<b>Common Exam 2: March 06</b> <b>Monday, 04:15 – 5:45 P. M.</b>		<b>Covers Lectures &amp; HW 04, 05, 06, 07</b> <b>Chapters 22, 23, 24, 25, &amp; 26.1</b>	
<b>Week 08 (Mar 06 to Mar 12)</b> Lecture 08: Multi-loop and RC Circuits	Sec. 26.2 – 5	Begin HW08, PP08B Recitations: HW08	<b>216</b>
<b>March 13 to March 19</b>	<b>No Class</b>	<b>Spring Break</b>	
<b>Week 09 (Mar 20 to Mar 26)</b> Lecture 09: Charges & Currents in Magnetic Fields	Sec. 27.1 – 8	Begin HW09, PP09 Recitations: HW09	<b>217</b>
<b>Monday March 27</b>		<b>Last Day to Withdraw</b>	
<b>Week 10 (Mar 27 to Apr 02)</b> Lecture 10: Sources of Magnetic Field. The Biot-Savart Law, Amperes Law	Sec. 28.1- 7	Begin HW10, PP10 Recitations: HW10	<b>212</b>
<b>Week 11 (Apr 03 to Apr 09)</b> Lecture 11: Faraday's Law of Induction	Sec. 29.1 – 5	Begin HW11, PP11 Recitations: HW11	<b>210</b>
<b>Common Exam 3: April 10</b> <b>Monday, 04:15 – 5:45 P. M.</b>		<b>Covers Lectures &amp; HW 08, 09, 10</b> <b>Chapters 26.2-5, 27, 28</b>	
<b>Week 12 (Apr 10 to Apr 16)</b> Lecture 12: Inductance, RL Circuits	Sec. 30.1 – 4	Begin HW12, PP12. Recitations: None this week No class on Good Friday Apr 14	<b>223</b>
<b>Week 13 (Apr 17 to Apr 23)</b> Lecture 13: LC & LCR Circuits, EM Oscillations, AC Circuits	Sec. 30.5 - 6 Sec. 31.1 – 2	Begin HW13, PP13/14 Recitations: HW12	<b>218</b>
<b>Week 14/15 (Apr 24 to May 01)</b> Lecture 14: AC Circuits, Resonance Use final lecture classes as Recitation 14	Sec. 31.3 - 6	Begin HW14 Recitations: HW 13, HW14	<b>221</b>
<b>Tuesday, May02 Friday Schedule</b>	<b>Last classes</b>	<b>No makeup class needed</b>	
<b>Reading Day: May 03 Wednesday</b>	<b>No classes</b>	<b>Optional Review Sessions</b>	
<b>Final Exam Period: May 04 -</b>		<b>Comprehensive final exam:</b> <b>Chapters 21 - 31</b>	

## Physics 121 Spring 2017 – Sections 002, 004, 010, 012 Only

### Preliminary Mastering Physics Homework Due Dates

- Assignments become available to students by 08:00 AM on corresponding lecture days.
- Last submissions are usually about a week later.

**Course IDs:   MPJANOW121002SP17**  
**MPJANOW121004SP17**  
**MPJANOW121010SP17**  
**MPJANOW121012SP17**

<b>Homework Assignment</b>	<b>Date Posted</b>	<b>Date Covered in Recitation Class</b>	<b>Date Due @ 11:55 PM</b>
HW01	1/18/17	1/25 or 1/27	1/29/17
HW02	1/23/17	1/25 or 1/27	1/29/17
HW03	1/30/17	2/1 or 2/3	2/5/17
HW04	2/6/17	2/8 or 2/10	2/12/17
HW05	2/13/17	2/15 or 2/17	2/19/17
HW06	2/20/17	2/22 or 2/24	2/26/17
HW07	2/27/17	3/1 or 3/3	3/5/17
HW08	3/6/17	3/8 or 3/10	3/12/17
HW09	3/20/17	3/22 or 3/24	3/26/17
HW10	3/27/17	3/29 or 3/31	4/2/17
HW11	4/3/17	4/5 or 4/7	4/9/17
HW12	4/10/17	4/19 or 4/21	4/16/17
HW13	4/17/17	4/26 or 4/28	4/23/17
HW14	4/24/17	5/1	5/3/17