

**PHYS 221-01 & L01 or L02:**  
**Lectures 8:35 am–9:50 am (Mon/Wed), PS 129**  
**General Physics II: Electricity and Magnetism**  
**Spring 2024 Syllabus**

**Instructor:** Dr. Nadia Leyarovska

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**Office Hours: Mon:** 11:30am – 3:30pm, **Wed:** 11:30am – 3:30pm

**TA:** Daniel Molenaar , **e-mail :** [dmolenaar@hawk.iit.edu](mailto:dmolenaar@hawk.iit.edu) , Mailbox in PS 178

**Office Hours: Tues:** 11:30am - 12:30pm, **Thurs:** 11:30am - 12:30pm, **TA office:** Room 091 (downstairs).

**Recitation:** L01: Tuesday 08:35am–9:50am, PS-213;  
L02: Thursday, 08:35am–9:50am, PS-213

**Laboratory:** L01: Tuesday: 10:00am–11:15am, PS-265A  
L02: Thursday, 10:00am–11:15am, PS-265A

**Objectives:** by the completion of this course, students will be expected to be able to

1. Analyze electric charges, fields and forces that are represented & used in several basic configurations or distributions. Students are expected to apply vectors in two & three dimensions.
2. Simplify calculations of various electric and magnetic characteristics by taking advantage of special symmetries in conjunction with laws including Gauss', Ampere's and Biot-Savart's.
3. Describe how we store or transfer electrical & magnetic energy in various types of materials and how that energy is used to move charges or perform external work in devices like generators and motors.
4. Analyze how circuit components like resistors, capacitors & inductors can be modified or combined to affect electrical and magnetic fields & energies and how these values change over time and location.
5. Mathematically represent traveling electromagnetic waves and how they change over space and time.
6. Apply integrals, derivatives & trigonometry to represent & evaluate what happens in real applications.
7. Translate concepts and formulas to real-world applications by developing laboratory methods, conducting experiments, taking and recording accurate measurements, analyzing and synthesizing data and communicating your results effectively to an external audience.

This course will use the *Achieve Macmillan* ( [www.achieve.macmillanlearning.com](http://www.achieve.macmillanlearning.com) ) learning online platform. It uses the FlipItPhysics pre-lecture, quiz & homework system in combination with an e-book from OpenStax ( [www.openstax.org](http://www.openstax.org) ).

**You can join the course by invitation from your instructor or by purchasing your access through a direct link** <https://store.macmillanlearning.com/us/storefront/202310780> .

The first one gives you the option to register for 14 days grace period free of charge.

The second one only allows you to purchase the access outright.

The **Course ID** you will need is: 22v8ff

The title of the course is : **Phys 221 -1 E&M Leyarovska (MW 8:35AM: Spring 2024)**

**Textbook:** OpenStax University Physics , Volume 1-3 by William Moebs, Samuel J. Ling, Jeff Sanny  
E-book version available free of charge for the duration of the class as part of the *Achieve* pre-lecture, quiz & homework system.

A free PDF version of all three volumes can be downloaded from  
<https://openstax.org/details/books/university-physics-volume-2>.

**(Optional):** FlipItPhysics Electricity and Magnetism, (ISBN-13: 978-1-4292-7239-1 or ISBN-10: 1-4292-7239-2) by Gary Gladding, Mats Selen, Tim Stelzer

This is the book version of the interactive prelectures, checkpoints and home works of the course

**Prelectures and Checkpoints:** Prelectures and checkpoints are assigned via the online *Achieve* system before every lecture and are due at 7:00 AM the day of the lecture. There is one day extension with 10% penalty. Two lowest scores will be dropped.

**Homework:** Homework will be assigned via the online *Achieve* system after every lecture. Both Monday and Wednesday assignments are due on MONDAYS at 11:59 PM the next week. There is one day extension with 10% penalty. Two lowest scores will be dropped.

**Quizzes:** Quizzes will be administered during recitations. They will be based primarily on homework or problems covered that day by your TA. There are **NO MAKE-UPS**, but your two lowest scores will be dropped.

**Laboratory:** Laboratory will meet WEEKLY. The manuals are available at <https://www.iit.edu/physics/student-resources>. Some weeks your report will be a worksheet; other weeks your report will be a formal write-up. Which labs require which type of report will be made clear to you by your TA. There are NO MAKE-UPS, but your two lowest lab scores will be dropped. Labs not done incur a zero and turning in a report late incurs a penalty (See the Lab Policy document). **Please note:** This class does not have final for the lab sessions. Your 12 Lab reports are essentially your final spaced over the duration of the course. The completion of at least 8 Lab Sessions (lab and submitted lab reports) are required to receive a passing grade in this course.

**Exams:** There will be two midterms & a final (see schedule on next page). These will be closed book and closed note. A calculator is the **ONLY ALLOWED ELECTRONIC DEVICE**. No smartphones please. A formula sheet will be provided. **NO MAKE-UPS** except in cases where an official University excuse has been granted by the Dean's office.

**Academic Honesty Policy:** All students are expected to follow IIT's Academic Honesty policy which is found at: <https://web.iit.edu/student-affairs/handbook/fine-print/code-academic-honesty>. A first violation results in a grade of zero for that assignment, lab, exam or quiz. Subsequent violations result in a failing grade in the course.

**Grading:** The percentage weighting assigned to each component of this class is given below as is the overall grading scale for the class.

		<b>Max % Grade Min %</b>		
Prelectures & Checkpoints	10%			
Homework	15%	100	A	90
Quizzes	8%	89	B	70
Lab	16%	69	C	60
First Midterm	16%	59	D	50
Second Midterm	16%	49	F	0
Final	19%			

**Accommodations** will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources as soon as possible. The Center for Disability Resources (CDR) is located in 3F3-1 at 10 W 35th St., telephone 312-567-5744 or email [disabilities@iit.edu](mailto:disabilities@iit.edu).

# PHYS 221-01 & L01 or L02 : Spring 2024 Schedule

Week	Lab / Recitation	Date	Prelectures & Checkpoints	Homework Due
1	<b>Assessment Quiz (REC)</b>	Jan 8 Jan 10	Introduction, Coulombs Law Electric Fields	
2	<b>REC (no Lab)</b>	Jan 15 Jan 17	<b>Martin Luther King Day.</b> Electric flux and field lines	Coulombs Law Electric Fields
3	<b>REC. &amp; LAB 1</b>	Jan 22 Jan 24	Gauss Law Electric Potential Energy	Electric flux and field lines
4	<b>REC. &amp; LAB 2</b>	Jan 29 Jan 31	Electric Potential Conductors and Capacitance	Gauss Law Electric Potential Energy
5	<b>REC. &amp; LAB 3</b>	Feb 2 Feb 7	Capacitors Review For EXAM 1	Electric Potential Conductors Capacitors
6	<b>REC. &amp; LAB 4</b>	Feb 12 Feb 14	<b>EXAM 1</b> Electric Current	
7	<b>REC. &amp; LAB 5</b>	Feb 19 Feb 21	Kirchhoff's Rules RC Circuits	Electric Current
8	<b>REC. &amp; LAB 6</b>	Feb 26 Feb 28	Magnetism Forces and Torques on Currents	Kirchhoff's Rules RC Circuits
9	<b>REC. &amp; LAB 7</b>	Mar 4 Mar 6	Bio –Savart Law Ampere's Law	Magnetism Forces/Torques
10		Mar 11 Mar 16	<b>Spring Break</b>	
11	<b>REC. &amp; LAB 8</b>	Mar 18 Mar 20	Motional EMF Faraday Law	Bio –Savart Ampere's Law
12	<b>REC. &amp; LAB 9</b>	Mar 25 Mar 27	Review for EXAM 2 <b>EXAM 2</b>	Motional emf Faraday Law
13	<b>REC. &amp; LAB 10</b>	Apr 1 Apr 3	Induction and RL Circuits LC Circuits and RLC Circuits	
14	<b>REC. &amp; LAB 11</b>	Apr 8 Apr 10	AC Circuits AC Circuits: Resonance and power	Induction and RL Circuits LC and RLC Circuits
15	<b>REC. &amp; LAB 12</b>	Apr 15 Apr 17	Displacement Current and E&M waves Properties of E&M Waves	AC Circuits Resonance and power
16	<b>REC ( no LAB )</b>	Apr 22 Apr 24	Polarization Review for FINAL EXAM	Displacement Current Properties of E&M Waves Polarization
17		Apr 29	<b>FINAL EXAM WEEK</b>	





