

# Physics 250 – University Physics II (Calculus-based)

## Syllabus

## Spring 2023

### COURSE INFORMATION

Course Name:	Physics 250 – University Physics II (calculus-based; 5 credits)
Course Schedule:	Lectures: Monday, Wednesday, & Friday from 1:00 – 1:50 p.m. Discussion: Tuesdays from 1:00 – 1:50 p.m. Laboratory: Asynchronous, on-line labs
Prerequisites:	Both PHYS 240 and MATH 121 (Calculus II) or consent of instructor.
Required text:	University Physics II, 2021 edition by OpenStax ( <a href="https://openstax.org/details/books/university-physics-volume-2">https://openstax.org/details/books/university-physics-volume-2</a> ) and University Physics III, 2021 edition by OpenStax ( <a href="https://openstax.org/details/books/university-physics-volume-3">https://openstax.org/details/books/university-physics-volume-3</a> )
Required Materials:	scientific or graphing calculator, ruler, compass, protractor

This course will provide a general overview of electricity, magnetism, optics, and topics in modern physics. This course is intended for students majoring in the physical sciences or engineering. This class is not recommended for students majoring in business, elementary education, medical technology, and pharmacy. General Education Designations: GDR: NS; GEP: NSC

### INSTRUCTOR INFORMATION

Name:	Dr. Aaron Steffen
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Office Hours:	Monday through Wednesday; 2:00 – 2:50 p.m. (or by appointment)

Aaron's Brief Biography: I am a native of Sheboygan, Wisconsin. I received a B.S. degree in Physics and Mathematics from UW-Eau Claire and my M.S. and Ph.D. in Astronomy from UW-Madison. Before moving into teaching I worked as a postdoctoral research scientist at both Penn State and NASA's Spitzer Science Center (located on Caltech's campus). I am interested in understanding the multi-wavelength properties and evolution of super-massive black holes in the centers of galaxies.

## COURSE STRUCTURE

**Lecture** - I presume that everyone will attend or promptly watch all of the lectures and participate in the labs. Students are responsible for any materials (notes, handouts, etc...) they may have missed due to an absence. A tentative schedule is listed below.

Date	Chapter/Sections	Date	Chapter/Sections	Date	Chapter/Sections
1/23	Intro & 5.1 – 5.2	2/27	12.5 – 12.7	4/10	4.1 – 4.2
1/24	5.3 – 5.5	2/28	13.1 – 13.2	4/11	4.3 – 4.4
1/25	5.6 – 5.7	3/1	13.3 – 13.5	4/12	4.5 – 4.7
1/27	6.1 – 6.2	3/3	13.6 – 13.7	4/14	5.1 – 5.3
1/30	6.3 – 6.4	3/6	14.1 – 14.2	4/17	5.4 – 5.5
1/31	7.1 – 7.2	3/7	14.3 – 14.4	4/18	5.6 – 5.7
2/1	7.3 – 7.5	3/8	14.5 – 14.6	4/19	5.8 – 5.9
2/3	8.1 – 8.2	3/10	15.1 – 15.3	4/21	6.1 – 6.2
2/6	8.3 – 8.5	3/13	15.4 – 15.6	4/24	6.3 – 6.4
2/7	9.1 – 9.2	3/14	16.1 – 16.3	4/25	6.5 – 6.6
2/8	9.3 – 9.4	3/15	16.4 – 16.5	4/26	7.1 – 7.2
2/10	9.5 – 9.6	3/17	1.1 – 1.3	4/28	7.3 – 7.4
2/13	10.1 – 10.2	3/27	1.4 – 1.5	5/1	7.5 – 7.6
2/14	10.3 – 10.4	3/28	1.6 – 1.7	5/2	8.1 – 8.2
2/15	10.5 – 10.6	3/29	2.1 – 2.2	5/3	8.3 – 8.4
2/17	11.1 – 11.3	3/31	2.3 – 2.4	5/5	8.5 – 8.6
2/20	11.4 – 11.5	4/3	2.5 – 2.6	5/8	10.1 – 10.2
2/21	11.6 – 11.7	4/4	2.7 – 2.8	5/9	10.3 – 10.4
2/22	12.1 – 12.2	4/5	3.1 – 3.2	5/10	10.5 – 10.7
2/24	12.3 – 12.4	4/7	3.3 – 3.5	5/12	<b>Final Review</b>

**Labs** - Laboratory activities are designed to give students a hands-on experience with the concepts being covered in lecture. The experiments are designed to be completed during each lab session.

Week of	Lab #	Laboratory Experiment
Jan 23 – 27	0	Setting up Pivot Online
Jan 30 – Feb 3	1	Forces and Electric Charge I
Feb 6 – 10	2	Forces and Electric Charge II
Feb 13 – 17	3	Electric Field
Feb 20 – 24	4	Ohm's Law Simulation
Feb 27 – Mar 3	5	RC Circuits
Mar 6 – 10	6	RL Circuits
Mar 13 – 17	7	Joly Photometer: Brightness vs Distance
Mar 20 – 24		<i>Spring Break</i>
Mar 27 – Mar 31	8	Angle of Refraction
Apr 3 – 7	9	Convex and Concave Curved Mirrors
Apr 10 – 14	10	Light Diffraction
Apr 17 – 21	11	Gas Emission Spectra
Apr 24 – 28	12	Photoelectric Effect with Lasers
May 1 – 5	13	Radioactive Decay and Half-Life
May 8 – 12	...	Lab Make Up Week

**Grading** - Your final grade will be based on the following grading scheme:

- Homework Quizzes – 15%
- Laboratory Experiments – 15%
- Midterm Exams (3) – 15% each
- Comprehensive Final Exam – 25%

The grading scale is as follows:

$93\% \leq A$	$80\% \leq B- < 83\%$	$67\% \leq D+ < 60\%$
$90\% \leq A- < 93\%$	$77\% \leq C+ < 80\%$	$60\% \leq D < 67\%$
$87\% \leq B+ < 90\%$	$73\% \leq C < 77\%$	F < 60%
$83\% \leq B < 87\%$	$70\% \leq C- < 73\%$	

**Homework** - Homework problems will be distributed at the beginning of the semester. Approximately 18-20 homework problems will be assigned each week. To encourage you to do your homework, a weekly homework quiz will be given during the day of the scheduled discussion section.

**Exams** - There will be three mid-term exams in addition to a comprehensive final exam. The mid-term exams are online, 1 hour tests. You will be allowed to use your textbook, your personal notes, conversion/constants sheet provided by instructor, and a scientific calculator.

**Final Exam** - The final exam is scheduled for May 15th. This will be a comprehensive final exam.

## CLASSROOM CONDUCT

To make the classroom environment more conducive to learning the following list of rules will be enforced in all lectures and labs.

**Talking** - Questions for the instructor are always encouraged. In lecture, asking a neighbor a quick question to clarify a point made in class is acceptable, conversations unrelated to the course material are not. In lab (and in some peer activities in lecture) discussions are encouraged, but please try to stay on-topic as a courtesy to your lab partners and neighbors.

## MISCELLANEOUS ITEMS

**Additional Resources** - There are additional resources available outside of the classroom that everyone can access if they desire additional help.

- Please feel free to stop in my office with any questions you may have.
- If you believe that your textbook isn't clear on a certain topic, try reading how that topic is presented in a textbook written by another author. Alternative textbooks are available in the physics study area (Room 384).
- Physics and Math tutoring is available online through the main campus.

**Academic Misconduct** - It is each student's responsibility to know the University of Wisconsin System's policy on Academic Misconduct. Any cheating will invoke disciplinary action. You can download and review the policy from the following website:

[www.legis.state.wi.us/rsb/code/uws/uws014.pdf](http://www.legis.state.wi.us/rsb/code/uws/uws014.pdf)