

Physics 250 – University Physics II (Calculus-based)

Syllabus

Spring 2021

COURSE INFORMATION

Course Name:	Physics 250 – University Physics II (calculus-based; 5 credits)
Course Schedule:	Lectures: Monday, Tuesday, & Thursdays from 2:00 – 2:50 p.m. Discussion: Wednesday from 2:00 – 2:50 p.m. (Wausau) Laboratory: Asynchronous, on-line labs
Prerequisites:	Both PHYS 240 and MATH 121 (Calculus II) or consent of instructor.
Required text:	University Physics II, 2018 edition by OpenStax (https://openstax.org/details/books/university-physics-volume-2) and University Physics III, 2018 edition by OpenStax (https://openstax.org/details/books/university-physics-volume-3)
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 Thursday; 1:00 –1:50 p.m. (or by appointment)
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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 all of the lectures and labs. Students are responsible for any materials (notes, handouts, etc...) they may have missed due to an absence. A tentative schedule is listed below.

Week of	Chapter(s)
Jan 25 – 29	Vol. 2 - Chapter 5: Electric Charges and Fields
Feb 1 – 5	Vol. 2 - Chapter 6: Gauss's Law
Feb 8 – 12	Vol. 2 - Chapter 7: Electric Potential
Feb 15 – 19	Vol. 2 - Chapter 8: Capacitance
Feb 22 – 26	Vol. 2 - Chapter 9: Current and Resistance
Mar 1 – 5	Vol. 2 - Chapter 10: Direct-Current Circuits
Mar 8 – 12	Vol. 2 - Chapter 11: Magnetic Forces and Fields
Mar 15 – 19	Vol. 2 - Chapter 12: Sources of Magnetic Fields
Mar 22 – 26	<i>Spring Break</i>
Mar 29 – Apr 2	Vol. 2 - Chapter 13: Electromagnetic Induction
Apr 5 – Apr 9	Vol. 2 - Chapter 14: Inductance
Apr 12 – 16	Vol. 2 - Chapter 15: Alternating Current Circuits
Apr 19 – 23	Vol. 2 - Chapter 16: Electromagnetic Waves
Apr 26 – 30	Vol. 3 - Chapter 1: The Nature of Light
May 3 – May 7	Vol. 3 - Chapter 2: Geometric Optics and Image Formation
May 10 – 14	Vol. 3 - Chapters 3 & 4: Interference and Diffraction
May 18	Final Exam

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 25 – 29	0	Setting up Pivot Online
Feb 1 – 5	1	Forces and Electric Charge I
Feb 8 – 12	2	Forces and Electric Charge II
Feb 15 – 19	3	Electric Field
Feb 22 – 26	4	Resistivity of Graphite
Mar 1 – 5	5	Ohm's Law Simulation
Mar 8 – 12	6	Kirchhoff's Law
Mar 15 – 19	7	RC Circuits
Mar 22 – 26		<i>Spring Break</i>
Mar 29 – Apr 2	8	Vector Directions in a Current Carrying Wire
Apr 5 – Apr 9	9	Force on a Current Carrying Wire
Apr 12 – 16	10	RL Circuits
Apr 19 – 23	11	Joly Photometer: Brightness vs Distance
Apr 26 – 30	12	Angle of Refraction
May 3 – May 7	13	Convex and Concave Curved Mirrors
May 10 – 14	...	Lab Make Up Week

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

- Classroom Participation – 3%
- Homework Quizzes – 12%
- 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 18th. 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