
PHYSICS 102

Spring 2017
MWF 3:10-4:00
Webster 16

Instructor: Prof. Matthew McCluskey
Office: Webster 646
Phone: 335-5356
E-mail: mattmcc@wsu.edu (the best way to reach me)
Office hours: By appointment (e-mail me to set up a time)

Web site: I will post things on the Blackboard system, <https://learn.wsu.edu/webapps/login/>

Lectures: Lecture slides are available on the web site.
Hard copies of lectures may be purchased at Cougar Copies (recommended).

Text: *College Physics* by OpenStax. The pdf and online versions are free:
<https://openstaxcollege.org/textbooks/college-physics/get>

Homework: Collected through WebAssign, an on-line homework service.

- Go to <https://www.webassign.net/login.html>
- Click on “Enter Class Key”
- Enter the class key: wsu 3221 7551

Homework is due by 3 pm of the following class period:

Problem Set #1 is due by 3 pm Wednesday
Problem Set #2 is due by 3 pm Friday
...etc.

Learning outcomes: Familiarization with physics and ability to solve problems.

How to be successful in this course: (1) Attend lecture. (2) Get hard copies of the lecture slides and write on them during lecture. (3) Do homework problems (using pencil and paper) with a goal toward understanding, not getting a high score. (4) Do the practice problems (provided before each exam).

Devices such as phones must be put away. **Laptops** are not allowed (they distract others), but taking notes on a pad is okay.

Grading:	Laboratory work	20%
	Homework	5%
	Quizzes (best 2 of 3)	5%
	Exams (best 2 of 3)	50%
	Final exam	20%

Letter grades:	90-100	A-/A
	78-89	B-/B/B+
	60-77	C-/C/C+
	<60	D/F

Usually, the median is at the B-/C+ border. There is no “curve,” but I reserve the right to change the letter grade scale. If you believe a grader made a mistake, then put a statement in writing and give it to me. We may deduct points if the grader made a mistake in your favor. Midterm grades are advisory and do not appear on the student’s permanent record, the WSU transcript. For this class, the midterm grade will simply be based your score on the first exam.

Exam seating chart: Everyone will have an assigned seat for the quizzes and exams. It is your responsibility to sit in the correct seat. Let me know if you would like a different seat, or if you will be taking tests at the Access Center.

Exams and quizzes: The exams and quizzes, in class, will start 10 min after the hour. Bring your own pencils, calculators, and brain. No notes, books, accessing the internet, or any other source of information, during any exam. Your lowest exam score and quiz score will be dropped.

- Quizzes are multiple-choice. There are no make-up or early quizzes, even in cases of illness, disability, or emergencies. If you miss a quiz, it will be the one that is dropped.
- On the exams, you must show your work and may receive partial credit. I may offer make-up exams for legitimate excuses, no later than one week after the exam. The make-up exams could be harder than the originals.
- I allow students on an official WSU trip to take a test during their trip. The test must be proctored by an official WSU person. Students must arrange for this well ahead of time.

Exam reviews: I will discuss the solutions to practice problems. You should try to do these practice problems yourself, prior to the review.

Final exam: Comprehensive two-hour exam, in classroom. No early exams. The final exam will be from 3:10 to 5:10 PM, Thursday, May 4, in Webster 16.

Laboratory: Attendance in the laboratory is mandatory. Deficient performance (defined as less than 50%) in the laboratory will result in a failing grade for the entire course. For details on laboratory grading refer to the Physics Lab Syllabus in the lab manual. The Physics 102 laboratories will begin meeting the second week of classes, the week of January 17. Lab manuals will be distributed during the first lab session, but you will need to bring your own lab notebook with carbonless copies. They may be purchased at the Bookie or online. The last regular laboratory exercises will be performed the week of April 17, the week before Closed Week. All laboratory work must be completed and submitted before 5 PM the Monday of Closed Week,

April 24. The lab exam will be administered during Closed Week, during your regular lab session. I am not involved in the lab portion of this course.

Questions about labs or enrollment? Contact Dr. Steve Langford, physlabs@wsu.edu.

Classroom Conduct:

- Disruptions such as lateness, reading newspapers, talking, texting, cell phones ringing, sighing, belching, rolling your eyes, etc., will not be tolerated.
- If I can hear you talking to someone, you're too loud.
- No laptops or other distracting devices.
- Students are responsible for *all* information given in lectures.

Disability Accommodations: Reasonable accommodations are available for students with documented disabilities. If you have a disability and need accommodation to fully participate in the lecture or lab, visit or contact the Access Center (Washington Building 217, Phone: 335-3417, access.center@wsu.edu, accesscenter.wsu.edu) to schedule an appointment with an Access Advisor. All accommodations must be approved through the Access Center. You must notify your instructor and the lab director of approved accommodations during the first week of the course. Accommodations might not be available if requested later.

Academic Integrity: Academic integrity is the cornerstone of higher education. As such, all members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Academic integrity will be strongly enforced in this course. Students who violate WSU's Academic Integrity Policy in Washington Administrative Code (WAC) 504-26-010(3) may lose points on an assignment, fail the assignment, or fail the course, depending on the seriousness of the offense. They may be reported to the Office of Student Conduct, in which case they will not have the option to withdraw from the course pending an appeal.

Cheating includes, but is not limited to, plagiarism and unauthorized collaboration as defined in the Standards of Conduct for Students, WAC 504-26-010(3). You need to read and understand all of the definitions of cheating at

apps.leg.wa.gov/WAC/default.aspx?cite=504-26

If you have any questions about what is and is not allowed in this course, you should ask course instructors before proceeding. If you wish to appeal a faculty member's decision relating to academic integrity, please use the form available at conduct.wsu.edu.

About the instructor: I'm a professor in the Department of Physics and Astronomy and have been at WSU since the Clinton administration. This is my first time teaching Physics 102 (I taught 101 five times). My research interests include semiconductor physics, high-pressure physics, and optics. I authored two textbooks (*Dopants and Defects in Semiconductors*, with Eugene Haller, and *Physics: A Problem Solving Approach*) and one novel (*The Last Weapon*). Hobbies include skiing, running, and cat training.

Campus Safety: Students and staff are expected to be familiar with emergency procedures. General information on campus safety is posted at safetyplan.wsu.edu. Information on how to prepare for specific emergencies can be found at oem.wsu.edu. Weather warnings and safety alerts are posted promptly at alert.wsu.edu. Urgent warnings that apply to the entire University community will also be broadcast using the Campus Outdoor Warning System (speakers mounted on Holland Library and other buildings) and the Crisis Communication System (e-mail, phone, cell phone). It is important to keep your emergency contact information up to date in MyWSU. To enter or update this information, click on the “Update Now!” link in the “Pullman Emergency Information” box on your MyWSU home page, at my.wsu.edu.

An Emergency Guide is posted near each exit of each lecture room. If faced with an emergency, follow the “Alert, Assess, Act,” protocol: Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT to ensure your own safety and the safety of those around you. In case of fire, leave the building using the stairs, if necessary; do not use the elevators. If the emergency involves an active shooter, your options are to RUN, HIDE, or FIGHT (oem.wsu.edu/emergency-procedures/active-shooter). Every door in the lecture and lab rooms can be locked from the inside in case of a lock down. Students with military training may tackle, hogtie, duct tape, and/or sedate the enemy, as needed.

Frequently asked questions:

Q: What is the best way to study for exams?

A: Do lots of problems and understand how to solve them on your own. Review problems sets, do problems in the text, solve problems presented in lectures, and do the exam review problems posted on the physics web site.

Q: Will this be on the test?

A: Well *now* it will be! Seriously, the syllabus tells you which lectures will be covered on the exams. Note that the problem set numbers approximately correspond to the lecture numbers. For example, Problem Set #4 is on material covered in Lecture 4 or before.

Q: Do you grade on a curve?

A: No. But usually, the median grade is at the B-/C+ borderline.

Q: Is the final exam comprehensive?

A: Yes. C’mon, I already told you that on the previous page.

Q: Does 102 mean “easy?”

A: In some departments, yes. In physics, no.

Q: I have a question about labs.

A: I know nothing! Please contact the lab director at physlabs@wsu.edu.

Q: I am having trouble enrolling for this course.

A: I know nothing! Please contact the lab director at physlabs@wsu.edu

Theme	Date	Lecture	Sections*	
Electricity	Jan. 9	1. Coulomb's Law	18.1,18.3	
	11	2. Electric forces in 2D	18.3	
	13	3. Electric field	18.4	
	16	<i>MLK Day – University holiday</i>		
	18	4. Examples of electric field	18.5	
	20	5. Conductors and insulators	18.2,18.7	
	23	6. Electric potential	19.1,19.2	
	25	7. Examples of electric potential	19.3,19.4	
	27	Quiz #1, Fri., covers lectures 1-7		
	30	8. Capacitors	19.5,19.6	
	Feb.	1	9. Current, Ohm's Law	20.1,20.2,21.1
3		10. Power	20.4,20.5	
6		11. Circuits	21.1,21.3,21.6	
8		Review		
10		Exam #1, Fri., covers lectures 1-11		
Magnetism	13	12. Magnetic fields	22.1-22.3,22.9	
	15	13. Forces due to magnetic fields	22.4,22.5,22.7	
	17	14. Applications of magnetism	22.8,22.11	
	20	<i>President's Day – Class holiday</i>		
	22	15. Magnetic flux and induction	23.1-23.3	
	24	16. Generators and transformers	23.5,23.7	
	27	17. Examples of magnetism	23.4	
	Mar. 1	Quiz #2, Wed., covers lectures 12-17		
Light	3	18. Electromagnetic waves	24.1-24.3	
	6	19. Polarization	27.8	
	8	20. Interference and diffraction	27.1-27.5	
	10	21. Circular apertures, resolution	27.6	
	13-17	<i>Spring Break</i>		
	20	Review		
	22	Exam #2, Wed., covers lectures 12-21		
	24	22. Reflection and refraction	25.2,25.3	
	27	23. Prisms, thin film interference	25.5,27.7	
	29	24. Lenses	25.6	
	31	25. Microscopes and telescopes	26.4, 26.5	
	Apr. 3	26. Mirrors	25.7	
	5	Quiz #3, Wed., covers lectures 22-26		
Modern	7	27. Atoms	30.1,30.2	
	10	28. The Bohr model	30.3,30.4	
	12	29. Nuclei	31.3	
	14	30. Nuclear decay	31.4,31.5	
	17	31. Relativity	28.1-28.3,28.6	
	19	Review		
	21	Exam #3, Fri., covers lectures 22-31		
	24	Review (Exam #1 material)		
	26	Review (Exam #2 material)		
	28	Review (Exam #3 material)		

* College Physics by OpenStax. See next page.

Relevant OpenStax sections

<p>18 Electric Charge and Electric Field 18.1 Static Electricity and Charge: Conservation of Charge 18.2 Conductors and Insulators 18.3 Coulomb's Law 18.4 Electric Field: Concept of a Field Revisited 18.5 Electric Field Lines: Multiple Charges 18.7 Conductors and Electric Fields in Static Equilibrium</p> <p>19 Electric Potential and Electric Field 19.1 Electric Potential Energy: Potential Difference 19.2 Electric Potential in a Uniform Electric Field 19.3 Electrical Potential Due to a Point Charge 19.4 Equipotential Lines 19.5 Capacitors and Dielectrics 19.6 Capacitors in Series and Parallel</p> <p>20 Electric Current, Resistance, and Ohm's Law 20.1 Current 20.2 Ohm's Law: Resistance and Simple Circuits 20.4 Electric Power and Energy 20.5 Alternating Current versus Direct Current</p> <p>21 Circuits and DC Instruments 21.1 Resistors in Series and Parallel 21.3 Kirchhoff's Rules 21.6 DC Circuits Containing Resistors and Capacitors</p> <p>22 Magnetism 22.1 Magnets 22.2 Ferromagnets and Electromagnets 22.3 Magnetic Fields and Magnetic Field Lines 22.4 Magnetic Field Strength: Force on a Moving Charge in a Magnetic Field 22.5 Force on a Moving Charge in a Magnetic Field: Examples and Applications 22.7 Magnetic Force on a Current-Carrying Conductor 22.8 Torque on a Current Loop: Motors and Meters 22.9 Magnetic Fields Produced by Currents: Ampere's Law 22.11 More Applications of Magnetism</p> <p>23 Electromagnetic Induction, AC Circuits, and Electrical Technologies 23.1 Induced Emf and Magnetic Flux 23.2 Faraday's Law of Induction: Lenz's Law 23.3 Motional Emf 23.4 Eddy Currents and Magnetic Damping 23.5 Electric Generators 23.7 Transformers</p>	<p>24 Electromagnetic Waves 24.1 Maxwell's Equations: Electromagnetic Waves Predicted and Observed 24.2 Production of Electromagnetic Waves 24.3 The Electromagnetic Spectrum</p> <p>25 Geometric Optics 25.2 The Law of Reflection 25.3 The Law of Refraction 25.5 Dispersion: The Rainbow and Prisms 25.6 Image Formation by Lenses 25.7 Image Formation by Mirrors</p> <p>26 Vision and Optical Instruments 26.4 Microscopes 26.5 Telescopes</p> <p>27 Wave Optics 27.1 The Wave Aspect of Light: Interference 27.2 Huygens's Principle: Diffraction 27.3 Young's Double Slit Experiment 27.4 Multiple Slit Diffraction 27.5 Single Slit Diffraction 27.6 Limits of Resolution: The Rayleigh Criterion 27.7 Thin Film Interference 27.8 Polarization</p> <p>28 Special Relativity 28.1 Einstein's Postulates 28.2 Simultaneity And Time Dilation 28.3 Length Contraction 28.6 Relativistic energy</p> <p>30 Atomic Physics 30.1 Discovery of the Atom 30.2 Discovery of the Parts of the Atom: Electrons and Nuclei 30.3 Bohr's Theory of the Hydrogen Atom 30.4 X Rays: Atomic Origins and Applications</p> <p>31 Radioactivity and Nuclear Physics 31.3 Substructure of the Nucleus 31.4 Nuclear Decay and Conservation Laws 31.5 Half-Life and Activity</p>
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