

Wheeling Jesuit University
Department of Physics

PHYS 241

College Physics II

3 credits

Spring 2019

Instructor: Dr. Peter Ehni

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Office hours: may be found on the web (<http://www.wju.edu/facultyschedules.asp>).

Just click on my name to bring up my schedule. You may also make appointments via phone or email. I am very flexible, so just stop by and see if I'm around. If I'm in I can usually make time for you. I will normally be around between 11 and 1.

Catalog Course Description:

An algebra-based introduction to the concepts and methods of physics: Thermodynamics, Electricity and Magnetism, Waves, Sound and Optics. Students need to have good algebra skills and basic Trigonometry.

Text: College Physics by OpenStax College; <http://openstaxcollege.org> This is a free digital textbook. Printed copies can be purchased through the virtual bookstore or Amazon for \$50-60. Homework is posted and graded by ExpertTA and you will need to purchase a code to access that site – more information is listed below under evaluation methods.

Class Time and Place: 8-8:50 M,W,F in D108.

Student Learning Outcomes:

Upon completing college physics I, you should:

0. Be able to solve multi-step physics problems (M)
1. understand the general mathematical description of motion (L)
2. Thermodynamics
 - (a) understand the concept of internal energy and work in a gas (L)
 - (b) know and apply the first law of thermodynamics to gas processes (M)
 - (c) know and apply the three mechanisms by which heat can be exchanged (M)
 - (d) understand the concept of entropy and the second law of thermodynamics (L)
3. Harmonic Motion
 - (a) distinguish the terms 'harmonic' motion and 'simple harmonic' motion (L)
 - (b) know/understand/apply terms such as amplitude, frequency, angular frequency, phase, and period (L)
 - (c) be able to graph and understand plots of harmonic motion (L)
 - (d) solve initial value problems for simple harmonic motion (L)
4. Optics: Understand and be able to use the following concepts;
 - (a) Reflection and refraction applied to mirrors and simple lenses (M)
 - (b) Lens maker's formula (M)
 - (c) Ray tracing (M)
 - (d) Light as a wave: including interference and diffraction (L)
5. understand the general mathematical description of oscillatory motion and waves (M)

6. know and understand the various types of mechanical waves as well as common wave phenomena such as interference, diffraction, the Doppler Effect, and the inverse square law. (L)
7. Electricity and Magnetism (concepts covered)
 - (a) statics, Coulomb's law, superposition, the electric field (M)
 - (b) symmetry (L)
 - (c) conductors and their properties (L)
 - (d) Gauss' law (spherical, cylindrical, and planar symmetries) (L)
 - (e) work, potential energy, potential (M)
 - (f) The magnetic force on moving charges (M)
 - (g) Ampere's law, currents as sources of B fields (M)
 - (h) With regard to dynamics, we will cover the basics of Faraday's law, inductors, and technological applications thereof (L)
 - (i) light as an electromagnetic phenomena (L)

Evaluation Methods:

There will be four equally weighted Tests:

January 30

February 22

March 27

Final: Monday April 29th at 8 am. The Final will cover topics discussed after March 27th. Physics by its very nature is comprehensive and so shall be the final.

Each test counts 20 pts. toward your final grade.

There will be no make-up Tests!!

The only way to learn Physics is to do Physics. Homework will be assigned almost every class using the Expert TA website You must purchase a code and then go to this website <http://goeta.link/USX50WV-47FB00-1R4> to register for my class. Homework will be graded and scored automatically by the website. Homework will be worth 20 pts. towards your final grade.

Reading assignments will be posted on Blackboard. Reading quizzes can be given after each assigned reading. The quiz will be given on Blackboard. The quiz will be available from the time the reading is assigned until 7:55 am on the next class day. The reading quizzes will be worth 10 pts toward you final grade. . We will do a number of in class learning activities called 'Interactive Lecture Demonstrations'. By simply participating to the best of your abilities as witnessed by you turning in a completed prediction sheet at the end of class you will receive full credit. If you choose to not turn in a completed prediction sheet or are absent that day you will receive no credit. Points from these activities will be included in the reading quiz grade.

Student Progress:

All tests will graded and returned to you. Your homework scores are available anytime on ExpertTA.

Out of the 110 pts. offered you must score 93 pts. and above for an A, 90-92 pts. for an A-, 87-89 pts. for a B+, 83-86 pts. for a B, 80-82 pts. for a B-, 77-79 pts. for a C+, 73-76 pts. for a C, 70-72 pts. for a C-, 67-69 pts. for a D+, 60-66 pts. for a D. Below 60 pts. is an F.

Attendance Policy:

The official school policy for attendance will be in effect: 6 cuts total for the semester.

Last Date to Drop the Course:

March 26, 2019

Disability Statement:

Wheeling Jesuit University offers students with documented disabilities individual accommodations on a case-by case basis with confidentiality in compliance with the American with Disabilities Act and Section 504 of the rehabilitation Act of 1973. Ultimately, all students are responsible for their own academic achievement. They must attend classes, complete course assignments, and fulfill all university requirements for their chosen field of study. It is up to students with disabilities to seek out available assistance on campus and to utilize individualized accommodations.

In order to receive accommodations under Section 504 and ADA, students with disabilities must self-identify to the university, provide current (within three years) and comprehensive documentation concerning the nature and extent of the disability, and communicate their needs to the Disability Services Director in Ignatius Hall room G24 call 304-243-4484 before each semester begins.

Academic Integrity Statement:

Students are advised that WJU's Academic Integrity Policy will strictly be enforced in this course (see <https://www.wju.edu/studentlife/pdf/studenthandbook.pdf>). Questions regarding the policy may be directed to the Office of the Academic Vice-President. Cheating, during any event for which grades are assigned, will warrant immediate separation from the course and a grade of F will be recorded for the course. If I see your cell phone anywhere near you during a test, whether it is turned on or not, I must assume you are cheating (see above sentence on cheating).

Cell phones should be turned off during class. If you just can't make it through class without texting then please leave class to get your fix and consider seeing the school counselor for help with your addiction.

Official E-mail:

An official WJU e-mail is established for each registered student, each faculty member, and each staff member. All university communications sent via e-mail will be sent to this WJU e-mail address.

Academic Resource Center:

The Academic Resource Center (ARC) is a totally free academic-support service available to all enrolled Wheeling Jesuit University students and staffed almost exclusively by WJU students recommended for employment by WJU faculty. The ARC is located in Bishop Hodges Library and is open five days a week:

Sundays 6:00-8:00 p.m.

Mondays-Thursdays 1:00-9:00 p.m.

Please visit the ARC's website (readily accessible on the Cardinal homepage under "Quick Links" or as the first listing under "Student Services") to learn about the ARC's services (emphasizing writing, math, and the sciences) and to schedule appointments.

The Academic Resource Center has a physics tutor who can assist you when I am not available. Call the ARC for the tutor's hours.

Title IX Statement:

Wheeling Jesuit University seeks to provide an environment that is free of bias, discrimination, and harassment. If you have been the victim of sexual harassment, misconduct, or assault we encourage you to report this. If you report this to a faculty member, she or he must notify our college's Title IX coordinator about the basic facts of the incident (you may choose whether you or anyone involved is identified by name). For more information about your options at WJU, please go to <http://wju.edu/titleix/>.

Course Outline:

This is an introductory course covering thermodynamics, vectors, forces, work, energy, momentum, conservation laws, electric and magnetic fields and forces, mechanical waves and vibration, and optics. You need to be comfortable with algebra and trigonometry, i.e. pre-calc.

Our goals are to build a conceptual understanding of physics, increase our problem solving skills and develop our critical thinking abilities. We will study, in order, all or parts of chapters 13-23, 25 & 27, 12.