

effective experiences such as a virtual laboratory). Requires at least 3 laboratory experiences during the course.

- How to evaluate sources of information in science and technology.

In addition to the general-education learning outcomes, this course also includes the crosscutting capacity of Critical Thinking.

Course Goals and Objectives: Goals of this course include: applying notions and models learned in the previous Introductory Physics I course to the understanding of new, advanced concepts and principles of physics; applying notions learned in the previous Calculus I course for problem solving; learning to utilize advanced Calculus methods to produce a mathematical representation of and to analyze physical situations; introduce a wide range of applications to fields other than physics; incorporate contemporary physics in the course and utilize this to analyze the ethical and societal implications of its applications.

To achieve these goals:

- Strong emphasis is given to sound physical arguments and conceptual learning, to strengthen the student's logical capacities.
- Emphasis is given to problem-solving methodology: a modeling approach, based on four types of models commonly used by physicists, is introduced for the students to understand they are solving problems that approximate reality. Then they learn how to test the validity of the model. This approach helps the students see the unity in physics, as a large fraction of problems can be solved using a small number of models.
- Quite often problems require the student to relate to concepts covered in previous chapters or in the previous course.
- Some problems require the use of a computer or graphing calculator. Modeling of physical phenomena enables the students to obtain graphical representations of variables and to perform numerical analyses.
- The course includes practical examples that demonstrate the role of Physics in other disciplines, including engineering, chemistry, life sciences and medicine, and applications relating to modern technology.
- The course connects physics principles to examples of
 - Natural phenomena - such as Lightning, Earthquakes and the Northern Lights;
 - Technological advances - such as Magnetic Levitation Vehicles, Magnetic Resonance Imaging, the Electron Microscope, and Optical Fibers;
 - Ethical and Philosophical issues - such as how making measurements at the atomic or subatomic level alters the status of the system, and the origin and fate of the universe;
 - Societal issues - such as the utilization of Nuclear energy.

Textbook: *PHY 1520, PHY 1620: Serway/Jewett, Principles of Physics: A Calculus-Based Text, Hybrid, 5th Edition.*

Bundled with EWA and EWA Start Guide ISBN: 9781305586871

Notice that the Hybrid format of the textbook is cheaper than the hardcover one. It does not include end-of-chapter problems, but these can be found on the e-book.

Register to WebAssign with the following class key: oakland 9448 1352

Equipment: Protractor, metric ruler, scientific calculator.

Homework: Every week, I will assign homework and it will contain problems and questions which will be graded. I will use the online program WebAssign, which will accept and automatically grade the homework. This requires the Access Card. The homework for each chapter can be submitted a maximum of 5 times. For accessing WebAssign: see the next page. Due time: The assignments are usually due at 11:59 pm on the specified date. No email homework is accepted. The homework is worth 30% of the final grade.

Exams: There will be three exams: two midterm exams and a final exam. Each midterm exam is worth 20% of the final grade, the final exam is worth 30% of the final grade. The exams consist of Problems and Conceptual Questions. All exams will be closed-book. You may bring an 8.5" x 11" hand written sheet containing formulas (one page, two sides); the formula sheet must be submitted with the exam. A scientific calculator is needed plus pencil and ruler. Please notice: clear writing and clarity of expression is a very important component of the exams.

Make-up Policy: In order to be fair to the majority of students who take the exams on time, the general policy is: *NO make-up exams* will be given. A score of zero will be entered for missed tests. If you cannot be present for an exam due to an unavoidable emergency, contact me before the exam if possible or as quickly as possible after the exam to see if an exception can be made.

Laboratories: PHY 1520 includes a laboratory experience aimed at introducing the students to the scientific method of investigation of physics phenomena and principles. Detailed information is provided on a syllabus which will be distributed at the labs. Attendance to all lab sessions is mandatory. Location: Rooms HHS 169. Please notice: although the laboratory's grade is separate from the course grade, since the course and the laboratory are co-requisites, a student failing the course will have to re-take the lab even if he/she passed the lab component of the course. No Lab experience is required for PHY 1620 students.

Grading Scale:

Midterm Exam 1 - 20%, Midterm Exam 2 - 20%, Final Exam - 30%, Homework - 30%

Grade	Honor Points	Percentage
A	4.0	96-100
A-	3.7	90-95
B+	3.3	85-89
B	3.0	80-84
B-	2.7	75-79
C+	2.3	70-74
C	2.0	65-69

C-	1.7	60-64
D+	1.3	55-59
D	1.0	50-54
F	0.0	0-49

Attendance: Attendance to all lectures is expected. Poor attendance usually correlates with poor course grade.

Add/Drops:

The University's add/drop policy will be explicitly followed. It is the student's responsibility to be aware of the university deadline dates for dropping courses.

Reasonable Accommodations:

Accessibility and Accommodations: It is the University's goal that learning experiences be as accessible as possible. Students with disabilities who have questions about course accessibility are encouraged to contact the instructor immediately. The Office of Disability and Support Services (DSS) is available to help. The DSS office is located in room 103A North Foundation Hall.

For more information, call 248-370-3266 or visit <https://www.oakland.edu/dss>

Policy on Academic Misconduct:

The University's regulations that relate to academic misconduct will be fully enforced. Any student suspected of cheating and/or plagiarism will be reported to the Dean of Students and, thereafter, to the Academic Conduct Committee for adjudication. Anyone found guilty of academic misconduct in this course may receive a course grade of F, in addition to any penalty assigned by the Academic Conduct Committee. Students found guilty of academic misconduct by the Academic Conduct Committee may face suspension or permanent dismissal. The full policy on academic misconduct can be found in the General Information section of the Undergraduate Catalog.

Excused Absence Policy:

The University excused absence policy applies to participation as an athlete, manager or student trainer in NCAA intercollegiate competitions, or participation as a representative of Oakland University at academic events and artistic performances approved by the Provost or designee.

For the excused absence policy, see:

<https://www.oakland.edu/provost/policies-and-procedures/>

Student Preferred Name/Pronoun Policy:

Course rosters are typically provided to the instructor with the student's legal names. If you do not identify with the name that is listed with the Registrar's office, please notify me. I will gladly honor your request to address you by an alternate name or gender pronoun. For more information on indicating a preferred first name on university records, please visit:

<https://www.oakland.edu/uts/common-good-core-resources/name-services/>

WEB Assign: How to Get Started

Day One: Register

1. Go to <https://webassign.net> and click on LOG-IN.
2. Click on 'I have a Class Key'
3. Enter the Class Key: **oakland 9448 1352** (this allows me to see your homework grades)
4. Enter your chosen Login name and the required information
5. Click on 'Create my Account'

A review screen will appear with your Username, Institution code & Password.
Print and retain a copy of this information.

6. Once you Login, you need to enter the WebAssign Access Code.

- If you purchased a new textbook, the Access Code card is inside the book.
- If you purchased a used book, you may choose to purchase the Access Code online.

Notice: there is a 14 day grace period to use WebAssign. If you have not purchased your textbook yet, during this time you can do your homework without a registering code.

7. Once you have logged in, you will see the Homepage.

- I suggest you click on Guide (upper right corner) and read the Student Guide.
- For Technical Support click on Help or go to

<http://www.webassign.net/info/support/report.html>~

To access the Homework:

1. Go to <http://www.webassign.net/login.html> (I suggest you Bookmark this page)
2. After you Login, click on 'My Assignments'.

Please notice:

- You may save your work without grading by clicking on 'Save Work' at the end of the question.

Next time you access the assignment, your work will still be available.

- Web Assign will not automatically submit your answer if you only 'Save' your work. Make sure you 'Submit' it before the due date and time.

- You may also choose to 'Submit New Answers to Question xx' or 'Submit All New Answers'.

Remember that there is a maximum of 5 submissions for each problem.

Tentative Course Schedule

Day	Date	Lecture Topics	Chapters
Th	9/6	Electric charge, Coulomb's law, Electric field	19.1 – 19.5
T	9/11	Electric field, motion in the Electric field	19.5 – 19.7
Th	9/12	Electric flux, Gauss's law and its applications	19.8 – 19.10
T	9/18	More applications of Gauss's law, Electric potential	19.10, 20.1, 20.2
Th	9/20	Electric potential and Electric field (connections)	20.3 – 20.6
T	9/25	Capacitance, capacitors, combinations	20.7 – 20.10
Th	9/27	Electric current, resistance, Ohm's law, conduction; electric power, parallel and serial connections	21.1 – 21.7
T	10/2	Kirchhoff's rules, RC circuits	21.8 – 21.9
Th	10/4	Review	
T	10/9	Midterm Exam 1: Chapters 19, 20, 21	
Th	10/11	Magnetic field and its action on a charged particle	22.1 – 22.4
T	10/16	Magnetic forces and torques	22.5 – 22.6
Th	10/18	Biot-Savart law, examples	22.7 – 22.8
T	10/23	Ampère's law, examples	22.9 – 22.11
Th	10/25	Faraday's law, motional emf, Lenz's law	23.1 – 23.3
T	10/30	Induction, RL circuits	23.4 – 23.7
Th	11/1	Displacement current, Maxwell's equations	24.1 – 24.2
T	11/6	Electromagnetic waves	24.3 – 24.4
Th	11/8	Light, reflection and refraction; Review	25
T	11/13	Midterm Exam 2: Chapters 22, 23, 24	
Th	11/15	Images formed by mirrors	26
T	11/20	Wave optics	27
Th	11/22	Thanksgiving	
T	11/27	Blackbody radiation and Photoelectric effect	28.1 – 28.2
Th	11/29	Wave packets, Uncertainty principle, wave function	28.5 – 28.9
T	12/4	Models for atomic structure	29
Th	12/6	Models for atomic structure; Final review	29
T	12/11	12:00 – 3:00 p.m. Final Exam, cumulative	

Note:

This schedule is subject to change except for dates of exams.