

Basic Course Information

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| Semester | Spring 2014 | Instructor Name | Dr. Alejandro Cozzani |
| Course Title & # | Physics 204 | Email | alex.cozzani@imperial.edu |
| CRN # | 20175 | Webpage (optional) | Refer to Blackboard |
| Room | 2731 | Office | 2767 |
| Class Dates | January 21 to May 16, 2014 Drop date: April 12, 2014 | Office Hours | Mondays through Thursday 7:00 to 7:30 AM. Mondays and Wednesdays 11:15 to 11:45 AM. Tuesdays and Thursdays 9:40-10:10 AM. |
| Class Days | Tuesday and Thursday | Office Phone # | 760-355-5720 |
| Class Times | Lecture: Tuesday and Thursday 12:55 PM to 3:00 PM. | Office contact if student will be out or emergency | Silvia Murray 760-355-6201 or Ofelia Duarte 760-355-6155 |
| Units | Lab: Tuesday and Thursday 3:10 PM to 4:35 PM. 5.0 | | |

Course Description

This course is designed to give an understanding of the fundamental principles of physics in the area of optics, thermodynamics, and modern physics.

Student Learning Outcomes

1. Solve problems involving plane mirrors, thin lenses, and spherical mirrors.
2. Solve polarization, reflection, refraction, and diffraction problems.
3. Solve single and double slit interference problems.
4. Solve temperature, heat, and First Law of Thermodynamics problems.
5. Solve problems involving the Kinetic Theory of Gases, entropy, and the Second Law of Thermodynamics.

Course Objectives

1. The student will solve problems involving interference, reflection, and transmission of transverse waves.
2. The student will solve problems involving velocity, frequency, energy, intensity, and the Doppler effect of sound waves.
3. The student will solve problems involving resonance, superposition and interference of standing waves in air, strings, rods and plates.
4. The student will solve problems involving temperature, thermometric properties, and temperature scales.
5. The student will solve problems involving thermal energy, heat capacity, latent heat, heat transfer, and the first law of thermodynamics.
6. The student will solve problems involving the kinetic theory of gases and the concepts of ideal gases.

7. The student will solve problems involving heat engines, refrigeration, entropy, and the second law of thermodynamics.
8. The student will solve problems involving Huygens' Principle, reflection, and refraction.
9. The student will solve problems involving images formed by plane mirrors, spherical mirrors, and thin lenses.
10. The student will solve problems involving interference of light waves, Young's Double Slit Experiment, and interference in thin films.
11. The student will solve problems involving single slit diffraction, resolution, diffraction gratings, and polarization.
12. The student will solve problems involving Einstein's Theory of special relativity.
13. The student will solve problems involving the hypothesis of Planck, Einstein's photoelectric effect, atomic spectra, and the Bohr Theory of the atom.
14. The student will solve problems involving the wave properties of particles, the uncertainty principle, and the Schrodinger wave equation.
15. The student will solve problems involving the hydrogen atom, quantum numbers, electron spin, and the exclusion principle.

Textbooks & Other Resources or Links

1. **Textbook:** Fundamental of Physics, 9th edition, ISBN: 978-0-470-46908-8.
2. **Author:** Halliday, Resnick, and Walker.

Course Requirements and Instructional Methods

1. **Homework:** The purpose of homework is to provide the student with sufficient practice to master all topics studied in class and to do well on tests. Each homework assignment is due a week after we complete each chapter. For example, if we finish chapter # 1 on February 20th, homework # 1 is due on February 27th. From each chapter you are required to answer any 10 problems not previously solved in class. When turning in homework assignments please include the following information: Your Name, Class Code, Homework #, Page #, and Problem #. Failure to do so may result in inaccurate grade recording.
2. **Lab Reports:** These reports must be typed, double-space, font Times New Roman or similar, size 12, and the graphs must be done with Excel or any graphing program (i.e. TI InterActive). Reports are due a week after the specific experiment has been performed (If the experiment was done on September 03, it is due on September 10). No corrections will be allowed.
3. **Reading Questions:** They are available in the webpage in PowerPoint format. You will read the questions and you will answer them as you read the textbook. Since they are multiple-choice, you will pick the best answer to each statement according to your interpretation along with a brief justification. Correct answers are provided to check your understanding. If your answers do not agree, go back and see if you are able to figure out why that given answer is the right one instead of the one you have chosen. They are due along with HW assignments.
4. **Lecture Notes:** On lecture days, students are expected to have read the chapter in advance and bring some written notes to class (typed or handwritten). There is no specific format (bullets, paragraphs, etc.) and they will be turned in for a grade. It needs to be at least one page long, excluding formulas.
5. **Tests or Exams:** They may be T/F, multiple choice or combination of T/F and/or multiple choice and free response questions. No makeup exams!

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6. **Lab Tests:** Students will be tested on laboratory experiments. These will be based on the data collected and the analysis questions on the experiments. You may be asked the exact same questions or similar to those found on the lab manual and some theoretical questions related to those labs.
7. The laboratory environment contains a variety of chemical and physical hazards. It is vital to understand those potential hazards and their safeguards in order to prevent accidents and injuries. In order to work in a laboratory in the Department of Physics at Imperial Valley College, the student must understand and agree to abide by the laboratory safety rules set forth. Please refer to the following web page: <http://forms.imperial.edu/machform/view.php?id=24> and after reading the guidelines, fill out the web-based form. Use the same name as in Webstar or the system may not recognize you. Failure to comply will result in labs no participation with the corresponding zeros in experiments until the student fills out the form.
8. **Mid-term and Final Exam:** They may include questions from the tests (recycled questions) and new questions (you have not seen them before but with similar difficulty). No makeup exams!
9. **Special Project:** Please see below.

Rubric

| Criterion | High (5) | Medium (3) | Medium-Low (2) | Low (1) | Student Evaluation | Instructor Evaluation |
|---|---|---|--|--|---------------------------|------------------------------|
| Content/ information | <i>accurate and concise; all relevant information is presented completely; clearly describes all principles involved; gives accurate history of application or theory</i> | <i>information is accurate; relevant information is present with some details missing; states all principles involved & describes most; gives brief history</i> | <i>information has some errors; most of the relevant information is present; states some of the principles covered; no history</i> | <i>major errors in information presented; not all relevant information presented; names a few or none of the principles involved; no history</i> | | |
| Presentation | <i>makes eye contact; speaks knowledgeably without referring to notes; involves fellow students; clear well modulated voice</i> | <i>some eye contact; little need to reference notes; some involvement with fellow students; varies voice at times</i> | <i>no eye contact; uses notes frequently; very little involvement with fellow students; rarely varies voice</i> | <i>avoids looking at audience; reads notes; no involvement with fellow students; speaks in a monotone</i> | | |
| Visual Aids (models, diagrams, etc.) | <i>aid used in the presentation is neat and organized; provides excellent support to the presentation making the words more easily understood</i> | <i>aid is used but as such is messy (globs of glue, dirty/cramped, dirty, pieces of tapes, etc.); provides good support for the presentation</i> | <i>visual aid is messy and poorly organized; adds little support to the presentation</i> | <i>no visual aids used</i> | | |
| Creativity | <i>keeps other students interested throughout</i> | <i>some students appear distracted at times during the presentation</i> | <i>fails to capture and maintain interest of all students</i> | <i>fails to capture student interest at any time</i> | | |
| Organization | <i>presentation follows a logical pattern; smooth transitions between sections</i> | <i>presentation follows a logical pattern; only a few rough points</i> | <i>presentation not given in a logical sequence but some organization present; transitions are abrupt</i> | <i>presentation lacks organization; speaker appears to move randomly from one idea to the next</i> | | |

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| Understanding of the Topic | <i>presenter conveys an outstanding understanding of the material</i> | <i>presenter conveys a good understanding of the material</i> | <i>presenter lacks a complete understanding of the material</i> | <i>presenter has a poor understanding of the material</i> | | |
|-----------------------------------|---|---|---|---|--|--|

Oral presentation: maximum 30 points

- a. Follow Rubric for point distribution.

Topics: Any chapters not addressed in class, chapter 37 and up.

Review questions: 10 points

- b. Between 5 and 10.
- c. They should reflect what you have taught to your classmates. You may use the ones available in BB but make sure you know the answers and the reason for those answers.

Review problems: 10 points (about five with increasing level of difficulty).

- d. You have to be able to explain them to your classmates so they will understand.

Presentation dates: according to sign-up list. Once dates have been established, you cannot change it because presentations have a sequential order. You may pick the topic and your team members (no more than 3 per group) or you may work individually if you prefer to do so.

Minimum time is 30 minutes and up to an hour long.

- If you are absent the day of your presentation, your grade is ZERO (no exceptions!) so plan ahead.
- Use your own computer.

Course Grading Based on Course Objectives

The student's grade will depend on the following areas (not on total points):

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| Homework/Lecture Notes/Reading Questions | 20% |
| Tests – Presentation | 20% |
| Lab Reports - Lab Tests | 20% |
| Mid-term | 20% |
| Final Exam | 20% |
| TOTAL | 100% |

All grades are calculated by using the standard scale of:

A = 100-90% **B = 89-80%** **C = 79-70%** D = 69-60% F = 59% and below

Attendance

- A student who fails to attend the first meeting of a class or does not complete the first mandatory activity of an online class will be dropped by the instructor as of the first official meeting of that class. Should

readmission be desired, the student's status will be the same as that of any other student who desires to add a class. It is the student's responsibility to drop or officially withdraw from the class. See General Catalog for details.

- Regular attendance in all classes is expected of all students. A student whose continuous, unexcused absences exceed the number of hours the class is scheduled to meet per week may be dropped. For online courses, students who fail to complete required activities for two consecutive weeks may be considered to have excessive absences and may be dropped.
- Absences attributed to the representation of the college at officially approved events (conferences, contests, and field trips) will be counted as 'excused' absences.
- 3 Tardies = 1 Absence (Arriving within the first 20 minutes after the beginning of the class or leaving within the last 20 minutes before the end of the class).

Classroom Etiquette

- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class unless otherwise directed by the instructor.
- Food and Drink: are prohibited in all classrooms. Water bottles with lids/caps are the only exception. Additional restrictions will apply in labs. Please comply as directed.
- Disruptive Students: Students who disrupt or interfere with a class may be sent out of the room and told to meet with the Campus Disciplinary Officer before returning to continue with coursework. Disciplinary procedures will be followed as outlined in the General Catalog.
- Children in the classroom: Due to college rules and state laws, no one who is not enrolled in the class may attend, including children.

Academic Honesty

- Plagiarism is to take and present as one's own the writings or ideas of others, without citing the source. You should understand the concept of plagiarism and keep it in mind when taking exams and preparing written materials. If you do not understand how to correctly 'cite a source', you must ask for help.
- Cheating is defined as fraud, deceit, or dishonesty in an academic assignment or using or attempting to use materials, or assisting others in using materials, or assisting others in using materials, which are prohibited or inappropriate in the context of the academic assignment in question.

Anyone caught cheating or will receive a zero (0) on the exam or assignment, and the instructor may report the incident to the Campus Disciplinary Officer, who may place related documentation in a file. Repeated acts of cheating may result in an F in the course and/or disciplinary action. Please refer to the General School Catalog for more information on academic dishonesty or other misconduct. Acts of cheating include, but are not limited to the following: (a) plagiarism; (b) copying or attempting to copy from others during an examination or on an assignment ;(c) communicating test information with another person during an examination; (d) allowing others to do an assignment or portion of an assignment, (e) use of a commercial term paper service.

Additional Help

- Blackboard support center: <http://bbcrm.edusupportcenter.com/ics/support/default.asp?deptID=8543>
- Learning Labs: There are several 'labs' on campus to assist you through the use of computers, tutors, or a combination. Please consult your college map for the Math Lab, Reading & Writing Lab, and Learning Services (library). Please speak to the instructor about labs unique to your specific program

- Library Services: There is more to our library than just books. You have access to tutors in the learning center, study rooms for small groups, and online access to a wealth of resources.

Disabled Student Programs and Services (DSPS)

Any student with a documented disability who may need educational accommodations should notify the instructor or the Disabled Student Programs and Services (DSP&S) office as soon as possible. The DSP&S office is located in Building 2100, telephone 760-355-6313 if you feel you need to be evaluated for educational accommodations.

Student Counseling and Health Services

Students have counseling and health services available, provided by the pre-paid Student Health Fee. We now also have a fulltime mental health counselor. For information see <http://www.imperial.edu/students/student-health-center/>. The IVC Student Health Center is located in the Health Science building in Room 2109, telephone 760-355-6310.

Student Rights and Responsibilities

Students have the right to experience a positive learning environment and due process. For further information regarding student rights and responsibilities please refer to the IVC General Catalog available online at

http://www.imperial.edu/index.php?option=com_docman&task=doc_download&gid=4516&Itemid=762

Information Literacy

Imperial Valley College is dedicated to help students skillfully discover, evaluate, and use information from all sources. Students can access tutorials at <http://www.imperial.edu/courses-and-programs/divisions/arts-and-letters/library-department/info-lit-tutorials/>

Anticipated Class Schedule / Calendar

| WEEK # START DAY | CORE CONTENT | READING DUE | ASSIGNMENT DUE |
|---------------------|--|--------------------------|----------------|
| 1-January 20 | Day 1: Syllabus / Introduction Day 2: Waves-I | Chapter 16 | Read Chapter |
| 2-January 27 | Day 1: Waves-I Day 2: Waves-II | Chapter 16 Chapter 17 | Read Chapter |
| 3-February 03 | Day 1: Waves-II Day 2: Waves-II | Chapter 17 | |
| 4-February 10 | Day 1: Electromagnetic Waves Day 2: Electromagnetic Waves | Chapter 33 | Read Chapter |

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| 5- February 17 | Day 1: Review Day 2: Test | | Test # 1 (Chapters 16- 17-33) |
| 6- February 24 | Day 1:Images Day 2:Images | Chapter 34 | Read Chapter |
| 7- March 03 | Day 1: Interference Day 2: Interference | Chapter 35 | Read Chapter |
| 8-March 10 | Day 1: Diffraction Day 2: Diffraction | Chapter 36 | Read Chapter |
| 9-March 17 | Day 1: Temperature, Heat, and the First Law of Thermodynamics Day 2: Temperature, Heat, and the First Law of Thermodynamics | Chapter 18 | Read Chapter |
| 10-March 24 | Day 1: Review for Mid-term Day 2: Mid-term | | Mid-term (Chapters 16-17-33-34-35-36) |
| 11-March 31 | Day 1: The Kinetic Theory of Gases Day 2: The Kinetic Theory of Gases | Chapter 19 | Read Chapter |
| 12-April 07 | Day 1: Entropy and the Second Law of Thermodynamics Day 2: Entropy and the Second Law of Thermodynamics | Chapter 20 | Read Chapter |
| 13-April 14 | Day 1: Relativity Day 2: Test | Chapter 37 | Read Chapter Test # 2 (Chapters 18-19-20) |
| April 21 | SPRING BREAK | | |
| 14-April 28 | Day 1: Photons and Matter Waves Day 2: More about Matter Waves | Chapter 38 Chapter 39 | Read Chapter Read Chapter |
| 15-May 05 | Day 1: More about Matter Waves Day 2: | Chapter 40 | Read Chapter |

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| | Review for Final Exam | | |
| 16-May 12 | Day 1: Final Exam Day 2: Review final exam and answer questions | | <i>Final Exam</i> (Chapters 18-19-20-37-38-39-40) |