Designed for non-science majors, this course deals with phenomena in nature described in terms of vibrations and waves, including sound and light, and also phenomena related to thermal physics, including temperature, heat, and thermodynamics. Elementary Physics I (PHYS 1405) is not a prerequisite for Elementary Physics II.

Instructor: Dr. George M. Irwin, Associate Professor of Physics  
Phone: 880-8243  Office: Archer 100E, Lab: Geology 212A  
email: gmirwin@lamar.edu  Office Hours MWF 9-10, 11-12  T 10-12

Lecture: MWF 12:20-1:10, Archer 108

Labs: Th 9:30-11:30, 12:30-2:30, 2:30-4:30  Archer 101

Materials needed for course

- Scantron Forms (#882) for exams
- Scientific Calculator for exams and laboratories

Textbook: Conceptual Physics by Paul Hewitt (11th edition)  

Grading System:

A student’s final grade percentage will be calculated with the following weights:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Laboratory</td>
<td>15%</td>
</tr>
<tr>
<td>Exams (4)</td>
<td>60%</td>
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<tr>
<td>Quizzes</td>
<td>10%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>15%</td>
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</table>

Letter grades for the course will be assigned accordingly: >90% A, 80%-90% B, 70%-80% C, 60%-70% D, <60% F

The instructor reserves the right to alter the grading system as long as students’ final grade percentages are improved.
Physics Core Learning Outcomes – After completing this course the student will demonstrate

1) critical thinking skills by applying fundamental physical principles to real world examples,

2) quantitative analysis skills by applying basic mathematical principles to the solution of real world examples,

3) the ability to work with others in a common effort to achieve an outcome through cooperation and teamwork in a laboratory exercise,

4) communication skills by reporting the process and results of a laboratory exercise in a written laboratory report.

Attendance: Attendance is required, and a student may have no more than 4 un-excused absences or they must drop the course or receive a failing grade (F). Under extreme circumstances excused absences may be granted by the instructor, if appropriate documentation is presented.

Exams (4 @ 15% each): Students will be allowed to use a calculator for exams, and may also prepare a single 3 inch by 5 inch note-card to use for reference during the exam. It is recommended that students purchase a simple scientific calculator allowing scientific notation. Cell phones must be turned off and out of sight for exams. A Scantron form #882 will be required for exams. Exams will consist of 50 questions in a multiple choice format. These questions will be based heavily on the reading assignments, homework, and laboratory concepts.

If a student has a compelling reason for missing any of the four scheduled exams, the instructor must be notified and documented evidence must be presented to the instructor as soon as possible. If the instructor finds this acceptable, other arrangements may be allowed. Failure to give earliest possible notification and documentation as soon as possible will result in a grade of zero for the exam.

Quizzes (10%): The instructor will occasionally administer unannounced quizzes over current topics in the course. These quizzes will consist of questions similar to exam questions, and sometimes problems and other formats. In accordance with the mandatory attendance policy outlined above, it is the student’s responsibility to be present for quizzes. Prior notification of quizzes will not be given under any circumstances, and make-up quizzes will not be allowed.

Laboratory (15%): There are 10 scheduled laboratory sessions. In order for a student to pass the course, at least 8 laboratory sessions must be completed. If 10 labs are successfully completed, the student will receive the full 15% for lab. If three labs are missed, the student must drop the course or receive a failing grade (F). Tardiness is disruptive and will not be tolerated, and may result in lost points at the instructor’s discretion. Makeup for individual labs
will generally not be allowed, although excused absences *may* be granted for acceptable medical reasons or other extreme circumstances. A single makeup lab is scheduled near the end of the semester. Other policies will be detailed by the lab instructor.

**Comprehensive Final Exam (15%)**: The Final Exam is comprehensive, covering all four units of the course. As for the midterm exams, a *single* 3 inch by 5 inch note-card may be prepared for reference during the Final Exam. The Final Exam will consist of 50 questions over the material covered in the four units.

**Classroom Disturbances**: Tardiness to class will not be tolerated, and may result in un-excused absences or loss of credit at the instructor’s discretion. Cell phones and pagers must be turned off prior to class. **CELL PHONES MAY NOT BE USED AS CALCULATORS ON EXAMS.** On the other hand, classroom discussion is encouraged within the constraints of the lecture format. Students should feel free to ask questions and to comment about the material covered in class and lab. However, classroom participation is not *required* and will not be a consideration in assigning final course grades. All other classroom disturbances will be limited to the instructor...

**Academic Honesty Policy**: It is expected that students will adhere to the Academic Honesty Policy as detailed in the Student Handbook or face failure and subsequent disciplinary action.

**Students with Disabilities** - Students requiring special accommodations should contact the instructor in the first week of classes. All reasonable effort will be made to ensure that students with disabilities enjoy a full educational experience.

**Important Dates:**

- No Class days: March 12-16, April 6
- Last day to drop with refund: Th. Feb. 3
- Last day to drop or withdraw for semester: M. April 2
- Last Class Day: M. May 9

**FINAL EXAM**    **Friday, May 11, 11:00-1:30 pm**
COURSE SCHEDULE

Students are expected to complete reading assignments in advance of class according to the schedule below. This course schedule should be considered tentative and is subject to change by the instructor. You should pay particular attention to all Review Questions (RQ), and selected Exercises (EX), and Problems (P) specified in the schedule below for each reading assignment. The instructor will choose many of these to discuss in class, and may assign others during lectures. Homework is not collected for credit, but students are responsible for solutions nonetheless. Answers to homework will periodically be posted on “Blackboard”. You should feel free to ask questions about other exercises in the text, or any other relevant topic. Students should also become familiar with the “Summary of Terms” at the end of each chapter, which is cross-referenced with the Glossary at the end of the textbook.

Unit I Vibrations, Waves, and Sound

Jan. 18, 20, 23 Chapter 19 Vibrations and Waves
RQ 1-28
EX 1, 2, 3, 4, 6, 8, 9, 10, 11, 21, 26, 31, 35, 38, 40
P 1, 2, 3, 5, 7

Jan. 25, (27), 30 Chapter 20 Sound
Feb. 1 RQ 1-28
EX 1, 2, 3, 6, 8, 12, 15, 16, 18, 19, 24, 29, 33, 46, 48, 50
P 1, 2, 3, 4, 9, 10

Feb. 3, 6, 8 Chapter 21 Musical Sounds
Feb. 20 RQ 1-17
EX 2, 4, 5, 7, 11, 14, 17, 29, 22, 24, 26, 31, 32, 33, 34, 38, 40, 42
P 1, 3, 4, 5

Monday Feb. 13 Exam I (Chapters 19, 20, 21)
Unit II  Electromagnetic Waves, Light, Color, Ray Optics

Feb. 17, 20, 22  Chapter 26  Properties of Light
                  RQ 1-26
                  EX 1, 2, 4, 5, 9, 11, 16, 17, 18, 20, 22, 32, 33, 43, 46, 47, 48
                  P 1, 3, 4, 5, 8

Feb. 24, 27  Chapter 27  Color
              RQ 1-30
              EX 1, 2, 5, 10, 11, 13, 16, 17, 22, 25, 26, 28, 30, 40, 41, 44

Feb. 29, Mar. 2, 5  Chapter 28  Reflection and Refraction
                    RQ 1-30
                    EX 1, 2, 3, 5, 6, 8, 14, 15, 22, 23, 24, 29, 38, 47, 59
                    P 3, 5, 8

Wednesday Mar. 7  Exam II  (Chapters 26, 27, 28)

Mar. 4

Mar. 12-16  NO CLASS, Spring Break

Unit III  Wave Optics, Light Quanta

Mar. 19, 21, 23  Chapter 29  Light Waves
                  RQ 1-25
                  EX 3, 5, 7, 10, 12, 17, 18, 19, 26, 27, 28, 29, 32, 34, 35, 36, 37, 38,
                  42, 44, 45

Mar. 26, 28, 30  Chapter 30  Light Emission
                  RQ 1-32
                  EX 3, 5, 6, 8, 9, 10, 12, 13, 15, 19, 24, 31, 37, 44, 47, 50
                  P (1)

April 2, 4, 9  Chapter 31  Light Quanta
               RQ 1-27
               EX 1, 3, 4, 5, 6, 8, 10, 13, 17, 28, 31, 35, 36, 37, 44
               P 1, 2

(No class on Friday April 6)

Wednesday April 11  Exam III  (Chapters 29, 30, 31)
Unit IV  Heat and Thermodynamics

Apr. 13, 16  Chapter 15  Temperature, Heat, and Expansion
             RQ 1-30
             EX 2, 6, 7, 8, 14, 16, 28, 29, 37, 41, 42, 45, 50, 51, 52, 59
             P 1, 2, 5, 6, 10

Apr. 18, 20  Chapter 16  Heat Transfer
             RQ 1-33
             EX 1, 6, 18, 22, 24, 25, 27, 28, 32, 37, 46, 48, 55
             P 2, 6

Apr. 23, 25  Chapter 17  Change of Phase
             RQ 1-30
             EX 3, 4, 10, 12, 13, 14, 24, 25, 26, 27, 28, 29, 33, 36, 40, 42, 45,
             46, 48, 54, 55, 58, 60
             P 3

Apr. 27, 30  Chapter 18  Thermodynamics
             RQ 1-28
             EX 2, 5, 7, 12, 19, 23, 25, 26, 27, 28, 38, 44, 45
             P 2, 3, 8

Monday May. 7  Exam IV  (Chapters 15, 16, 17, 18)

May 9  Last Class Day: Review for Final Exam

FINAL EXAM  Friday, May 11  11:00 am-1:30 am
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<th>Date</th>
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<td>Wave Speed</td>
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<td>Standing Waves</td>
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<td>Apr. 19</td>
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<td>Specific Heat</td>
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<td>Apr. 26</td>
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<td>Phase Changes</td>
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<td>May 3</td>
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<td>Michelson Microwave Interferometer (mike up lab)</td>
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<td>May 10</td>
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<td>NO LAB (Final Exams begin)</td>
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