



**HOUSTON COMMUNITY COLLEGE**

**SOUTHWEST COLLEGE**

**COURSE SYLLABUS<sup>1</sup> PHYS 2126 – Laboratory Physics II**

**SUMMER II 2016 Monday, Wednesday & Friday. 5:30 – 8:30 P.M.**

**Class Number CRN# 15189**

<b>Discipline/Program</b>	Physics
<b>Course Level</b>	First Year (Freshman)
<b>Course Title</b>	Laboratory Physics II
<b>Course Rubric and Number</b>	PHYS 2126
<b>Semester with Course Reference Number (CRN)</b>	SUUMER II CRN # 15189
<b>Course Location/Times</b>	Mon, Wed & Fri. 5:30 - 8:30 P.M. West Loop, Rm C221
<b>Course Semester Credit Hours (SCH) (lecture, lab)</b>	1 (3 lab)
<b>Total Course Contact Hours</b>	48
<b>Course Length (number of weeks)</b>	5
<b>Type of Instruction</b>	In-person
<b>Instructor contact information (phone number and email address)</b>	Dr. Ambrose Ononye E-mail: ambrose.ononye@hccs.edu Learning Web: <a href="http://learning.hccs.edu/faculty/ambrose.ononye">http://learning.hccs.edu/faculty/ambrose.ononye</a>
<b>Office Location and Hours</b>	By appointment
<b>Course Description: ACGM</b>	Laboratory experiments supporting theoretical principles presented in PHYS 2326  Co-requisite: PHYS 2326—University Physics II
<b>Course Description: HCC Catalog Description</b>	Selected laboratory experiments related to topics in PHYS 2326 University Physics II) for science and engineering majors.  Core Curriculum Course.
<b>Course Prerequisite(s)</b>	Prerequisite/Corequisite: PHYS 2326; Must be placed into GUST 0341 (or higher) in reading and be placed into MATH 2414 (or higher).

<sup>1</sup> The instructor reserves the right to change or modify the syllabus, as he/she deems necessary, with or without notice.

Academic Discipline Program Learning Outcomes	<p><b>Upon successful completion of the Program, students should be able to:</b></p> <p><b>Program SLO #1:</b></p> <p><b>Demonstrate understanding of the fundamental concepts of physics and/or astronomy.</b></p> <p>Demonstrate understanding of the fundamental principles underlying physics and astronomy including concepts and methods of inquiry at an appropriate level. Topics include, but are not limited to, the Scientific Method, Newtonian Mechanics, Electricity and Magnetism, Thermodynamics, Mechanical and Electromagnetic Waves, Solar Astronomy and Stars and Galaxies.</p> <p><b>Program SLO #2:</b></p> <p><b>Solve conceptual and numerical problems in Physics and/or Astronomy.</b></p> <p>Solve conceptual and numerical problems through the recognition of the type of problem at hand, analysis of relevant information, proper application of concepts and techniques applying mathematical tools at an appropriate level. Students should demonstrate improvement in problem solving skills as they progress through courses in the program.</p> <p><b>Program SLO #3</b></p> <p><b>Demonstrate appropriate laboratory skills</b></p> <p>Demonstrate appropriate laboratory skills including proper use of basic measuring devices, interpretation of laboratory directions and analysis of data obtained using appropriate tools, such as graphical/tabular methods using computers.</p> <p><b>Program SLO #4:</b></p> <p><b>Develop interpersonal communication skills</b></p> <p>Demonstrate an ability to work independently and/or as part of a team through participation in laboratory activities as well as assigned projects.</p>
Course Student Learning Outcomes (SLO)	<p>Upon successful completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Design and perform experiments, collect and analyze data, and interpret results obtained in a laboratory setting.</li> <li>2. Analyze, evaluate, and test a model or scientific hypothesis by comparing with experimental data.</li> <li>3. Use scientific language to demonstrate an understanding of the difference between scientific and non-scientific interpretations of phenomena observed</li> </ol>

<b>Learning Objectives</b> <b>(Numbering system linked to SLO)</b>	<p>Upon successful completion of this course, students should be able to:</p> <p><b>1.1</b> Identify appropriate sources of information for conducting laboratory experiments.  <b>1.2</b> Design and/or conduct basic experiments involving principles of electricity and magnetism.  <b>1.3</b> Demonstrate competency in the use of laboratory instrumentation, including computer tools for data collection.</p> <p><b>2.1</b> Relate physical observations and measurements involving electricity and magnetism to theoretical principles.  <b>2.3</b> Evaluate the accuracy of physical measurements and the potential sources of error in the measurements.</p> <p><b>3.1</b> Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner</p>																												
<b>SCANS and/or Core Curriculum Competencies</b>	Reading, Speaking/Listening, Critical Thinking, Computer/Information Literacy																												
<b>Course Calendar</b>	<p><b><u>PLEASE OBSERVE ALL SAFETY RULES</u></b></p> <table data-bbox="526 877 1302 1696"> <thead> <tr> <th data-bbox="526 877 1166 909"><b><u>EXPERIMENTS</u></b></th> <th data-bbox="1166 877 1302 909"><b><u>EXPER. NO.</u></b></th> </tr> </thead> <tbody> <tr> <td data-bbox="526 936 1166 968">Speed of Sound</td> <td data-bbox="1166 936 1302 968">1</td> </tr> <tr> <td data-bbox="526 995 1166 1026">Specific Heat</td> <td data-bbox="1166 995 1302 1026">2</td> </tr> <tr> <td data-bbox="526 1054 1166 1085">Heat of Fusion</td> <td data-bbox="1166 1054 1302 1085">3</td> </tr> <tr> <td data-bbox="526 1113 1166 1144">Electric Field</td> <td data-bbox="1166 1113 1302 1144">4</td> </tr> <tr> <td data-bbox="526 1171 1166 1203">Ohm's Law</td> <td data-bbox="1166 1171 1302 1203">5</td> </tr> <tr> <td data-bbox="526 1230 1166 1262">Wheatstone Bridge</td> <td data-bbox="1166 1230 1302 1262">6</td> </tr> <tr> <td data-bbox="526 1289 1166 1320">Kirchhoff's Law</td> <td data-bbox="1166 1289 1302 1320">7</td> </tr> <tr> <td data-bbox="526 1348 1166 1379">Meters</td> <td data-bbox="1166 1348 1302 1379">8</td> </tr> <tr> <td data-bbox="526 1407 1166 1438">LR circuits</td> <td data-bbox="1166 1407 1302 1438">9</td> </tr> <tr> <td data-bbox="526 1465 1166 1497">RC and LRC circuits</td> <td data-bbox="1166 1465 1302 1497">10</td> </tr> <tr> <td data-bbox="526 1524 1166 1556">Geometrical Optics</td> <td data-bbox="1166 1524 1302 1556">11</td> </tr> <tr> <td data-bbox="526 1583 1166 1614">Focal Length of Lenses</td> <td data-bbox="1166 1583 1302 1614">12</td> </tr> <tr> <td data-bbox="526 1642 1166 1673">Diffraction Grating</td> <td data-bbox="1166 1642 1302 1673">13</td> </tr> </tbody> </table> <p><b>Final Exam: August 11 ; 5:30 pm</b></p>	<b><u>EXPERIMENTS</u></b>	<b><u>EXPER. NO.</u></b>	Speed of Sound	1	Specific Heat	2	Heat of Fusion	3	Electric Field	4	Ohm's Law	5	Wheatstone Bridge	6	Kirchhoff's Law	7	Meters	8	LR circuits	9	RC and LRC circuits	10	Geometrical Optics	11	Focal Length of Lenses	12	Diffraction Grating	13
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<b>Instructional Methods</b>	Standard laboratory instructions.																												

<b>Student Assignments</b>	No special assignments. Please answer all lab questions.
<b>Student Assessment(s)</b>	The overall score is based on the following: <ul style="list-style-type: none"> <li>• Lab Reports 70%</li> <li>• Final Exam 30%</li> </ul> Overall Score = 0.70(Average of lab reports) + 0.30(Final Exam)
<b>Instructor's Requirements</b>	<b><u>Lab Exams and Make-up Policy</u></b>  The instructor will be review General laboratory rules and safety instructions. Except for the uniform circular motion experiment, the experiments themselves are non-hazardous. This one experiment will require the use of goggles. Experiments will be performed in-groups of 3 to 5 students. Each lab-report is due at the beginning of the next lab. Each report will be graded on a 100-point basis. Come on time and be prepared. Read the experiment before coming to class and complete any pre-lab questions. If you follow this practice, you will be much better organized when doing the experiments and your lab experience will be much more rewarding.
<b>Program/Discipline Requirements</b>	At the program level, the Physics Discipline strives to accomplish the Program Learning Outcomes, Student Learning Outcomes, and Learning Objectives as described above. We desire that you receive a challenging and rewarding experience in your physics classes at HCC which will prepare you well for future physics and related science courses that you may take in the future.
<b>HCC Grading Scale</b>	A = 100 – 90;.....4 points per semester hour B = 89 – 80: .....3 points per semester hour C = 79 – 70: .....2 points per semester hour D = 69 – 60: .....1 point per semester hour 59 and below = F.....0 points per semester hour FX(Failure to withdraw from the course) .....0 point per semester hour IP (In Progress) .....0 points per semester hour W(Withdrawn).....0 points per semester hour I (Incomplete).....0 points per semester hour AUD (Audit) .....0 points per semester hour IP (In Progress) is given only in certain developmental courses. The student must re-enroll to receive credit. COM (Completed) is given in non-credit and continuing education courses. To compute grade point average (GPA), divide the total grade points by the total number of semester hours attempted. The grades "IP," "COM" and "I" do not affect GPA.
<b>Instructor Grading Criteria</b>	The overall score is based on the following: <ul style="list-style-type: none"> <li>• Lab Reports 70%</li> <li>• Final Exam 30%</li> </ul> Overall Score = 0.70(Average of lab reports) + 0.30(Final Exam)
<b>Instructional Materials</b>	<b><u>Text Book:</u></b>  There is no formal text – book for this course. For lab manuals contact your instructor.

<p><b>HCC Policy Statement:</b>  <b>ADA</b>  <b>Academic Honesty</b>  <b>Student attendance</b>  <b>3-peaters</b>  <b>Withdrawal deadline</b></p>	<p>Access Student Services Policies on their Web site:  <a href="http://hccs.edu/student-rights">http://hccs.edu/student-rights</a></p> <p><b><u>Disability Support Services (DSS)</u></b>  “Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing, etc.) who needs to arrange reasonable accommodations must contact the Disability Services Office at the respective college at the beginning of each semester. Faculty are authorized to provide only the accommodations requested by the Disability Support Services Office.”</p> <p>If you have any special needs or disabilities which may affect your ability to succeed in college classes or participate in any college programs or activities, please contact the DSS office for assistance. At Southwest College , contact Donna Price at (713) 718-5165 or the Disability Counselor at HCC-Southwest: Dr. Becky A. Hauri at (713) 718-7909 . Contact numbers for the other HCC colleges are found in the Annual Schedule of Classes, and more information is posted at the HCC web site at <a href="#">Disability Services</a>.</p> <p><b><u>Academic Honesty</u></b>  “Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Disciplinary proceedings may be initiated by the college system against a student accused of scholastic dishonesty. Penalties can include a grade of "0" or "F" on the particular assignment, failure in the course, academic probation, or even dismissal from the college. Scholastic dishonesty includes, but is not limited to, cheating on a test, plagiarism, and collusion.” In <b>this class</b>, the penalty for willful cheating on exams is a <b>grade of F in the course</b>. This is the standard policy of the Physical Sciences department at Southwest College.</p> <p><b><u>Attendance Policy</u></b>  The HCCS attendance policy is stated as follows: “Students are expected to attend classes regularly. Students are responsible for materials covered during their absences, and it is the student's responsibility to consult with instructors for make-up assignments. Class attendance is checked daily by instructors. <i>Although it is the responsibility of the student to drop a course for non-attendance, the instructor has full authority to drop a student for excessive absences. A student may be dropped from a course for excessive absences after the student has accumulated absences in excess of 12.5% of the hours of instruction (including lecture and laboratory time).</i>”</p> <p>Note that 12.5% is 6 contact hours for a 1 semester hour course (3 hours lab), such as this one, which once per week in a normal 16 week semester. The class contact hours will stay the same irrespective of the term in which the course is offered. If circumstances significantly prevent you from attending classes, please inform me. I realize that sometimes, outside circumstances can interfere with school and I will try to be as accommodating as possible, but please be aware of the attendance policy.</p> <p><b><u>Policy Regarding Multiple Repeats of a Course</u></b>  “NOTICE: Students who repeat a course three or more times may soon face significant tuition/fee increases at HCC and other Texas public colleges and universities. If you are considering course withdrawal because you are not earning passing grades, confer with your instructor/counselor as early as possible about your study habits, reading</p>
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	<p>and writing homework, test-taking skills, attendance, course participation, and opportunities for tutoring or other assistance that might be available.”</p> <p><b>Last Day for Administrative and Student Withdrawals</b></p> <p>For 5 weeks , Summer II 2016 classes, this date is July 18. I urge any student who is contemplating withdrawing from the class to see me first! You may be doing better than you think. Either way, I want to be accessible and supportive. I do not believe in "weed out" classes, and I consider you to be much more than just a name or number! Note my office hours above; if you need assistance, I'm here to help.</p> <p>☞ <b>Policy Regarding Withdrawals</b> ☞</p> <p>Students desiring to withdraw from a class must do so by the above withdrawal date by filling out a <b>withdrawal form</b> at the registrar’s office. <i>After this date, instructors can no longer enter a grade of “W” for the course for any reason.</i></p>
<b>Distance Education and/or Continuing Education Policies</b>	<p>Access DE Policies on their Web site:  <a href="http://de.hccs.edu/Distance_Ed/DE_Home/faculty_resources/PDFs/DE_Syllabus.pdf">http://de.hccs.edu/Distance_Ed/DE_Home/faculty_resources/PDFs/DE_Syllabus.pdf</a></p> <p>Access CE Policies on their Web site:  <a href="http://hccs.edu/CE-student-guidelines">http://hccs.edu/CE-student-guidelines</a></p>
<b>Test Bank</b>	N/A
<b>Scoring Rubrics</b>	The lab reports are graded on the basis of completeness, neatness, and the correctness of the calculations tied to the experimental result. The pre- and post-lab questions are also checked. Each report is graded on a 100 point basis.
<b>Sample Assignments</b>	N/A
<b>Sample Instructional Methods/Activities</b>	N/A
<b>Evaluation for Greater Learning Student Survey System (EGLS3)</b>	“At Houston Community College, professors believe that thoughtful student feedback is necessary to improve teaching and learning. During a designated time, you will be asked to answer a short online survey of research-based questions related to instruction. The anonymous results of the survey will be made available to your professors and division chairs for continual improvement of instruction. Look for the survey as part of the Houston Community College Student System online near the end of the term.”

### Laboratory Report Guidelines:

#### **General Procedures:**

Please return every laboratory equipment used during the lab to its original location after you are done, unless otherwise instructed. Leave your area clean and organized. Take all necessary safety precautions and don't hesitate to ask for advice from the instructor if you are unsure how to safely operate a piece of equipment. Inform the instructor of any damaged, worn, unusable, or possibly dangerous equipment.

#### **Lab Grading:**

Your total laboratory average will count as 70 % of your course grade and the 30% is the weight given to the comprehensive final exam at the end of the course. The lab grade will be determined by the points you accumulate on each report.

***The report should include***

**1. A title page (5%)**

On this page print your name, title and number and date of the experiment.

**1.2 Pre-lab questions when available (10%)**

Answer all questions. Please use complete sentences and or show your steps neatly and clearly.

**2. The instruction pages (20%)**

These are the pages describing

2.1 The Purpose / or Objectives of the experiment

2.2 The Apparatus /or Equipment used in the experiment

2.3 The Theory

2.4 Procedures followed

**3. Data and observations (15% or 10%)**

Record all your measurements carefully in a tabular form.

**4. Data Analysis / Calculations. (50% or 35% when post lab questions are present.)**

Carry out all the calculations using your data showing your steps clearly. Draw graphs and diagrams whenever they are required and explain what your graph means. For instance if you have got a straight line graph, determine its slope and relate the slope to the physical problem at hand.

**5. Summary and discussion of the results (10%)**

This usually requires you to state how good your results are in comparison with the objectives you stated at the beginning of your report. Compare your results with accepted values and calculate the percentage error. Finally, discuss the sources of these errors and give other comments you would like to make about the working of the experiment.