BROOKHAVEN COLLEGE

Course Syllabus for University Physics II – PHYS 2426 – Sec 26501

Summer II- 2019

Instructor: Dr. Zohreh Hashami
Email: Zohreh@dcccd.edu

Office Hours: by appointment
Division Office: 972-860-4750

Lecture: MTWR 5:40-7:40 pm K-254
Lab: MTWR 7:50-9:50 pm K-251

Chaz Hafey: 972-860-4766

Catalog Description
The second semester of a calculus-based physics sequence for science, computer science, and engineering majors. Principles of electricity and magnetism, including circuits, electromagnetism, waves, sound, light and optics are studied. Performance of basic laboratory experiments supporting theoretical physics principles and applications of electricity and magnetism, including circuits, electromagnetism, waves, sound, light and optics. Also includes experimental design, data collection and analysis, and preparation of laboratory reports. (3 Lec., 3 Lab.)

Coordinating Board Approval Number 4001015703

Prerequisite
PHYS 2425. MATH 2414 (Calculus II). DREA 0093 or English as a Second Language (ESOL) 0044 or have met the Texas Success Initiative (TSI) standard in Reading.

Student Learning Outcomes
1. State the principles and laws of physics as they apply to electricity, magnetism, wave motion, acoustics and optics.
2. Identify and use relevant equations applicable to electricity, magnetism, wave motion, acoustics and optics.
3. Apply the concepts learned to solve theoretical problems and explain phenomena in the laboratory and in the outside world.
4. Perform laboratory experiments that illustrate important concepts and analyze the data gathered using scientific principles.
5. Develop skills for analytical thinking that are useful for problem solving in physics and other fields.
6. Participate in enrichment activities that lead to an appreciation of how physics has developed, how physics affects other fields and the relevance of learning physics.

Learning Outcomes for PHYS 2426 from THECB
1. Articulate the fundamental concepts of electricity and electromagnetism, including electrostatic potential energy, electrostatic potential, potential difference, magnetic field, induction and Maxwell’s Laws.
2. State the general nature of electrical forces and electrical charges, and their relationship to electrical current.
3. Solve problems involving the inter-relationship of electrical charges, electrical forces, and electrical fields.
4. Apply Kirchhoff’s Laws to analysis of circuits with potential sources, capacitance and resistance, including parallel and series capacitance and resistance.
5. Calculate the force on a charged particle between the plates of a parallel plate capacitor.
6. Apply Ohm’s law to the solution of problems.
7. Describe the effects of static charge on nearby materials in terms of Coulomb’s Law.
8. Use Faraday’s and Lenz’s laws to find the electromotive forces.
9. Describe the components of a wave and relate those components to mechanical vibrations, sound and decibel level.
10. Articulate the principles of reflection, refraction, diffraction, interference and superposition of waves.
11. Solve real-world problems involving optics, lenses and mirrors.
12. Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner.
13. Conduct basic laboratory experiments involving electricity and magnetism.
14. Relate physical observations and measurements involving electricity and magnetism to theoretical principles.
15. Evaluate the accuracy of physical measurements and the potential sources of error in the measurements.
16. Design fundamental experiments involving principles of electricity and magnetism.
17. Identify appropriate sources of information for conducting laboratory experiments involving electricity and magnetism.

Core Objectives

PHYS 2426 is part of the Life and Physical Sciences Component Area 030.
(i) Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method.
(ii) Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.
(iii) The following four Core Objectives are addressed in this course to fulfill this requirement:

- **Critical Thinking Skills:** to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.
- **Communication Skills:** to include effective development, interpretation and expression of ideas through written and visual communication.
- **Empirical and Quantitative Skills:** to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.
- **Teamwork:** to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.

Textbook

Course Outline
The course is divided into five units. See the Course Calendar on page 4 for topics included in each unit. The schedule containing the objectives, dates, related reading, problems and assignments is distributed separately.

Evaluation
Tests: There will be four tests during the semester. Tests will consist of conceptual questions and problems. Students must follow the Brookhaven College code of student conduct at all times during the course, and dishonesty will not be tolerated.

Lab experiments & Reports: There will be 10 experiments during the semester, each worth 30 points. The labs are listed on page 4. Making accurate measurements and recording and analyzing data will be required for the lab report. The format to be followed is discussed in the lab manual and during lab. Lab reports will be due as scheduled and late reports will not be accepted without permission.

Assignments: The schedule will contain assigned problems, questions and activities from the textbook which will be due as scheduled. There may also be open-book problem-sessions in lab which may be graded. Solving problems with understanding and confidence plays a vital role in Physics. Please plan to spend lots of time on problem-solving as it is vital to your success.

The final grade will be calculated as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>4 tests</td>
<td>400</td>
</tr>
<tr>
<td>10 lab reports</td>
<td>300</td>
</tr>
<tr>
<td>Assignments &amp; attendance</td>
<td>200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>900</strong></td>
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</tbody>
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Divide the total by 9 to obtain your final grade.

A = 90 to 100  B = 80 to 89  C = 70 to 79  D = 60 to 69  F = Below 60

Incomplete grades are given only when an unforeseen emergency prevents a student from completing the course work. Division chairs must approve all "I" grades.

CLASS POLICIES (on-campus classes)

All Policies can be accessed at the following link, but for your convenience they are summarized below: https://www.Brookhavencollege.edu/syllabusaddendum

1. The deadline for withdrawal is July 30(T), 2019. If you are unable to complete the course, it is your responsibility to withdraw, by filling in the appropriate forms. Failure to do so will result in a performance grade which may be an F.
2. You cannot drop more than 6 courses during your entire undergraduate career unless it qualifies as an exemption.
3. Failure to attend classes could result in a loss of financial aid. Please check with the Financial Aid Office prior to withdrawing.
4. All students must be certified. For on-campus courses it means you must attend at least one class before the certification date.
5. Students on F-1 visas cannot withdraw without permission of the International Student Advisor.
6. If you will be absent due to a religious holiday, let the instructor know at the beginning of the semester so alternate arrangements can be made.
7. If you need assistance due to a disability, you are responsible for notifying the Disability Services Office in Room S-136 so they can assist you.
8. DCCCD Colleges will charge additional tuition for students who register for a third or subsequent time for a course.
9. Code of Student Conduct – Your registration in this course implies your acceptance of the DCCCD Code of Student Conduct. As a college student you are considered a responsible adult and no form of scholastic dishonesty will be tolerated. Scholastic dishonesty includes but is not limited to cheating on a test, plagiarism and collusion.
10. Students may access their grades during the semester on eCampus and their final letter grade on eConnect.
11. The Family Educational Rights and Privacy Act (FERPA) gives students certain rights with respect to their educational records. See complete statement at the link above.
12. DCCCD policy prohibits harassment, discrimination and sexual misconduct.
13. The instructor reserves the right to add, delete or revise the syllabus.

Special Help
Please come and see me during my office hours if you need help during the semester. Meetings at other times can also be scheduled. Mr. Chaz Hafey and the physics tutors are available for assistance with problem-solving during the open lab/tutoring hours. Timings are posted in lab (K-251).

COURSE CALENDAR

| UNIT 1 | July 8-10 | Electric Forces & Fields, Gauss’ Law | Chapter 23, 24, 25 |
|        |         | Test 1 |                          |
|        | July 11 |        |                           |
| UNIT 2 | July 15-22 | Electric Potential, Capacitors and batteries | Chapter 26, 27 |
|        |         | Current and resistance, Direct current Circuits | Chapter 28, 29 |
|        | July 23 |        |                           |
|        |         | Test 2 |                           |
| UNIT 3 | July 24-July 30 | Magnetic Forces & Fields, Gauss &Ampere’s law | Chapter 30, 31 |
|        |         | Electromagnetic Induction, Inductors &AC circuits | Chapter 32, 33 |
|        | Aug 1 |        |                           |
|        |         | Test 3 |                           |
| UNIT 4 | Aug 5-7 | Electromagnetic waves | Chapter 34 |
|        |         | Reflection & Images, Refraction & Images | Chapter 37, 38 |
|        | Aug 8 |        |                           |
|        |         | Test 4 |                           |

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<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Lab</th>
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<tbody>
<tr>
<td>July 8</td>
<td>Lab Intro</td>
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<tr>
<td>July 9</td>
<td>Electrical Measurements</td>
<td>Lab 1</td>
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<tr>
<td>July 15</td>
<td>Equipotential Lines</td>
<td>Lab 2</td>
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<tr>
<td>July 16</td>
<td>Ohm’s law</td>
<td>Lab 3</td>
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<td>July 17</td>
<td>Resistors in Series &amp; Parallel</td>
<td>Lab 4</td>
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<tr>
<td>July 24</td>
<td>Kirchoff’s Laws</td>
<td>Lab 5</td>
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<td>July 25</td>
<td>RC Circuits</td>
<td>Lab 6</td>
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<tr>
<td>July 29</td>
<td>Coulomb’s Law</td>
<td>Lab 8</td>
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<tr>
<td>July 30</td>
<td>Oscilloscope</td>
<td>Lab 10</td>
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<tr>
<td>Aug 2</td>
<td>Geometrical Optics</td>
<td>Lab 13</td>
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<tr>
<td>Aug 5</td>
<td>Focal length of convex lens</td>
<td>Lab 14</td>
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