

COURSE SYLLABUS

PHYS 1422 – Introduction to Physics II

Credit Hours: 4

Spring 2018

Lecture: Farrington Building, Room 209

9:00 –9:50 MWF

Lab: Farrington Building, Room 209

2:00-4:50 W

Instructor: Dr. James B. Dent
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Office hours: Farrington 216 B 1pm MWF, or by appointment

Catalog Description: This is a four credit-hour introductory course on Electricity & Magnetism.

Course Description: This course will introduce the student to the subject of electricity and magnetism. There are obviously a tremendous number of technological advances that have arisen from the study and application of this subject, and it also represents one of the greatest intellectual achievements not only in fundamental physics, but in all of science.

We will begin with the study of electrostatics and magnetostatics before turning to electrodynamics and the unified form of electromagnetism. We will cover electric charge, electric forces and fields, electric potential, the basics of DC circuits, magnetic forces and fields, electromagnetic induction, AC current, electromagnetic waves, and optical phenomena. We will see that the entirety of the subject can be described by the four Maxwell equations along with the Lorentz force law. If time permits, we will introduce special relativity as well.

This is a challenging subject, and the best way to succeed is to attend the lectures, take careful notes, ask questions, and most importantly: do the homework problems. Regularly and honestly working on the assigned problems is the surest way to succeed in this course. The problems also provide insight into what your instructor finds to be the most relevant and important when it comes

to creating quizzes and exams. I am available during office hours for help with any difficult or confusing topics or problems.

Prerequisites: PHYS 1411 and MATH 1430 (may be taken concurrently with department approval).

Required Textbook: Fundamentals of Physics, tenth edition by Halliday, Resnick and Walker

Required Supplies: Note-taking devices and a scientific calculator.

Assignments: Homework assignments will be given on roughly a weekly basis throughout the course duration. The absolute best way to gain expertise in this subject is to do the homework assignments. The homework is where you will get to apply the concepts introduced in lecture, which will greatly deepen your understanding of the subject. Your in-class quizzes will closely resemble your homework problems.

Exams: Three major examinations will be given during the semester (number is subject to reevaluation) along with a comprehensive final. If a special situation exists which would cause you to miss an exam, this **MUST** be made known to me prior to the date of the test if possible.

Grading Plan: You will be given regular quizzes covering material from the previous lecture and current homework. The quizzes will be worth 10% of your grade. The Lab portion of the course will be worth 20% of your grade. The best two of three exam scores will be worth a total of 45%, and the final exam will be worth 25%.

Class Rules: All class members are expected to respect the proceedings of this course, and the learning environment of their fellow students. This principle has several practical implications, some of which are enumerated below.

- 1) Do not cheat. Violators are subject to dismissal on a 1st offence.
- 2) Regular punctual attendance is expected of all class members.
- 3) There is to be no use of internet connected devices in the classroom, for either voice or text communication. Please discreetly excuse yourself if it becomes necessary to take a call.

Week-by-Week Schedule

PHYS 1422 is the standard second semester calculus-based course in physics offered by universities around the world to continuing physics and engineering majors, as well as the students of several other hard science disciplines. The list of topics taught in this course is very well standardized. The following schedule, which provides a rough sequential summary of the expected coverage, is subject to revision at discretion of the instructor.

Week 1	Electric Charges and Coulomb's Law
Week 2	Electric Fields
Week 3	Electric Flux and Gauss' Law
Week 4	Voltage and Electric Potential Energy
Week 5	Capacitance
Week 6	Current and Ohm's Law
Week 7	Circuits and Kirchhoff's Laws
Week 8	Magnetic Fields and the Lorentz Force
Week 9	Enclosed Current and Ampere's Law
Week 10	Faraday's Law of Induction
Week 11	Maxwell's Equations
Week 12	Electromagnetic Waves
Week 13	Interference and Diffraction
Week 14	Lenses and Ray Optics
Week 15	Special Relativity

Standard University Policies

The following are university-wide official policies which apply to this course. Additional details are available at the web address: <http://www.shsu.edu/syllabus/>

ACADEMIC DISHONESTY: All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials. For a complete listing of the university policy, see:

<http://www.shsu.edu/dept/dean-of-students/index.html>

CLASSROOM RULES OF CONDUCT: Students are expected to assist in maintaining a classroom environment that is conducive to learning. Students are to treat faculty and students with respect. Students are to turn off all cell phones while in the classroom. Under no circumstances are cell phones or any electronic devices to be used or seen during times of examination. Students may tape record lectures provided they do not disturb other students in the process.

STUDENT ABSENCES ON RELIGIOUS HOLY DAYS: Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. Section 51.911 (a) (2) defines a religious holy day as: “a holy day observed by a religion whose places of worship are exempt from property taxation under Section 11.20....” A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.

University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed. For a complete listing of the university policy, see:

</dept/academic-affairs/documents/aps/students/861001.pdf>

STUDENTS WITH DISABILITIES POLICY: It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the university policy, see: <http://www.shsu.edu/dotAsset/7ff819c3-39f3-491d-b688-db5a330ced92.pdf>

VISITORS IN THE CLASSROOM: Only registered students may attend class. Exceptions can be made on a case-by-case basis by the professor. In all cases, visitors must not present a disruption to the class by their attendance. Students wishing to audit a class must apply to do so through the Registrar's Office.

USE OF TELEPHONES AND TEXT MESSAGERS IN ACADEMIC CLASSROOMS AND FACILITIES: The use by students of electronic devices that perform the function of a telephone or text messenger during class-time may be prohibited if deemed disruptive by the instructor to the conduct of the class. Arrangements for handling potential emergency situations may be granted at the discretion of the instructor. Failure to comply with the instructor's policy could result in expulsion from the classroom or with multiple offenses, failure of the course. Any use of a telephone or text messenger or any device that performs these functions during a test period is prohibited. These devices should not be present during a test or should be stored securely in such a way that they cannot be seen or used by the student. Even the visible presence of such a device during the test period will result in a zero for that test. Use of these devices during a test is considered de facto evidence of cheating and could result in a charge of academic dishonesty. See: <https://www.shsu.edu/dept/dean-of-students/documents/2016-2018%20Student%20Guidelines.pdf>