University Physics II

PHYS 2523-P01Summer II 2015

Instructor Name: Dr. Cleo L. Bentley, Jr.
Office Location: 330AB New Science Building
Office Phone: 936-261-3138, 3140
Fax: 936-261-3149
Email Address: clbentley@pvamu.edu
USPS Address: P.O. Box 519
Mail Stop 2230
P.V. TX 77446
Office Hours: M-R 3:40-6:00 p.m.

Class Location: Room 307 NSB
Class Meeting Days & Time: MTWR 1:00 – 3:40 p.m.
Catalog Description: Credit 3 semester hours. A continuation of calculus-based general physics. Course includes heat and thermodynamics, sound, electricity, magnetism, optics, and select topics from modern physics.

Prerequisites: Physics lab II and integral calculus.
Co-Requisite: MATH 2024 and PHYS 2521.

Text: Wolfgang Bauer, "University Physics with Modern Physics," 2nd Edition, McGraw Hill Pub.

Access to Learning Resources:
PVAMU Library:
Phone: 936-261-1500
Web: http://www.tamu.edu/pvamu/library/
University Bookstore:
Phone: 936-261-1990
Web: https://www.bkstr.com/Home/10001-10734-1?demoKey=d

Course Goal or Overview:

The purpose of this course is to give the student a calculus-based exposure to oscillations, sound, heat and thermodynamics, electricity, magnetism, optics, relativity and some modern physics in which he, or she, will be challenged and evaluated for understanding.

Course Outcomes:

Upon completing this course the student will have knowledge many concepts in general physics with calculus, an enhanced applied knowledge of differential and integral calculus, trigonometry, algebra, vector operations to include vector addition, dot product, cross product, Cramer's rule for simultaneous equation solutions, experience in solving many word problems in math and physics associated with standard concepts, enhanced understanding of how things work in mechanical, heat, sound, electrical, magnetic, optical and relativistic systems, and the like.

At the end of this course, the student will…

		Core Curriculum Objective
1	Students will demonstrate knowledge of calculus and solve problems involving differential equations, integral equations and abstract manipulation of variables used to describes the laws of mechanics and motion	Critical Thinking & Empirical/Quantitative skills
2	Students will develop proficiency in the calculus methods of basic differential operations, derivatives, integral equations and the application of such methods to solving physics problems	Critical Thinking & Empirical/Quantitative Skills
3	Students will understand and demonstrate knowledge of calculus-based physics by utilizing writing and speaking tools through invention, organization, drafting, correcting and presentation of acquired knowledge	Communication and Personal Responsibility
4	Students will demonstrate knowledge by understanding the importance of specifying audience and purpose through the selection of appropriate communication tools	Empirical/Quantitative skills and Communication
5	Students will demonstrate knowledge and solve problems dealing with laws of	Empirical/Quantitative

motion and calculus-based techniques using complex interpretation of data and theories	skills and Communication
Students will demonstrate their mastery of physics notions through collecting and analyzing data, computer simulations, class-room discussions and participating effectively in groups with emphasis on reflective thinking.	Teamwork and Communication

Course Policies:

This course uses a lecture/workshop (practice field of the mind) format. Reading and homework assignments will be made, and some problems will be graded. Frequent quizzes (expected everyday) will check for concept understanding immediately following concept introduction with examples in class. It is expected that you will need to spend at least two hours studying outside the class for each hour spent in class.

Course Requirements & Evaluation Methods

1. Your grade will be based on class participation in the form of explaining problems and taking quizzes (extra points to buffer your exam scores--you get paid for everything that you do), and three major exams (covering about five current chapters each).
2. Attendance should be maintained. Particularly, there is no way to make-up a quiz or lab missed, but if you miss a quiz, 1 point is taken.
3. Remember: 'To hear is to forget, to see is to know, to do is to understand'.
4. Your final grade will be based on your overall average falling in the following categories: A--from 90 to 100; B--from 75 to 89; C--from 60 to 74; D--from 40 to 59; F-under. In this course all three exams have values of 100 points each. The final grade is determined from the total points from the 100 point exams and post-assessment exam with each correct answer valued at 0.5 point, plus all extra points from daily quizzes (up to about 3 points each), (other extra points are competitive on the first-hand-recognized basis, so one must study and practice to build self confidence to produce correct answers before your classmates do) impromptu questions (1 point each), working problems at the board (up to 2 points each), specific advanced homework problems (0.5 point each) on the following total point basis:

280—300 +	A
230—279	B
180—229	C
120—179	D
0—119	F

5 WEEK CALENDAR

Weeks	Topic	Note
0-2.5	COURSE CONTENT This course is the second half of a two semester course in general physics designed for students of science and engineering who have had only trigonometry. The objective of the course is to enhance the students' quantitative and logical mental skills through the study of physics. It is desirable that the physics learning environment be a microcosm of the professional world--that is, the system of evaluation is to reflect the effort, as well as cleverness, that is produced by the student. Each student is "paid" extra points for class participation outside the major exams and laboratories. A list of what this course will cover and the tentative timetable is found below. FIRST 2.5 WEEKS Chapters 14-16—oscillations, simple and damped harmonic motion, simple and physical pendula, wave equation, transverse and longitudinal waves, sound waves, boundary reflections, standing waves, resonance, interference, sound intensity, Doppler effect. Chapters 17-20 Celsius, Fahrenheit, Kelvin, and Rankin temperature scales, coefficient of linear and volume expansion. Heat measurement, specific heat capacity, calorimetry, phases of matter,	

	heats of fusion and vaporization. Transfer of heat by conduction, convection, and radiation. Ideal gas equation, barometric equation, Boyle's law, Charles' law, Gay-Lusaac's law, relative humidity. Thermodynamics, adiabatic process, isothermal process, isobaric process. Heat engines, Carnot engine, entropy. Kinetic theory. Wave equation, transverse and longitudinal waves, sound waves, boundary reflections, standing waves, resonance, interference, sound intensity, Doppler effect. Review. First major exam. Chapter 21-24--History of electricity, induced charges, Coulomb's law, Electric fields, Gauss's law, Electrical potential, Capacitors in series and parallel, energy of a charged capacitor, effect of dielectric, polarization and displacement vectors. Chapter 25-26--Battery, current, Ohm's Law, resistivity, resistance, electrical work and power. Electromotive force, voltage, physiological effects of currents, resistors in series and parallel, Kirchhoff's rules, ammeter, voltmeter, ohmmeter, Wheatstone bridge, R-C circuit. Chapters 30-35--Magnetism, right-hand rule, magnetic flux, magnetic field, cyclotron, magnetic moment, galvanometer, ballistic galvanometer, electric motor, Biot-Savart law, Ampere's law, induced electromotive force, Faraday's law, Len's law, Maxwell's equations. Mutual and self inductance, R-L circuit, R-L-C circuit, magnetic permeability, magnetization, magnetic intensity, magnetic susceptibility, ferromagnetism, hysteresis loop, reluctance. Review. 2nd Major Exam	
2.5-5	SECOND 2.5 WEEKS Alternating currents, capacitive reactance, R-L-C series circuit, impedance, R-L-C parallel circuit, root-mean-square values, resonance, transformer Poynting vector, Antenna, spectrum of electromagnetic waves, nature and propagation of light, laws of reflection and refraction, index of refraction, Huygen's principle, total internal reflection, geometric optics, lenses and mirrors. The eye, defects of vision, lens prescriptions, interference and diffraction. Chapter 36-39--Special theory of relativity. (Optional) Planck's hypothesis, photoelectric effect, Compton effect, atomic spectra, Bohr theory of hydrogen. Review. 3rd (Final) major exam.	

University Rules and Procedures

Disability statement (See Student Handbook):
Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

Academic misconduct (See Student Handbook):
You are expected to practice academic honesty in every aspect of this course and all other courses.
Make sure you are familiar with your Student Handbook, especially the section on academic misconduct.
Students who engage in academic misconduct are subject to university disciplinary procedures.

Forms of academic dishonesty:

1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.

2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.

3. Fabrication: use of invented information or falsified research.

4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else's words, ideas, or data as one's own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one's own work also constitutes plagiarism.

Nonacademic misconduct (See Student Handbook)
The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor's ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean of Students under nonacademic procedures.

Sexual misconduct (See Student Handbook):
Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

Attendance Policy:
Prairie View A&M University requires regular class attendance. Excessive absences will result in lowered grades. Excessive absenteeism, whether excused or unexcused, may result in a student's course grade being reduced or in assignment of a grade of 'F'. Absences are accumulated beginning with the first day of class.

Student Academic Appeals Process
Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructors assessment of their academic performance, the student has a right to appeal by the procedure listed in the Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.