

INTRODUCTION TO MODERN PHYSICS PHYS 3305 (FALL 2020) SYLLABUS

Instructor: Professor Bob Kehoe **Office:** Fondren Science 113
e-mail: kehoe@physics.smu.edu **Phone:** (214) 768-1793
 Fax: (214) 768-4095

Texts: "Modern Physics", 2nd edition, Randy Harris

Prerequisite: differential and integral calculus, scientific calculator

Class Coordinates: Tues. & Thurs. 12:30p.m – 1:50p.m. in Rm 158 Fondren Science
(or online as arranged per semester)

Office hours: 10am-12noon Thursday, or by appointment

Course Objectives: To provide an overview of the physics of the 20th century. Students will familiarize themselves with special relativity and quantum mechanics. They will also study the physics of nuclei, atoms and semiconductors. Modern applications will be discussed. Problem solving skill development will also be an emphasis of the class.

Method of Instruction: The class will consist of lectures. Homework is the foundation of your effort to acquire skill in using the material in the course. It will be due on each Tuesday following the week the material is covered and will be worth 20% of the course grade. No late homework is accepted.

Quizzes and Tests: There will be one mid-term exam, and one final exam. The mid-term will make up 20% of the class grade. The final is cumulative over the whole course and counts for 25% of the grade. There will be weekly 15 minute quizzes during the semester, scheduled on Tuesdays of each week. These will provide 20% of your grade. The lowest quiz grade will be dropped. Each quiz covers material since the last test or quiz. Tests and quizzes are closed book. You may bring a single 8.5"x11" sheet with important formulas and constants relevant for the material on each test and quiz.

Oral Communication Presentations: Two distinct presentations will be included in the course on a special topic in Modern Physics selected by the students. These presentations will be organized into overarching themes among several groups of 3-4 students each in the class. Each student will have an individual presentation that is a subtopic of the overarching group theme. Over the course of the semester, students will receive instruction in best practices for good public speaking and guidance on a methodical development of the oral presentation. Online resources and videos will be provided that enhance this instruction and give examples. These assignments will develop until in the 2nd half of the semester each student delivers a 15-20 minute scripted oral presentation to the class. Each student will assess their peers' performance, and these assessments will be included in their own assessments. Once the scripted presentations are finished, at the end of the semester each

student will also deliver an unscripted presentation which will not be live in front of the class. The total contribution of the Oral Communication component will be 25% of the course grade.

Objective: Students will acquire and demonstrate an ability to communicate a technical subject to a peer audience in one scripted and one unscripted contexts.

Measurement: The student will perform a series of preliminary steps leading to the presentation of a modern physics topic by the end of the course.

Grading and Attendance Policy: In all cases, it is *crucial* to show your work to get credit for solutions to physics problems. Regrading requests must be well-justified in writing. Anticipated absences resulting from religious observance or officially sanctioned extracurricular activity must be brought to the instructor's attention at least 2 weeks in advance. Affected quizzes or tests will be given prior to the rest of the class. No other make-up quizzes or tests will be granted.