UNIVERSITY OF TEXAS AT EL PASO
PHYSICS DEPARTMENT

Spring, 2017

PHYS 2210 VIBRATIONS AND WAVES

Class Days:	T: 10:00 – 11:20 am PSCI, Room: 218
Instructor:	**Dr. Huiyan Yang**
Office:	Physical Science Building, Room: 215B Phone: (915)747-7510, E-mail: hyang4@utep.edu
Office Hours:	MW: 10:00 – 11:00 am or by appointments
Prerequisite Courses	PHYS 2420 or Cal I
Textbook:	***Required:*** **Physics for Scientists and Engineers**: A Strategic Approach, 4th Edition, by Randall D. Knight. Online study tool: MasteringPhysics (MPYANG03202) (Homework is assigned and graded in MasteringPhysics. All students are required to have access of MasteringPhysics.) ***Recommended:*** **Fundamentals of Acoustics**, Lawrence E. Kinsler, Austin R. Frey, Alan B. Coppens, James V. Sanders, 4th Edition **Vibrations and Waves**, A. P. French, CBS Publishers & Distributors

Course Objectives and Outcomes

This course will be devoted to the study of vibrations and waves and its applications in different fields of physics. The principal objective is to develop an understanding of basic wave concepts and of their relations with one another. Study of topics such as free and forced oscillations, superposition principle, traveling and standing waves, wave packets, bandwidth and polarization, will serve to reach the proposed goal. Applications to different physical systems will be illustrated through interesting examples.

Vibrations and waves are present in a vast variety of physical phenomena. The oscillating pendulum, a vibrating violin, vibrating electrons, light bouncing back and forth in a laser, are only a few examples of these phenomena. From engineering applications to observational astrophysics, the physics of vibrations and waves is a necessary knowledge. Thus, to understand the unifying principle behind their different manifestations is essential in modern physics and technology. On the other hand, studying the realization of these phenomena in different fields of physics, we will show how things, that at first glance appear totally disconnected, are related.

Instructional Methods and Activities

Students will meet in lectures. Lectures will include discussions of problems, as well as presentations of the conceptual materials. Students will be expected to have read the textbook chapter at least once before it is lectured on and once after. Independent study and discussion are fundamental to minimize the effect of "getting dizzy."

Attendance is expected although not mandatory. Nevertheless, the students are responsible for the lost activities, as well as for any lost class information and announcement.

Evaluation and Grade Assignment

There will be three midterm exams and a comprehensive final. Exams will emphasize, mainly, the material covered since the previous one. They will be based on the worked out examples in the text, the worked out examples in class, and homework problems.

Evaluations: Homework 30%; Quizzes 10%; Exams 30%; Final Exam 30%

Course Schedule: Tentative List of Topics: may change with class activity

- 1: Oscillations (Ch 15)
- 2: Traveling Waves (Ch 16)
- 3: Superposition (Ch 17)
- 4: Electromagnetic Waves (Ch 31)
- 5: Wave Optics (Ch 33)

Make-up Policy: No credits will be given for missed homework. Make up exams are given only on extraordinary cases of severe illnesses or emergencies. They can be arranged at the discretion of the instructor. In all cases a written excuse and official documents will be required and investigated.

Attendance Policy: Attendance is not required but recommended. When it is necessary to miss class, it is the student's responsibility to check with classmates or the instructor to determine what content was covered and what assignments were made.

Academic Integrity Policy: Acts of academic dishonesty will not be tolerated in this class. Lapses in academic integrity will be referred to the Dean of Students, as required at http://academics.utep.edu/Default.aspx?tabid=23785.

Civility Statement: This course requires positive behaviors: Be on time and be focused on your work. Please do not distract yourself or others with telephones or music.

Disability Statement: If a student has or suspects he/she has a disability and needs an accommodation, he/she should contact the Center for Accommodations and Support Services (747-5148 or cass@utep.edu). or go to Room 106 Union East Building. The student is responsible for presenting to the instructor any CASS accommodation letters and instructions.

Military Statement: If you are a military student with the potential of being called to military service and /or training during the course of the semester, you are encouraged to contact me as soon as it appears that your service will interfere with this course. The instructor will work with you to ensure that your service will not adversely affect your academic progress.