

**THE UNIVERSITY OF TEXAS AT EL PASO  
COLLEGE OF SCIENCE  
DEPARTMENT OF PHYSICS**

<b>Course #:</b>	PHYS 2210 CRN 22837
<b>Course Title:</b>	Vibrations and Waves
<b>Credit Hrs:</b>	2.0
<b>Term:</b>	Spring 2019
<b>Course Meetings &amp; Location:</b>	Tue 1:30PM – 2:50 PM, Chemistry and Computer Science Building (CCSB)1.0202
<b>Instructor:</b>	<b>Dr. José Leo Bañuelos</b>
<b>Office Location:</b>	PSCI 215C
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<b>Emergency Contact:</b>	(915) 747 5715
<b>Office Hrs:</b>	Tue 10:30 am – 12:30 pm and by appointment
<b>Textbook(s), Materials:</b>	Physics for Scientists and Engineers, Knight, 4 <sup>th</sup> edition. It can be bought bundled with Mastering Physics (the online homework).

**Course Objectives (Learning Outcomes):**

The objective of PHYS 2210, Vibrations and Waves, is to provide students with a rigorous description of forced and coupled oscillations of transverse waves and longitudinal waves. We will learn about the influence or boundary effects and interference as well as non-linear oscillations and chaos. We will study the following topics: Simple Harmonic Motion, SHM and Circular Motion, Energy and SHM, The Dynamics of SHM, Vertical Oscillations, The Pendulum, Damped Oscillations, Driven Oscillations and resonance, Introduction to Waves, One-Dimensional Waves, Sinusoidal Waves, The Wave Equation on a String, Sound and Light, The Wave Equation in a Fluid, Waves in Two and Three Dimensions, Power, Intensity, and Decibels, The Doppler Effect, The principle of superposition, Standing Waves, Standing Waves on a String, Standing Sound Waves and Musical Acoustics, Interference in One Dimension, Mathematics of Interference, Interference in Two and Three Dimensions, and Beats.

**Grading Policy:**

Grades in this course will be based on your scores on two midterm exams, a final exam (comprehensive; but with emphasis on the last part of the course), laboratory, homework assignments, and in-class participation.

Midterm exams:	50% (25% each)
Final exam:	25% (comprehensive)
In-Class participation	5%
Homework/Quizzes:	20%

**Course Activities/Assignments:**

**1. Homework**

It is essential you develop good problem solving methods: this includes developing writing skills to set up a problem, including diagrams and mathematical manipulation to achieve the final answer. A

numerical score will be assigned for each homework set. **Please do not fall behind because future material generally depends on previous material. Seek help immediately.** Please form study groups with your classmates and seek help from the lecture professor and any TA during his/her office hours as you attempt to solve problems. Attend the tutoring sessions offered for this course (schedule to be posted on Blackboard). Make sure that you understand the solutions and write them up yourself!

**Tutoring:** There is a tutor available for this specific class. **Nathan Episcopo** (nepiscopo@miners.utep.edu) will be your tutor this semester. Please take advantage of this opportunity and attend his tutoring sessions. Tutoring schedule will be provided directly by Nathan.

**REGISTER FOR ONLINE HOMEWORK BY FOLLOWING INSTRUCTIONS:** *Pearson Student Registration Handout\_PHYS2210\_SP2019\_banuelos81053* in the “**Instructions, Guides, Resources**” link on your Blackboard Home Page

**There are several online homework access options:**

- 1. Provide the access code given to you when you purchased the textbook.**
- 2. Purchase the electronic text (e-text) plus 3e Tech update.**
- 3. Purchase the 3e Tech update only.**

**EACH STUDENT WILL NEED HIS/HER OWN ONLINE ACCESS PACKAGE FOR THE HOMEWORK AS THE BARE MINIMUM PURCHASE FOR THIS COURSE.**

Homework will be announced in advance in the lecture (approximately every week). Each will consist of problems based on the course material as well as an extra credit Adaptive Follow-Up exercise for those scoring less than 85%.

## **2. In-class Participation**

You are required to install the iClicker Reef Student App which is a device polling system that will be used during each lecture to answer questions in class and record your in-class participation. Download iClicker Reef and create a new account if you do not already have one. Search for my iClicker course: **PHYS 2210 CRN 22837 SPRING 2019.**

Your participation in **iClicker REEF** polling sessions each lecture will be used to monitor your attendance in this semester's course (**worth 5% of your grade**). Make sure your mobile device (laptop, cell phone, etc) is charged **BEFORE** coming to class.

Short quizzes will be given occasionally in class, or assigned to be completed online before class. These will be based on pre-class assigned reading or short videos. If not announced in the previous session, these may be announced via email so please check your email often.

## **3. Exams**

Exams will consist of problems very similar to the worked example problems in the text and the assigned homework problems. Exams will be closed-book unless I state otherwise. You should bring with you a pocket calculator to work out the answers to numerical problems: **make sure the battery is charged.** Cell phone use is **NOT ALLOWED** during the exams!

Dates of the midterm exams will be announced in class ahead of time. **The final exam will take place Thursday, May 16<sup>th</sup> from 1:00pm-3:45pm in CCSB 1.0202.** For information regarding

UTEP's final exam policy visit the link: <https://www.utep.edu/student-affairs/registrar/Internal/Links/Final%20Exam%20Schedule%20Spring%202019.pdf>

The best way to prepare for the exams is to study the example problems, work out the assigned homework problems regularly, and complete any revision guides given to you.

You should work as many additional problems from the text as you can: this is the best way to ensure your understanding of the material.

**Make-up Policy:**

An extension of the due date for the homework as well as the make-up of missing exams will be granted only in extraordinary circumstances. Late homework will be penalized at a rate of 8% of the maximum score for each day it is late.

**Attendance Policy:** No credit will be granted for just attending the class. You are expected to arrive to class on time, and participate in all problem-solving exercises.

**Academic Integrity Policy:**

A fundamental principle for any educational institution, academic integrity is highly valued and seriously regarded at The University of Texas at El Paso. More specifically, students are expected to maintain absolute integrity and a high standard of individual honor in scholastic work undertaken at the University.

Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

Please see: <https://www.utep.edu/student-affairs/osccr/student-conduct/academic-integrity.html> for more information and the UTEP Handbook of Operating Procedures: <https://www.utep.edu/vpba/hoop/>

**Civility Statement:**

Cell phones and pagers should be turned off during class time.

When absences occur, it is your responsibility to obtain handouts and notes from your peers. When possible you will complete the activities you have missed.

Academic integrity is to be practiced at all times.

**Disability Statement:**

If you have a disability and need classroom accommodations, please contact the Center for Accommodations and Support Services (CASS) at 747-5148, or by email to [cass@utep.edu](mailto:cass@utep.edu), or visit their office located in UTEP Union East Building, Room 106. For additional information, please visit the CASS website at <https://www.utep.edu/student-affairs/cass/>. The student is responsible for presenting to the instructor any 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 the instructor at the beginning of the semester.