PHYSICS 3310

Relaytivity and Waves

TuTh 8:00 AM-9':20 AM

Clements Hall Room 324 Spring 2021

INSTRUCTOR Roberto Vega
Office: 105 Fondren Science Bldg
email: vega@mail.physics.smu.edu
Telephone: 214-768-2498

OFFICE HOURS By arrangement.

Suggested Texts *Special Relativity* by A.P. French, *Vibrations and Waves* by A.P. French, *Waves and Oscillations* by Frank S. Crawford, Jr.

GRADING The final course grade will be determined a follows. Homework 50%, exams 50%.

Objectives:

Waves are ubiquitous and the principal manner by which we receive information about the physical world around us and by which we communicate with human beings. Understanding waves is essential to understanding the physical universe. You have already learned some wave physics in your previous courses but here we will study them systematically with an eye to learning the most general principles governing their behavior.

A vastly important property of the physical universe is that physics laws appear the same to a careful observer in any uniformly moving reference frame. This has surprising, even startling, consequences which we will learn when we study the "special" theory of relativity in the second portion of the course. .

Learning Outcomes:

Upon completion of this course students shoud able to:

- Determine the equation of motion of a one-dimensional damped simple harmonic oscillator;
- Calculate eigenfrequencies and eigenmodes for simple systems of coupled oscillators;

- Calculate normal modes and energy content of a waves in a continuous, homogeneous system;
- Calculate reflection and refraction effects at boundaries of dielectrics and metals;
- Calculate interference patterns from a simple multiple slit barrier.
- Explain the two basic postulates of special relativity;
- Explain what an inertial reference frame is and a practical way to tell if you are in one.