

PHYSICS OF SOUND AND MUSIC - PHYS 1406, Fall 2009

Instructor: Walter L. Borst, Professor of Physics

Office hours: MWF 9:45-11:15 p.m., SC 11, Tel. 742-3864, e-mail: Walter.Borst@ttu.edu

Lecture: Tuesday, Thursday 11:00-12:20 a.m., Science Room 10

Laboratory Sections, Science Room 302:

PHYS 1406-501 Monday 4:00-5:50 p.m.

PHYS 1406-502 Tuesday 2:00-3:30 p.m.

PHYS 1406-503 Wednesday 4:00-5:50 p.m.

PHYS 1406-504 Tuesday 4:00-5:50 p.m.

Textbook:

Richard E. Berg and David G. Stork, *The Physics of Sound*, 3rd ed., Pearson/Prentice Hall, 2005.

Recommended supplemental books for more detailed studies:

Donald E. Hall, *Musical Acoustics*, 3rd ed., may be available “inexpensively” online

Juan G. Roederer, *The Physics and Psychophysics of Music*, Springer Science+Business Media, 2008.

Laboratory Manual:

John N. Como and Walter L. Borst, “The Physics of Sound and Music – Laboratory Manual”, Fall 2009 edition. Please purchase the manual at The Copy Outlet, 2402 Broadway Street, Lubbock

Course Topics

Basic physics for acoustics and sound

Waves and harmonic motion

Analysis and synthesis of waves

Human hearing and voice

Sound intensities, decibel scale

Environmental sound and noise

Room acoustics

Elementary music theory, musical temperament

Musical instruments

In-class performances by students and music faculty

Sound recording and reproduction

Class demonstrations

Course Materials: Your lecture notes, class demonstrations, textbook, laboratory reports

Grades

3 Examinations, 15% each; homework=quizzes 15%; laboratory 20%; final examination 20%.

Grade Scale: 100-A-86-B-72-C-58-D-44-F-0

Laboratory

The laboratory is an important part of the course. We try to make it interesting. Attendance and doing the laboratory work is required. Attendance counts for 30% of the laboratory grade. A minimum laboratory score of 70% is required for passing the entire course.

Homework and Quizzes.

Homework will be assigned regularly – see the *calendar* for an approximate schedule. The homework will not be graded because of the large class size and manpower considerations. Do the homework carefully, know it for the quizzes! The homework due dates generally coincide with the quiz grades. Always be prepared for class. The quiz grades are the homework grades.

Examinations

The examinations are closed books. They cover concepts and applications from class, lecture notes (take good notes!), class demonstrations, laboratory, homework, and the textbook to the extent covered in class. You may bring a formula sheet with up to 20 formulas to the examinations, not the quizzes – formulas only, no words. Also bring a simple calculator and ruler. No make-up examinations will be given. In case of a serious emergency, please contact the instructor to find out how the missing grade will be determined.

Attendance is required.

Sign in at the beginning of class. So please be there a few minutes early. The class is large and the room is small. Please excuse yourself whenever you have to be absent. Otherwise, 1% off the course total for each unexcused absence.

Important: Spend at least 5 hours each week on this course outside of class.

Examination, Laboratory, and other Dates: See Calendar

Examination Security

The examinations are made specifically for this semester. They include a copyright notice reserving all rights of reproduction and distribution.

Disability

Any student with a disabling condition, who may require special arrangements in order to meet course requirements, should contact the instructor as soon as possible so that necessary accommodations can be made. Proper documentation about the disability must be presented from the Dean of Student's office.

Academic honesty is assumed and violations will be pursued according to the Student Handbook.

Course objectives and expected learning outcomes:

Learn some physical principles and be able to apply them to sound, acoustics, music, everyday life.

Methods for assessing the learning outcomes:

1. Examinations and grades.
2. Class discussions.
3. Feedback from students about the usefulness of the course.