

## **PHYSICS OF SOUND AND MUSIC - PHYS 1406**

The course satisfies the 4-hour lab-science requirement in the Natural Science Core Curriculum.

**Instructor:** Dr. Walter L. Borst, Professor of Physics

**Office hours:** Tuesdays, Thursdays 9:00-10:00 a.m. 12:30 – 1:00 p.m. immediately after class.  
SC 11, Tel. 742-3864, e-mail: walter.borst@ttu.edu.

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

**Laboratory:** Sign up for a laboratory section PHYS1406-501 (Monday 4:00-5:50 p.m) or PHYS1406-502 (Tuesday 2:00-3:50 p.m.). Location: Room 302, Science Bld., South wing.

### **Required Text**

**PHYSICS OF SOUND AND MUSIC, PHYS 1406, COURSE GUIDE AND LABORATORY MANUAL, Spring 2013** - Walter L. Borst.

The Guide contains the course topics, homework, quizzes and examinations.

The Laboratory Manual is included in the Guide. **YOU MUST HAVE THE GUIDE.**

It is available only at CopyOutlet, 2402 Broadway, Lubbock, Tel. 744-7772.

Bring the Guide with you to class and the laboratory. Add your notes to it.

### **Course objectives and outcomes:**

Become familiar with scientific principles of sound, acoustics, and music.

### **Topics**

Waves, sound, music

Harmonics, sound quality (timbre)

Analysis and synthesis of sound

Room acoustics

Musical sound, noise

Musical instruments

Voice and hearing

Sound recording and reproduction

Many class demonstrations on sound and music

Performances by TTU faculty and students in class

### **Grades**

3 Examinations 45%, quizzes = homework grade 20%, laboratory 15%, final examination 20%.

Grade Scale:

**100-A-86-B-72-C-58-D-44-F-0** - see below for extra credit

**Laboratory** - See the **Calendar** for the weeks in which the laboratory meets.

Attend all 10 laboratories. Reports are required.

Obtain a minimum laboratory score of **75%** to pass this course.

Always bring the “Course Guide and Laboratory Manual” with you to the laboratory.

Add notes for writing the laboratory reports.

**Homework, Quizzes, Examinations.** Homework assignments, sample quizzes and examinations are in the Course Guide. Quiz and examination questions are taken from the Course Guide, lectures, laboratories, and homework. See also the **Calendar**.

Note: **Quiz Grade = Homework Grade.** (Homework will not be graded separately.)

### **Examinations and Quizzes**

The examinations and quizzes cover what is discussed in class, in the Course Guide, lecture demonstrations, homework, and laboratories. You may use the Course Guide as an “open book” during the examinations and quizzes.

Bring a **simple calculator and ruler** with you - you will need these items!

Make-up examinations and quizzes generally are not given. In case of an emergency tell, call, or write Dr. Borst and find out how a missed grade will be handled.

### **Extra Credit**

1. **Attending Music Performances (5%):** Attend some of the great performances by the School of Music. Consult its calendar for dates. Most performances are free. Hand in a **typed 1-page report** for each performance and staple the program to it. Each report counts as 1% extra towards the course grade, with a total up to 5%. Performances of the Lubbock Symphony and the TTU Music Theater count as well. Include in your report the highlights of the performance and how it **relates to class**. The reports are **due within one week** after the performance. Attend performances throughout the semester (not just at the end to improve grades).

2. **Research Paper (5%):** Topics may include human hearing and voice, room acoustics, environmental sound, musical instruments, basic music theory, electronic recording, sound processing. Propose a topic to your instructor. Your report should consist of 4-5 typed pages, including problem statement, references, tables, and graphs, as applicable.

Submit your **research paper no later than two weeks before the last day of classes**.

**Class Attendance Required.** Sign your name on the attendance sheet before the start of each class. In case of an emergency, excuse yourself with e-mail to [walter.borst@ttu.edu](mailto:walter.borst@ttu.edu).

An unexcused absence results in a deduction of 1% from the course total.

**Study Time:** Study for about **3-5 hours each week** outside of class to obtain a good grade.

### **Required Disability Statement**

Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office.

### **Methods for assessing learning outcomes**

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

**Academic honesty** is assumed - see also Student Handbook.