Syllabus
Physics 1270.753 Honors (with Lab)
The Science and Technology of Musical Sound
Fall 2014

Instructor: Dr. Duncan Weathers, Associate Prof. of Physics  Time: MWF 9:00-9:50 a.m.
Location: Physics Bldg 311  Office: Phys 003/ 565-2079
Office Hrs: M 1:00–3:00 p.m. (and by appointment)  e-mail: weathers@unt.edu
TA: Jacob Baxley  TA Office: Phys 004

Electronic Student Participation: You will be issued a Response Card (RC) keypad for use during the lecture. The Response Card will then be your responsibility. If lost, damaged or stolen you must replace it at your own expense. See further instructions later in the syllabus.

Course overview: This course is an introduction to the physics of sound as it relates to the production, propagation and perception of music. We will explore the properties of sound and the physical characteristics of various musical instruments (including the human voice) to understand how they speak and how we perceive them.

Calculator: You will need a “scientific” calculator with square root, log, and \( y^x \).

Expectations: As a student in this course, I expect you to (1) attend class, (2) read the text assignment (check “parallel readings” in schedule) prior to coming to class, and (3) to engage actively in the experiences I have designed for your learning. After class, the PowerPoint™ for that and the previous lectures will be posted on the web. Other helps are also available in Black Board™. You are expected to attend lab weekly. It counts as 25% of your overall course grade.

Homework: Reading and homework assignments will be made. Homework will not be graded but feedback will be provided via the web.

Grading: 75% Lecture—this part of your grade will determined from in-class examinations and a research paper.
25% Lab—see lab manual or on-line policies for lab grading.

Final Examination: Please note that the final exam is 8:00-10:00 a.m. Wednesday, December 10, in the Auditorium Bldg. (This is one hour earlier than the regular class time!) Suggestion: Put it on your calendar.

Extra Credit: Attendance (for extra credit) will be taken by means of participation as assessed through RC responses in class.

The University of North Texas is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 92-112 – The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans with Disabilities Act (ADA), pursuant to section 504 of the Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

This document is for informational purposes only and is subject to change in writing as needed. Rev. 8/23/14
Objectives for Physics 1270
The Science and Technology of Musical Sound

I have many objectives for this course; they fall into two categories: goals for you, the student, and goals for me, your instructor.

Objectives for Learning

Students will

- Learn the principles, facts, and skills that will enrich their life and professional development
  - By building an understanding of the chief principles of the physics controlling the production, manipulation and reproduction of musical sound;
  - By forming lasting memories of the essential facts of musical acoustics;
  - By improving their skills of abstract analysis of physical situations;
- Acquire a scientific habit of mind for intellectual inquiry that will persist throughout their life;
- Reaffirm the values of civility, humanity and scholarship;
- Grow in appreciation for the physical world and the scientific way of knowing it;
- Awake to wonder and delight in discovery.

Objectives for Teaching

The instructor will

- Build a learning community where students feel welcomed, safe to explore and valued by their instructor and peers;
- Engage students’ interest and emotions;
- Create memorable learning opportunities;
- Challenge and motivate students to work at learning diligently and efficiently;
- Generate a positive affect regarding the subject by a contagious and unfeigned enthusiasm;
- Ever seek better and more effective means of teaching and communicating the content of his discipline;
- Remain a perpetual learner himself, forever searching out new information and relevant applications to incorporate into his instruction, and thereby modeling for students true scholarship;
- Act in a fair, ethical, professional, understanding, and wise manner.

Core Course Objectives

This course satisfies the core course requirement by fostering skills associated with four core objectives:

1. **Critical thinking** - analysis, evaluation, and synthesis of information.
2. **Effective communication** - development, interpretation, and expression of ideas through written, oral, and graphical means.
3. **Quantitative skills** - the ability to compute and manipulate quantitative data and to reach meaningful conclusions.
4. **Teamwork** - the ability to consider different points of view and to work effectively as a team.
About the Response Card

What does it do?

This is a unique course in which students are asked to respond frequently to questions and quizzes, as well as with hypotheses or even wild-eyed guesses during the face-to-face sessions. In this way everybody can get in on the fun of doing physics, even in a large class.

We use the Response Card (RC) technology to make this possible. We have purchased for you at a discounted price (using part of your course fees for this course) a response card that looks something like Figure 1. If you have not received yours yet, e-mail your instructor immediately so that we can get you “wired” for class.

In class when a question appears on the screen like that you see in the following figure 2, you will push the button that corresponds to your choice and the key pad will send the information to the classroom computer along with the identification as to which key pad sent the answer. That way—if we have registered your key pad number in the system—I can know how you are doing and help you out if you need it. You can know, too, how many of your classmates answered the same way when we reveal the expected answer and the class distribution.

![Figure 1: The Radio Frequency Response Card (RC) used in Physics and Astronomy classes](image)

![Figure 2: A sample of an in-class quiz that you can answer with your RC.](image)
Registering your RC keypad:

You have one job to do before the classroom will recognize your key pad: register it. We plan to assist you in doing this when you are issued your card. You can go on-line at http://learn.unt.edu and click on “Register Your Clicker.” Before you do that, look at the back of the RC. Just below the bar code you will find a six (6) character code. It will be a combination of numbers and/or the letters A, B, C, D, E, or F. This is you RC device code and it is unique to your keypad.

Look at the photograph and locate where the code is appears.

Now, find the code on your keypad and make a note of it and keep it handy for the last step.

My RC # is __ __ __ __ __ __

To register your RC go to the RC Management Page on-line and click on “RC Registration.” This will take you to a link where you can enter the code and get it registered.

When you come to class you will need to set the channel number. The next section will describe how to do that when you come to class.

Setting the channel

For the classroom computer to “hear” your Response Card (RC) your device must be set to the appropriate channel. To set the channel, depress and hold the “GO” button located in the lower left hand corner of the keypad for two seconds. The light will flash alternately red and green. Then depress the two digit number that corresponds to the channel number assigned to the classroom. Your instructor will tell you the channel number when you come to class. The light will turn green when the channel is correct. Then you are “good to go.”

What if the RC does not work?

Occasionally the RC arrives with a protective plastic battery insert that protrudes from the back. If the device does not respond in any way, check that the plastic is removed. A firm tug on the plastic strips is adequate to remove them.

If there are no plastic strips and the unit still does not activate, the batteries may be dead. If the unit is a used device this is likely the case. The typical battery life is about one and a half to two semesters. If your RC does not respond at all please have it checked by the TA after class.
Grade Policy for Physics 1270
The Science and Technology of Musical Sound

Grades are a quantitative measure of your mastery of the content of this course and your attainment of its objectives. Two types of assessment will be used to assign grades: (1) in-class examinations and (2) laboratory exercises.

In-class Examinations

<table>
<thead>
<tr>
<th>Type</th>
<th>Points</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Exams (100 each)</td>
<td>200</td>
<td>20%</td>
</tr>
<tr>
<td>Mid-term</td>
<td>150</td>
<td>15%</td>
</tr>
<tr>
<td>Final exam</td>
<td>300</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td>650</td>
<td>65%</td>
</tr>
</tbody>
</table>

Research Paper

<table>
<thead>
<tr>
<th>Type</th>
<th>Points</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab exercises</td>
<td>100</td>
<td>10%</td>
</tr>
</tbody>
</table>

Laboratory exercises

Course Grade Assignment

We will use the standard correspondence between percentage and letter grade assignment. Thus,

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1000 – 900 (&gt;90%)</td>
</tr>
<tr>
<td>B</td>
<td>899 – 800 (&lt;90% but ≥80%)</td>
</tr>
<tr>
<td>C</td>
<td>799 – 700 (&lt;80% but ≥70%)</td>
</tr>
<tr>
<td>D</td>
<td>699 – 600 (&lt;70% but ≥60%)</td>
</tr>
<tr>
<td>F</td>
<td>&lt;600 (&lt;60%)</td>
</tr>
</tbody>
</table>

Extra Credit—Class Attendance and Participation

Class attendance and participation will earn extra credit. For each day that you are present and participate in the activities using the Response Card you will be credited with one additional point. It is, therefore, possible to earn 42 points of extra credit or nearly one half of a letter grade. Attendance and participation will be determined solely by the electronic record produced from your Response Card responses. It is therefore, imperative that you obtain and use the Response Card if you wish to receive extra credit. Moreover, forgetting the card, having dead batteries, failure to register the card or other technical malfunctions do not commonly excuse loss of credit for a day even if you are physically present.

*If the final exam grade is higher than the computed average exam grade, then the final will be assigned as the examination portion of the grade.

UNT’s policy on Academic Dishonesty can be found at: [http://www.vpaa.unt.edu/academic-integrity.htm](http://www.vpaa.unt.edu/academic-integrity.htm)

Drop information is available in the schedule of classes at: [http://essc.unt.edu/registrar/schedule/scheduleclass.html](http://essc.unt.edu/registrar/schedule/scheduleclass.html)
A Note on Civility

- Treat all persons with the respect you desire in return.
- Respect yourself and practice integrity.
- Avoid all coarse, demeaning or profane language.
- Think and act professionally and responsibly.
- Engage this subject with whole-hearted enthusiasm.
- Practice practical and active consideration for the instructor and classmates.

UNT endeavors to offer you a high-quality education and to provide a supportive environment to help you learn and grow. And, as a faculty member, I am committed to helping you be successful as a student. Here’s how to succeed at UNT:

- Show up
- Find support
- Take control
- Be prepared
- Get involved
- Be persistent

To learn more about campus resources and information on how you can achieve success, go to www.succeed.unt.edu.