Physics 153N
Science of Sound
Winter 2009
General Course Policies and Information

Instructor:

Dr. Mark Gealy
Office: Ivers 134G, 299-3391
e-mail: gealy@gloria.cord.edu
Office Hours: Appointment or discovery

Required Materials:

The Physics of Sound 3rd Ed, R.E. Berg & D.G. Stork, Prentice Hall, 2005
Laboratory Manual for Science of Sound:, M.W. Gealy *et al*, Concordia College (nothing to buy; manual will be created as we go)

Scientific Calculator (must handle trig functions and their inverses, exponential functions, logarithms and scientific notation)

Course Objectives:

- learn basic principles underlying scientific inquiry: methods, philosophy, strengths and limitations
- learn fundamental physical concepts underlying forces, motion, waves, sound and music
- gain experience in laboratory observations and measurements
- continue to develop critical thinking and reasoning skills
- improve analytical and numerical problem solving skills
- clearly communicate scientific information orally and in writing

---

Course Content:

- Survey of philosophy and epistemology of science
- Motion, forces; Newtonian mechanics applied to oscillating systems
- Waves in general and sound in particular
- Wave Superposition, Complex Waves, Sound Spectra
- Wave Interference and Diffraction
- Perception of Sound: Pitch, Loudness, Timbre
- Human ear and voice
- Sound recording and reproduction
- Room & auditorium acoustics
- Musical temperament and pitch
- Instrument Families: Winds, Brass, Strings, Piano, Percussion

---

Course Structure:

Class meets Mondays, Wednesdays and Fridays. Class time will consist of a mixture of lecture, discussion, demonstrations and group problem-solving activities. These meetings will require active participation by all and this is only possible if you have prepared for class. Reading and homework assignments will be given weekly.

Two-hour laboratory will be held weekly. Activities will include demonstrations, experiments, observations and measurements. Modest weekly writing assignments pertaining to laboratory activities will be completed and turned in for grading.

Course Grading:

The final grade will be based on the following distribution of work:

Unit exams (3) 18% each
Weekly Homework 20%
Weekly Laboratory 20%
Attendance/Participation 6%

Exams

There will be three unit exams taken in class during the semester. The last of these will not be comprehensive.

Exam dates are:
Exam 1: **Wednesday, February 4, 2009**
Exam 2: **Wednesday, March 19, 2009**
Exam 3: **8:30am Friday, May 1, 2009**

Homework

You will turn in (approximately) weekly homework assignments for grading. All responses to questions must be presented as complete thoughts and sentences. Problems worked mathematically must include clear exposition of steps: Relevant equation(s) must be stated, numbers substituted appropriately, and units presented. You (or any other person informed in the subject) should be able to understand your answer/solution from beginning to end. Remember that you are not just answering questions and solving problems, you are communicating your work to an informed reader.

Late work will not be accepted so if you have not completed an assignment, be sure to turn in as much as you have and you will get credit for as much as you have done. If you will be absent, you are responsible to get your assignment in before you are gone. The lowest homework score will be dropped.

While you are encouraged to work together to complete the homework, each student must submit her or his own work and not simply copy another paper. Students submitting papers bearing too much similarity will be charged with plagiarism. The result will be a score of zero on that assignment for both involved parties and written notification of the incident to the Dean's Office. Subsequent offenses will be punished more severely at the discretion of the instructor, possibly with a grade of zero for the homework, or even failure of the course.

Laboratory

There will be weekly laboratory exercises, including written material to be turned in at the beginning of the next lab meeting. There is no substitute for the learning that comes from rigorous laboratory work. Consequently, ***a failing grade in lab will result in a failing grade for the course***.

Policies:

No late work will be accepted. If you know of an absence in advance, (including college related activities), it is your responsibility to notify the instructor and turn in all assignments by the due date. In the case of an extended illness or emergency, notify the instructor as soon as possible so appropriate arrangements can be made.

It is especially important to take each exam at the time it is scheduled. If you have a scheduled conflict with any of the exam dates listed, you must notify the instructor within the first two weeks of the semester. If the conflict cannot be resolved, then your 'make-up' test must be taken ***before*** *the other students take the same test.* This merely requires that your missed work be made up prior to your departure.

A grade of incomplete will only be given in case of serious illness or extended emergency and must be discussed with the instructor as soon as possible. An incomplete will not be given as a substitute for dropping the course.

Every effort will be made to score exams and assignments fairly and consistently. Any request for re-grading must be made in writing within one week of the time the work was handed back. The original, unmodified, document must accompany the request.

Academic Integrity

You should remember that Concordia College is committed to the highest standards of academic integrity. Cheating in any form will not be tolerated. Cheating (stealing answers on an exam), plagiarism (representing someone else's work as your own), and "dry-labbing" (falsification of data on a lab write-up) are usually very easy to detect. In this course, there are three major components of graded written work, representing three different degrees of collaboration. **1)** You must work with other students on laboratory activities. Some written responses to lab questions will be your own and some will belong to your group. For example, it would be appropriate for all members of a lab team to present identical graphs illustrating your group's data. **2)** You are encouraged but not required to work together on homework assignments. However, you must prepare your own papers for submission. If two or more homework papers are too similar, you will be charged with plagiarism, for which the minimum penalty will be a score of zero on that assignment. **3)** No collaboration is allowed on exams. You may ask the instructor for clarification of exam questions. If you have any questions about whether any action would be considered inappropriate, please discuss it with the professor in advance. If you are in doubt what constitutes a violation, please refer to the handbook, Academic Integrity at Concordia College.

Every violation of academic integrity is taken very seriously. Any act of academic dishonesty will result in at least zero points for the assignment or exam in question, which will not be dropped as the lowest score when calculating a final grade. The instructor reserves the right to fail a student for the course who cheats, regardless of the importance of the assignment or exam in the determination of the final grade. All violations of academic integrity will be referred to the Academic Dean for disciplinary action who may impose additional penalties, including course failure, suspension, or dismissal from the college.

As stated in the Academic Integrity handbook, "When we permit or facilitate the dishonesty of others, we too are guilty of an equally serious violation." To this end, you are expected to behave as a partner in creating and maintaining an honest academic community. Failing to report integrity violations is itself a violation of academic integrity and will be treated as such. All concerns about academic integrity will be treated confidentially.