PHY2010 – Physics for Audio Engineering
Dr. Hawley
Course web page: http://hedges.belmont.edu/~shawley/PHY2010/

Invitation:
Recording and live sound technologies are advancing at an unprecedented pace, and yet the underlying physical realities -- vibration and sound -- remain unchanged. Regardless of the fancy gear and 'magical' software that may come to bear, the generation and capture of sound waves themselves is a set of phenomena which must be understood intimately in order to render quality tone and to make decisions about design, construction and troubleshooting. In this course, you will gain an in-depth knowledge of the most fundamental process -- driven, damped simple harmonic motion -- and how it relates to such diverse phenomena as quartz watches, guitar bodies and medieval Scandinavian churches. You will be able to apply principles of sound propagation such as the inverse square law -- called "The most important physics for all of audio" -- to a variety of recording and amplification tasks. You will gain an understanding of the physical workings of industrial acoustical devices -- e.g. cardioid subwoofer arrays -- and will gather the conceptual and mathematical tools needed to distinguish between valid and bogus claims made by gear manufacturers. You will learn the necessary techniques to set up and evaluate a suitable acoustical space such as your own home studio. You will embark on an intriguing group research project to investigate an acoustical topic of your choosing, applying your knowledge from this class to something you've long wondered about. You will be placed on the path to being an extremely competitive, innovative and adaptive audio engineer in a marketplace saturated by cookie-cutter drones.

In order to get there, you will need *daily reinforcement*, which will need to be *self-motivated* and *self-directed*. Such reinforcement will take the forms of

- *Preparation:* reading textbook & lab manual selections *prior* to class/lab. Any barriers holding you back (e.g., math) will be dealt with or at least flagged for the instructor's attention.
- *Practice:* completing homework assignments in a timely fashion, working with additional problems to "get it down" – similar to learning an instrument
- *Persistence:* maintaining regular reinforcement activities, no "cramming"
- *Perseverance:* Understanding may not come easily, but it will eventually come.

For further details, see "How to Succeed in This Course", page 5 of the Syllabus.

You will be held to a high standard. Your work will need to be thorough, correct, organized, and clear. (Further details are on page 5 of the Syllabus – "Academic Standards.") If you fail to do your part, the professor's oral instruction alone will be insufficient to impart to you the knowledge and skills needed to even 'squeak by' in this course. As a result of doing your part, however, you will gain a sense of accomplishment and competency you did not know you possessed. Furthermore, your investment in this course has a high likelihood of translating into increasingly rewarding and employable skill sets.

"So it begins."