

EE417: Acoustics and Audio Engineering
Fall Semester 2010

WRITTEN REPORT ASSIGNMENT

Each student enrolled in the course is required to write a concise written report dealing with some topic related to acoustics and/or audio (several example topics are given below). The paper should represent a college-level treatment of the chosen topic. Several considerations will guide your choice of topic and format:

- Choose a topic you are interested in, *but* make sure you have sufficient reference material to produce a comprehensive treatment. Look for up-to-date books in the library, check journals and periodicals, use the web, and follow up on other sources of information. Your paper should include a bibliography of at least four *pertinent* and *authoritative* references, not just uncorroborated web site URLs.
- The paper should be written in formal style, but at a level appropriate for reading by another student in this class who is not necessarily familiar with the topic. Imagine that you are writing a background report at work for reading by your project team or for your technical manager.
- Organize your paper according to the following outline:
 - Paper must be prepared with a word processor and printed using a high-quality printer.
 - Overall length expectation: 5-10 pages.
 - Please use 1" margins on all edges of the paper.
 - All pages numbered consecutively.
 - A **cover sheet** with:
 - your name
 - the title of your paper
 - the course number, course title, and semester
 - An **introduction** providing an overview of the topic and the paper.
 - Two or more **sections** containing the report and significance of the findings.
 - A **conclusion and summary** section including suggestions for other info sources.
 - A complete **bibliography** organized by author, including all reference info.
 - If needed, include an **appendix** of reference data, e.g., component data sheets.
- DUE DATES:
 - Monday, 11/8/10: A **one paragraph summary** of paper topic (I will read these, and comment if necessary)
 - Friday, 12/3/10: Final copy of paper **turned in** (due at the start of class that day)

TOPIC IDEAS:

These are some *possible* paper topics: note that you do *not* necessarily need to choose from this list!

Testing of Loudspeakers
Methods for Artificial Reverberation
Musical Acoustics of String Instruments
Musical Acoustics of Percussion Instruments
Acoustical simulation using Matlab
Manufacture of Compact Discs and DVDs
Design of Audio Power Amplifiers
Design of Fixed/Variable Analog Filters Using Op Amps
Circuit Design, Component Selection and Layout for Audio Purposes
History of Electronic and Computer Music
The Roles of Futurism, Dadaism, and Fascism in the Development of Electroacoustic Music
MIDI: the **M**usical **I**nstrument **D**igital **I**nterface **S**tandard
Contemporary DSP Chips for Audio Signal Processing
Digital Filter Basics
Operation Principles for a Specific Microphone Type
MP3: What it is and how it works
Auditorium Acoustics and Measurements
Listening Room and Studio Design
Digital Sampling and Sample Rate Conversion
Sonic Booms
Human Perception: Critical Bands and Masking
Binaural Localization
Aids for the Hearing Impaired
Testing Strategies for Psychoacoustic Experiments
Speech Production and Perception
Automatic Speech/Speaker Recognition
Noise Reduction Techniques for Analog Tape (Dolby™, dbx™, etc.)
The Telephone System
Active/Adaptive Noise Control
Analog/Digital/Analog Conversion
Noise Shaping for ADC and DAC
Digital Oversampling Theory and Practice
Measurement of Audio Equipment: Frequency Response, THD, etc.
Storage and Transmission Standards for Audio Signals