

EELE417: Acoustics and Audio Engineering  
Fall Semester 2012

### 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 meaningful 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 must include a bibliography of at least four *pertinent* and *authoritative* references, not just uncorroborated web site URLs.
- The paper must 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 saved as Adobe PDF.
  - 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:**

Friday, 11/9/2012 by 5PM MST: **Email** [rob.maher@montana.edu](mailto:rob.maher@montana.edu) a **one paragraph summary** of your paper topic (I will read these, and comment if necessary)

Wednesday, 12/5/2012 by 5PM MST: Final copy of paper **turned in** via D2L upload.

## TOPIC IDEAS:

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

Loudspeakers Testing Methods  
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 Considerations for an Audio Power Amplifier  
Design of Fixed/Variable Analog Filters Using Op Amps  
Circuit Design, Component Selection and Layout for Audio Purposes  
History of Electronic and Computer Music  
History of MIDI: the **M**usical **I**nstrument **D**igital **I**nterface Standard  
Contemporary DSP Chips for Audio Signal Processing  
Digital Filter Basics  
Operation Principles for a Specific Microphone Type  
Perceptual Audio Coding: Principles and Applications  
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  
Speech Production and Perception  
Automatic Speech/Speaker Recognition  
The Land-Line Telephone System  
Active/Adaptive Noise Control  
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