EELE 417:  Acoustics and Audio Engineering
Fall Semester 2014


**WRITTEN REPORT ASSIGNMENT**


Each student enrolled in the EELE 417 undergraduate course is required to write a concise written report dealing with some topic related to acoustics and/or audio.  Several example topics are given on the back of this sheet to get you thinking--but you need not choose from the list. 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 <u>of at least four</u> *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, 11/7/2014 by 5PM MST:  **Email** `rob.maher@montana.edu` a **one paragraph summary** of your paper topic (I will read these, and comment if necessary)

  Wednesday, 12/3/2014 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!

Loudspeaker 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
Concept and History of an Electronic Musical Instrument or 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