Instructor: Edward L. Goshorn, Ph.D.
Office: Room 207
Email: edward.goshorn@usm.edu
Phone: 601-266-5218

Office Hours: 01:00 – 03:00 P.M. MTWRF. The instructor encourages students to use email contact as needed to ask questions or seek clarification of assignments, etc.

Prerequisites: None
Credit Hours: 3

Course Description: Provides an in-depth examination of the auditory mechanism, including an examination of the form and function of structures in both the peripheral and central auditory systems.

2. Other readings, materials, handouts to be assigned as necessary.

Overview
This class is designed to permit Au.D. students to obtain in-depth knowledge of basic acoustics, physics of sound, measurement of sound, and a review of the auditory system, auditory processing, auditory perception, auditory signal manipulation, and includes a review of the form and function of structures in both the peripheral and central nervous systems. The student will be exposed to information regarding the normal function of the auditory system and will be expected to compare and contrast the normal auditory system with a pathological one. Auditory signal devices, fundamentals of acoustics, and digitization are reviewed.

Instructional objectives (KASA categories in brackets)
Students in this class will be able to:
- Perform basic math calculations associated with audiology [IVA]
- Demonstrate knowledge of basic physics as it is applied to acoustics [IVA]
- Describe simple harmonic motion (SHM), resonance, and free/forced vibrations [B13]
- Discuss complex vibrations and the decomposition of complex motion into SHM [B13]
- Describe the importance of grounding and shielding in electric circuits [B14]
- List and describe the common components of electric circuits [B14]
- Discuss the concepts of electroacoustic and electromechanic transduction [B13]
- Explain the nature of digital signals [B11]
- Describe the process of converting analog to digital signals and digital to analog signals [B11]
- Name the cranial nerves and their function [B4]
- Describe the basic components and function of the cochlea, semicircular canals, and VIII Nerve [B4]
- Describe the form and function of the peripheral auditory system as a whole [B4]
- Describe structures of the cochlear nucleus associated with temporal and frequency processing [B4]
- Describe the function of the superior olivary complex [B4]
- Discuss the role of the inferior colliculus in auditory processing [B4]
- Describe the importance of the thalamus in relation to central auditory processing [B4]
- Name the major and minor landmarks along the auditory pathway [B4]

**Instructional outcomes assessment**

Meeting the instructional objectives of the class will be determined as follows:
- Each student will be examined on each instructional objective
- Each student will write a paper that will require integrating knowledge of auditory anatomy and physiology and the effects of pathologies and/or abnormalities of the auditory system
- The student will make oral presentations on topics concerning bioacoustics and auditory physiology
- Students are expected to participate in classroom discussions and to ask pertinent questions.

**Class Attendance Policy:** Students are expected to attend class on time and on a regular basis. You are expected to be active, professional participants in the teaching and learning process. The instructor retains the right to assign negative values for class participation that will be applied to the student’s final average. Any such assigned negative values and the behavior causing them will be communicated to the student immediately. Unexcused absences will not be permitted and will result in a 5% decrease in the final grade for each unexcused absence. Please contact the instructor if you plan to be absent. Each tardiness >5 minutes will result in -1% points assessed to the student’s final average.

**Grading:** The final grade is based on 3-5 exams (each worth 100 points) and a term paper (worth -100 to +10 adjustment to final average). The total number of points you earn on exams will be divided by the total number of possible points. Your final average will be adjusted by the points earned on the written paper and classroom participation. That final adjusted percentage will be used to determine your grade according to the following scale:

<table>
<thead>
<tr>
<th>Percent</th>
<th>Grade</th>
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<tbody>
<tr>
<td>90-100</td>
<td>A</td>
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<td>80-89</td>
<td>B</td>
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<td>70-79</td>
<td>C</td>
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<td>60-69</td>
<td>D</td>
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<td>&lt;60</td>
<td>F</td>
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COURSE REQUIREMENTS:
A. Paper: Each student will write one term paper. The paper must be written double spaced in APA format, free of spelling and grammatical errors and must be five pages (plus or minus one) in length, not counting the title page, figures, and list of references or appendices. The paper will be graded on the basis of the attached grading format. A paper that meets the quality expected for a doctoral student will have zero points added to their final average. A paper that does not meet the quality expected of a doctoral student may have up to 10 points subtracted from their final average. An exemplary paper for a doctoral student may have up to ten points added to their final average. A penalty (-10 points) will be assessed to the final average for every day that a paper is late up to a maximum of -100. Each student will fill in the attached grading worksheet with his/her name, date, and title at the beginning of the paper. The topic for the paper must be selected from the list below. Your paper title will be more specific and descriptive than the topic descriptor.

LIST OF TOPICS
1. Cochlear mechanics
2. Electrical potentials in the inner ear
3. The role of the SOC in auditory processing, lateralization, localization, and selective listening
4. A detailed description of the afferent and efferent auditory pathway from pinna to cortex (anatomy) with a supplement consisting of a drawing or flowchart
5. Bone conduction processes in humans

Inform the instructor of your topic by the mid-point of the semester.

Knowledge and Skills
In this course you will acquire knowledge (areas of content that you can recall, relate and use) and skills (the learned capacity to do some task). Your acquisition of knowledge and skills will be assessed during the course of the semester (through formative assessment) and at the end of the semester (through summative assessments). Formative assessments will measure your progress during the course of the semester; they include (but may not be limited to) exams during the semester, your contributions to class discussions and your performance on classroom presentations. Should formative assessment of your progress indicate that you are not meeting the objectives of the class, you may be required to participate in remedial activities designed to permit you to successfully complete the course. Participation in those remedial activities, however, will not guarantee your successful completion of the course. The summative assessment (cumulative final examination) will determine if you have acquired the knowledge and skills expected of students completing the course.
COURSE CONTENT

I. Introduction – Syllabus Review
   i. Basic Graphs

II. Hearing Science (text): Sequence of Chapter Coverage (subject to change)

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th># Lectures</th>
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<tr>
<td>0. Glossary</td>
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<td>1. Mathematics</td>
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<td>2. Physics</td>
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<td>3. Oscillations and Vibrations</td>
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<td>4. Complex Vibrations and Waveform Analysis</td>
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<td>EXAM 1</td>
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<td>5. The Nature of Sound</td>
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<td>6. Sound Propagation</td>
<td>2</td>
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<td>7. The Decibel</td>
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<td>EXAM 2</td>
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<td>8. Outer Ear and Middle Ear</td>
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<td>9. The Inner Ear and Vestibulocochlear Nerve</td>
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<td>EXAM 3</td>
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<td>10. Central Auditory Nervous System</td>
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<td>11. Bone Conduction</td>
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<td>EXAM 4</td>
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<td>14. Audio Signals and Devices</td>
<td>2</td>
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<td>15. Digital Signal Processing</td>
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<td>EXAM 5</td>
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Total Lecture Days 18
Total Exam Days 5

Final Exam is Comprehensive (FINAL EXAM WEEK)

Academic Misconduct: Academic misconduct, such as cheating on exams or plagiarism, is not tolerated. Such behavior will be dealt with strictly and the most severe penalties permitted by the University of Southern Mississippi will be implemented.

Remediation:
Should formative assessments indicate that you are not meeting the objectives of the class, you may be required to participate in remedial activities designed to permit you to successfully complete the course (such as observation of others that are performing the task appropriately, assignment of additional literature review of the current topic area, or direct discussion of the
Disability:
If a student has a disability that qualifies under the American Disabilities Act (ADA) and requires accommodations, he/she should contact the Office for Disability Accommodations (ODA) for information on appropriate policies and procedures. Disabilities covered by ADA may include learning, psychiatric, physical disabilities, or chronic health disorders. Students can contact ODA if they are not certain whether a medical condition/disability qualifies.

Address: The University of Southern Mississippi Office for Disability Accommodations, 118 College Drive # 8586, Hattiesburg, MS 39406-0001. Voice Telephone: (601) 266-5024 or (228) 214-3232 Fax: (601) 266-6035 -Individuals with hearing impairments can contact ODA using the Mississippi Relay Service at 1-800-582-2233 (TTY) or email Suzy Hebert at Suzanne.Hebert@usm.edu
UNIVERSITY OF SOUTHERN MISSISSIPPI
DEPARTMENT OF SPEECH AND HEARING SCIENCES

Format for Grading a Term Paper

Student Name: _____________________ Date: ___________ Course: SHS 706

Paper topic or title: __________________________________________________________

Characteristics Considered                               Points

1. Scope/purpose of paper                               ________

2. Content                                            ________
   a. Material presented is relevant
   b. Breadth and Depth of discussion is appropriate

3. Literature Review                                   ________
   a. A sufficient number of sources are reviewed
   b. Each source is sufficiently reviewed

4. Reference List                                      ________
   a. Number of sources is sufficient for scope
   b. Appropriate for graduate level work

5. Clarity                                            ________
   a. Writing is clear, easily understood. Organization of paper is clear
   b. Complex ideas are explained adequately

6. Organization                                       ________
   a. Paper is presented in well thought out manner
   b. Headings are appropriate and sufficient

7. Spelling and grammar                                ________
   a. Paper is free of spelling and Grammatical errors

8. List of References                                  ________
   a. Sufficient for scope

9. Use of figures/tables                               ________
   a. Appropriate for content

10. Timeliness                                         ________
    a. Completed in accordance with time constraints.

Points Added to Final Average:                        ________