HESP 706: Advanced Clinical Audiology
Spring 2016
Department of Hearing and Speech Sciences,
University of Maryland, College Park

Instructor:	Samira Anderson, Au.D., Ph.D.	Email: sander22@umd.edu
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Meeting Time:	Wednesdays, 3:30 – 6:00 PM	
Meeting Location:	Lefrak Hall, Room 0135	
Prerequisites:	HESP 606	

COURSE SYLLABUS

REQUIRED READINGS

Required Texts:

Dhar, S. and Hall, J.W. (2012). *Otoacoustic Emissions: Principles, Procedures, and Protocols.* San Diego: Plural Publishing.

Katz, J. (2015). *Handbook of Clinical Audiology, 7th Edition.* Philadelphia: Lippincott Williams & Wilcott.

Recommended Texts:

Musiek, F. and Chermak, G. (2013) *Handbook of Central Auditory Processing Disorder, Volume I: Auditory Neuroscience and Diagnosis, 2nd. Edition.* San Diego: Plural Publishing.

Musiek, F. and Chermak, G. (2013) *Handbook of Central Auditory Processing Disorder, Volume II: Comprehensive Intervention, 2nd. Edition.* San Diego: Plural Publishing.

Hunter, L. and Shahnaz, N. (2013) *Acoustic Immittance Measures: Basic and Advanced Practice.* San Diego: Plural Publishing.

Module 1 Otoacoustic Emissions

January 27 Introduction; Site of Lesion Testing & Principles; Otoacoustic Emissions: Overview

Readings:

Dhar and Hall, Text, Chapter 1

Jedrzejczak, W. W., Kochanek, K., Sliwa, L., Pilka, E., Trzaskowski, B., & Skarzynski, P. (2012). Otoacoustic emissions for the evaluating the low-frequency hearing of patients considered for partial deafness treatment. Journal of Hearing Science, 2.

Kemp, D. T. (2002). Otoacoustic emissions, their origin in cochlear function, and use. *British Medical Bulletin*, 63, 223-241.

February 3 Otoacoustic Emissions: Anatomy and physiology, Classification
Demonstration of Lab 1 (due February 17)

Quiz 1

Readings:

Dhar and Hall, Text, Chapters 2 and 3

*Abdala, C., & Keefe, D. H. (2006). Effects of middle-ear immaturity on distortion product otoacoustic emission suppression tuning in infant ears. *The Journal of the Acoustical Society of America*, 120, 3832-3842.

Shera, C. A., & John J. Guinan, J. (1999). Evoked otoacoustic emissions arise by two fundamentally different mechanisms: A taxonomy for mammalian OAEs. *The Journal of the Acoustical Society of America*, 105, 782-798.

*Fitzgerald, T. S., & Prieve, B. A. (2005). Detection of hearing loss using 2f2-f1 and 2f1-f2 distortion-product otoacoustic emissions. *Journal of Speech, Language & Hearing Research*, 48, 1165-1186.

February 10 Otoacoustic Emissions: Clinical measurement: instrumentation, calibration, protocols

Presentation 1 - Mary

Quiz 2

Readings:

Dhar and Hall, Text, Chapters 4 and 5

*Garner, C. A., Neely, S. T., & Gorga, M. P. (2008). Sources of variability in distortion product otoacoustic emissions. *The Journal of the Acoustical Society of America*, 124, 1054-1067.

*Reuven, M.L., Neely, S.T., Kopun, J.G., Rasetshwane, D.M., Allen, J.B., Tan, H., and Gorga, M.P. (2012). Effect of calibration method on distortion-product otoacoustic emission measurements at and around 4 kHz. *Ear and Hearing*, 34, 779-788.

Joint Committee on Infant Hearing (2007). Year 2007 position statement: Principles and guidelines for early hearing detection and intervention programs. *Pediatrics*, 120, 898-921.

February 17 Otoacoustic Emissions: Clinical applications and efferent mechanisms

Presentation 2 - Calli

Quiz 3

Dhar and Hall, Text, Chapters 6-9

Readings:
*Abdala, C., Dhar, S., Ahmadi, M., & Luo, P. (2014). Aging of the medial olivocochlear reflex and associations with speech perception. *The Journal of the Acoustical Society of America*, 135(2), 754-765.

*Smith, D.W., Aouad, R.K., and Keil, A. (2012). Cognitive task demands modulate the sensitivity of the human cochlea. *Frontiers in Psychology*, 3.

*De Boer, J., Thornton, A.R.D., and Krumbholz, K. (2012). What is the role of the medial olivocochlear system in speech-in-noise processing? *J Neurophysiol*, 107**,** 1301-1312.

February 24 Advanced immittance measures
Demonstration of Lab 2

Presentation 3 - Maya

Katz, Text, Chapter 9

Readings:

Withnell, R. H., Parent, P., Jeng, P. S., & Allen, J. B. (2009). Using wideband reflectance to measure the impedance of the middle ear. *The Hearing Journal*, 62, 36.

Lilly, D.J., and Margolis, R.H. (2013). Wideband acoustic immittance measurements of the middle ear: introduction and some historical antecedents. *Ear and Hearing*, 34, 4s-8s

Sanford, C.A., Hunter, L.L., Feeney, M.P., and Nakajima, H.H. (2013). Wideband Acoustic Immittance: Tympanometric Measures. *Ear and Hearing*, 34, 65S-71S

*Prieve, B.A., Feeney, M.P., Stenfelt, S., and Shahnaz, N. (2013). Prediction of conductive hearing loss using wideband acoustic immittance. *Ear and Hearing*, 34, 54S-59S

March 2 Midterm

March 9 Advanced immittance measures

Demonstration of Lab 2 (due March 23)

Presentation 4 - Jane

Readings:

Nakajima, H.H., Rosowski, J.J., Shahnaz, N., and Voss, S.E. (2013). Assessment of ear disorders using power reflectance. *Ear and Hearing*, 34, 48s

*Shahnaz, N., Feeney, M.P., and Schairer, K.S. (2013). Wideband acoustic immittance normative data: ethnicity, gender, aging, and instrumentation. *Ear and Hearing*, 34, 27s

Hunter, L. L., Keefe, D. H., Feeney, M. P., Fitzpatrick, D. F., & Lin, L. (2015). *Longitudinal development of wideband reflectance tympanometry in normal and at-risk infants. *Hearing Research.*

March 16 Spring break

March 23 Tinnitus: Neural mechanisms

Presentation 5 - Kelly

Quiz 4

Readings:

Henry, J. A., Roberts, L. E., Caspary, D. M., Theodoroff, S. M., & Salvi, R. J. (2014). Underlying mechanisms of tinnitus: review and clinical implications. J Am Acad Audiol, 25(1), 5-22

*Gu, J.W., Herrmann, B.S., Levine, R.A., and Melcher, J.R. (2012). Brainstem auditory evoked potentials suggest a role for the ventral cochlear nucleus in tinnitus. *Journal of the Association for Research in Otolaryngology* 13**,** 819-833.

*Engineer, N. D., Riley, J. R., Seale, J. D., Vrana, W. A., Shetake, J. A., Sudanagunta, S. P. et al. (2011). Reversing pathological neural activity using targeted plasticity. *Nature*, 470, 101-104.

*Leaver, A.M., Renier, L., Chevillet, M.A., Morgan, S., Kim, H.J., and Rauschecker, J.P. (2011). Dysregulation of limbic and auditory networks in tinnitus. *Neuron*, 69, 33-43

*Roberts, L.E., Husain, F.T., and Eggermont, J.J. (2013). Role of attention in the generation and modulation of tinnitus. *Neuroscience & Biobehavioral Reviews*, 37, 1754-1773

March 30 Tinnitus: Assessment; Nonorganic hearing loss;
Demonstration of Lab 3 (due April 13)

Presentation 6 - Jen

Katz, Text, Chapter 33

Quiz 5

Readings:

*Meikle, M. B., Henry, J. A., Griest, S. E., Stewart, B. J., Abrams, H. B., McArdle, R. et al. (2012). The Tinnitus Functional Index: Development of a new clinical measure for chronic, intrusive tinnitus. *Ear and Hearing*, 33, 153-176

*Henry, J.A., Roberts, L.E., Ellingson, R.M., and Thielman, E.J. (2013). Computer-automated tinnitus assessment: noise-band matching, maskability, and residual inhibition. *Journal of the American Academy of Audiology*, 24.

Henry, J.A., Zaugg, T.L., Myers, P.J., and Schechter, M.A. (2008). The role of audiologic evaluation in progressive audiologic tinnitus management. *Trends in Amplification*, 12, 170-187

*Ioannis, P., Georgios, K., Alexandra, K., Dimitrios, D., & Michael, T. (2009). Pseudohypacusis: The most frequent etiology of sudden hearing loss in children. *European Archives of Oto-Rhino-Laryngology*, 266, 1857-1861.

*Mcpherson, B., Mcmahon, K., Wilson, W., and Copland, D. (2012). "I know you can hear me": Neural correlates of feigned hearing loss. *Human Brain Mapping*, 33, 1964-1972.

Module 4 Auditory Processing Disorders

April 6 Auditory processing disorders: Auditory neuroscience

Presentation 7 - Madie

Readings:

Katz, Text, Chapters 27-28

*Pluta, A., Wolak, T., Czajka, N., Lewandowska, M., Cieśla, K., Rusiniak, M., Grudzień, D., & Skarżyński, H. (2014). Reduced resting-state brain activity in the default mode network in children with (central) auditory processing disorders. *Behavioral and Brain Functions: BBF*, 10, 33-33.

*Sanes, D., & Constantine-Paton, M. (1985). The sharpening of frequency tuning curves requires patterned activity during development in the mouse, Mus musculus. The *Journal of Neuroscience*, 5(5), 1152-1166.

April 13 Auditory processing disorders: Evaluation
Demonstration of Lab 4 (due April 27)

Presentation 8 - Stephen

Quiz 6

Readings:

Katz, Text, Chapter 29

*Ludwig, A., Fuchs, M., Kruse, E., Uhlig, B., Kotz, S., & Rübsamen, R. (2014). Auditory processing disorders with and without central auditory discrimination deficits. *Journal of the Association for Research in Otolaryngology*, 15(3), 441-464.

April 20 Auditory processing disorders: Differential Diagnosis & Intervention

Quiz 7

Presentation 9 - Eve

Readings:

Katz, Text, Chapter 30

*Sharma, M., Purdy, S. C., & Kelly, A. S. (2009). Comorbidity of auditory processing, language, and reading disorders. *Journal of Speech, Language, and Hearing Research*, 52, 706-722.

*Loo, J. H., Rosen, S., & Bamiou, D. E. (2016). Auditory training effects on the listening skills of children with auditory processing disorder. Ear Hear, 37(1), 38-47.

*Hornickel, J., Zecker, S. G., Bradlow, A. R., & Kraus, N. (2012). Assistive listening devices drive neuroplasticity in children with dyslexia. *Proceedings of the National Academy of Sciences*, 109, 16731-16736.

April 27 Guest Lecturer: Larry Medwetsky, Ph.D., Gallaudet University
The Spoken-Language Processing Model

May 4 Case studies
Review for final

May 11 FINAL EXAMINATION

Grading System

Summary of point system:

Labs: 25 points each	4 labs x 25 pts	= 100
Quizzes: 25 points each	7 quizzes x 25 pts	= 175
Presentations: 25 points each	1 presentation x 25 pts	= 25
Midterm: 100 points	1 exam	= 100
Final: 150 points	1 final	= 150
		550

Learner Outcomes

This course covers advanced clinical and experimental methods for evaluation of the peripheral and central auditory systems, including procedural considerations and interpretation of test results. By the end of the course, students will demonstrate knowledge of:

1. When/how to administer, interpret, and report the results of advanced audiological tests, including advanced immittance measures and otoacoustic emissions testing.
2. Audiometric techniques used in cases of suspected pseudohypacusis.
3. Tinnitus and hyperacusis assessment
4. Assessment and management of auditory processing disorders.
4. The principles and practices of research, including experimental design and application to clinical populations.

Students are also referred to the Formative Assessment Form provided at the back of the syllabus.

PLEASE NOTE: It is the student's responsibility to contact me to obtain my signature on the Formative Assessment Form at the end of the semester when all course work has been completed.

Formative Assessments

1. **Practical Lab Exercises and Reports:** Students will be required to complete practical lab assignments using appropriate assessment tools and to submit a report for each lab. See the course ELMS site for more specific information on these assignments, including due dates.

2. **Article Presentations:** Student will choose one article from the syllabus and will prepare and present powerpoint slides that summarize the article's introduction, method, results (review each figure), and discussion. In addition, students will critique the article, suggest ways to improve the research, and propose a new research question. The presentation should not exceed 15 minutes. A grading rubric will be posted on ELMS.

3. **Online Reading Quizzes:** Students are expected to be familiar with the assigned readings prior to coming to class. Each student will be required to complete 8 quizzes on the course ELMS site that cover lecture content and readings from the textbook and articles. These quizzes are "open-book" in that students have access to the text while taking the quiz. The

students will have one week to complete the quiz. The quizzes are timed – but you will have 4 hours to complete it. Once you've started the quiz, you must finish it – you can't go back to it later.

4. **Exams:** One midterm and final examination will be given. Exam questions will come from class lectures, quizzes, and assigned readings.

Guidelines for Practical Lab Exercises & Reports

The lab exercises are designed to help you put into practice the concepts and procedures we cover in class. Handouts outlining instructions for the test procedures and reports can be obtained on the ELMS site.

Lab Reports

You must follow all guidelines for written work listed in this syllabus. The typed portion of the lab report should be limited to one page or less. Hard copies of all relevant printouts, graphs, tables or other raw data must be handed in by the due date. Although you may consult your textbooks and other resources, including your classmates, as you work on each lab, please make sure your write-up is your own.

Submission of Reports

Lab reports are due at the start of class or in the instructor's mailbox by 1:00 PM on the dates indicated below. Three points will automatically be deducted from your lab grade for every day the report is late. The labs will cover the following topics:

Lab #1: Otoacoustic Emissions	due February 17
Lab #2: Advanced Immittance Measures	due March 23
Lab #3: Nonorganic Hearing Loss	due April 13
Lab #4: Auditory Processing Evaluation	due April 27

Questions/Difficulties

Please contact me as soon as possible if you have difficulties with or questions about a particular lab assignment, so that they can be resolved in plenty of time for you to complete the lab by the due date, and so that you have a better understanding the relevant concepts prior to exams.

University Policies

Academic Integrity

The University administers an Honor Code and an Honor Pledge, available on the web at http://www.bsos.umd.edu/for-students/advising/academic-integrity-honor-pledge-and-legal-aid-.aspx. The Code prohibits students from cheating on exams, plagiarizing papers, submitting the same paper for credit in two courses without authorization, buying papers submitting fraudulent documents, and forging signatures. Students are requested to write the following signed statement on each examination or assignment: "I pledge on my honor that I have not given or received any unauthorized assistance on this examination (or assignment)." Compliance with the code is administered by a Student Honor Council, which strives to promote a "community of trust" on the College Park campus. For additional information, see the Office of Judicial Programs and Student Ethical Development website: http://robeson.rutgers.edu/studentlife/conduct.html.

Accommodations for Students with Disabilities
If you have a documented disability and wish to discuss academic accommodations with me, please contact me before February 8th. If necessary, please contact the Disability Support Service (301-314-7682) for assistance in determining and implementing appropriate academic accommodations.

Confidentiality-Posting Grades
The University complies with the regulations set forth in the Buckley Amendment. The amendment protects the student from the disclosure of personal and academic information to anyone other than the student, including parents, except under special circumstances. Posting student grades with either student names or social security numbers-in whole or in part-*is strictly prohibited.* Grades will be available on ELMS, UMEG, or directly from the instructor.

Religious Observances
The University System of Maryland policy on religious observances provides that students *should not be penalized because of observances of their religious beliefs; students shall be given an opportunity, whenever feasible, to make up within a reasonable time any academic assignment that is missed due to individual participation in religious observances.* I will make every feasible effort to accommodate students' requests based on attendance of religious observances. *It is the student's responsibility to inform* me of any intended absences for religious observances *in advance. Notice should be provided as soon as possible but no later than the end of the schedule adjustment period.* Prior notification is especially important in connection with final examinations, since failure to reschedule a final examination before the conclusion of the final examination period may result in loss of credits during the semester. To review the University's policy or view a variety of other religious holidays, see http://www.bsos.umd.edu/for-faculty-and-staff/faculty-resource-guide/faculty-responsibilities-inside-the-classroom-/canceling-classes.aspx for further details.

Online Course Evaluation, Spring 2016
Your participation in the evaluation of courses through CourseEvalUM is a responsibility you hold as a student member of our academic community. Your feedback is confidential and important to the improvement of teaching and learning at the University. I will ask that you complete the online course evaluation during class on April 20th.

Flu and other illnesses
The University of Maryland is concerned for the health of members of the University community. However, we are also concerned about the possibility that widespread illness could disrupt the academic enterprise of the University. If you have flu-like symptoms, please stay home and seek medical attention. You should return to classes only after your fever and symptoms have abated for 24 hours. I will follow the same policy. To continue the teaching/learning environment of our class even if you or I are absent, and/or classes are canceled, I plan to implement several contingencies this year:

1. I will communicate with all of you via ELMS if class is canceled for any reason;
2. In case of weather emergency, we will have an online class through ELMS;
3. I ask you to communicate with me if you are sick and will miss class;
4. I will post all ppt presentations and recordings to ELMS;

ELMS Course Website/ Course Readings
Students must log on regularly to their Canvas accounts in order to fully participate in this class. Please plan to check the site frequently for announcements. The class site will include the syllabus, the

course reading list, course content, information on and instructions for assignments, and grade postings.

There are a number of readings for the course, including chapters from the text and original journal articles. Students are expected to be familiar with the assigned readings prior to coming to class and to be prepared to discuss the readings during class.

If you have not previously used ELMS, information on ELMS and on how to logon is provided at the following website: under "Student Resources". If you do not have access to a personal computer at home, you can access the Internet and your ELMS page at one of the open workstation laboratories on campus. Information on the location of open workstation laboratories and hours of operation can be found at http://www.oit.umd.edu/wheretogo or by contacting the Office of Information Technology (OIT) Helpdesk (for more information, see http://www.helpdesk.umd.edu).

Make-up Exams/Assignments

If a student is aware ahead of time that he/she will be absent on the day of an exam, the student may schedule a make-up exam provided that (1) the student has an approved University Acceptance (e.g., religious observance) and (2) the instructor is notified in writing within the first two weeks of the semester (by February 10). Assignments are expected to be submitted by the dates indicated on the syllabus or in advance of the due date if the student anticipates being absent from class on the due date. The student should inform the instructor that he/she will be absent ahead of time to make arrangements to submit the assignment.

When the reason for an absence on the day of an exam or assignment is not foreseeable, the student must inform the instructor as soon as possible. Please make every effort to contact the instructor by phone or by email prior to class if you will be absent due to illness or other emergency. Campus Senate policy requires students who are absent due to illness/injury to furnish documentary support to the instructor. You must provide written documentation verifying your illness/injury on the day that you return to class. You will not be allowed to turn in missed assignments or make up exams if you have not provided this documentation. In addition, if it is found that you have falsified the documentation provided, you will be referred to the University's Student Conduct Office.

Make-up exams will be scheduled at a time that is mutually agreeable to both the instructor and the student. Assignments are due immediately by electronic submission if possible or upon the student's return to school. All missed exams and assignments not turned in will result in a grade of zero for that exam/assignment.

Problems/Questions

Please do not hesitate to make an appointment to speak with me if you are having difficulty with the material or with an assignment, if you have questions about how something was graded, or if you have other problems or issues related to the course you wish to discuss. Email is an excellent way to reach me outside of course meetings.

HESP 706

FORMATIVE ASSESSMENTS

Student _____
Semester: SPRING 2016

ASHA Standard **Method of Assessment** (denoted by *)
Verification of Assessment (denoted by ✓)

No.	**Title**	Exam questions	Project	Lab Assignments
B2	Patient characteristics and how they relate to clinical services	*	*	*
B4	Anatomy and physiology, pathophysiology and development of the auditory system	*	*	*
B9	Principles, methods and applications of psychoacoustics	*		*
B12	Infectious/contagious diseases and universal precautions			*
B15	Principles and practices of research, including experimental design, statistical methods, and application to clinical populations		*	
B20	Laws, regulations, policies and management practices relevant to the profession of audiology		*	*
C4	Screen individuals for hearing impairment and disability/handicap using clinically appropriate and culturally sensitive screening measures.	*	*	*
D7	Perform audiologic assessment using physiologic, psychophysical and self-assessment measures	*		*
D8	Perform electrodiagnostic test procedures	*		*
D11	Document evaluation procedures and results			*
D12	Interpret results of the evaluation to establish type and severity of disorder	*	*	*
D13	Generate recommendations and referrals resulting from the evaluation process	*		*
D15	Maintain records in a manner consistent with legal and professional standards			*

Instructor Signature:_____
Samira Anderson, Au.D., Ph.D.