



Course Syllabus

Instrumentation in Hearing and Speech Sciences

HESP 600
Fall 2021

Learning Outcomes

Students will acquire knowledge in foundations of audiology practice. This course will focus on signals and systems with applications to audiology, speech science, and hearing science.

After successfully completing this course you will be able to:

- Analyze simple and complex acoustic and non-acoustic signals
- Describe time and frequency relationships
- Analyze systems and the relationship between input and output signals
- Measure signal characteristics as related to clinical equipment and calibration

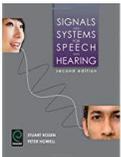
ASHA Certification Standards (KASA)

A13, A14, A24, A25

Required Resources

Course Website: <https://elms.umd.edu/>

Lectures and supplementary material will be uploaded to the course website.



Course Textbook: Signals and Systems for Speech and Hearing (Second Edition)
Stuart Rosen and Peter Howell
ISBN #1848552262

A scientific calculator (capabilities for logarithms, trigonometry, exponents, etc.) will be necessary for this course and should be brought to every class.

A cell phone or laptop should be brought to every class for clicker review questions (clickers.umd.edu).

Matthew Goupell
goupell@umd.edu

Class Meets

Wednesdays
3:30 – 6:00pm
Woods Hall (WDS) 1127

Office Hours

By appointment
to accommodate
clinic schedules

Course Communication

Time-sensitive course
communication will take
place over ELMS
announcements.

Campus Policies

See <http://ugst.umd.edu/courserelatedpolicies.html>.

Topics that are addressed in these various policies include academic integrity, student and instructor conduct, accessibility and accommodations, attendance and excused absences, grades and appeals, and copyright and intellectual property. Please contact the instructor with any questions.

Expectations

Each student is expected to read assigned chapters and papers before each class and complete all assignments on time. Reading the weeks' material again after class is recommended. Class participation is highly encouraged.

Attendance to class is not required in this class; however, it is highly encouraged because it will help you better understand the material and resolve questions.

Please inform me ahead of time by email about excused absences for missing quizzes or exams so that I can try to accommodate your situation. In the extreme circumstance that you cannot inform me that you will miss an exam before it occurs, contact me as soon as you can so that I can try to accommodate your situation.

Students are expected to treat each other with respect. Disruptive behavior of any kind will not be tolerated. Students who are uncivil toward one another or me will be subject to referral to the Office of Student Conduct or to the University Campus Police. You are expected to adhere to the Code of Student Conduct.

Course Assignments

Exercises

Exercises will be assigned during class and should be completed by the start of class the following week. Questions about the past week's exercises will be answered in class and an answer key will be posted on ELMS. You are responsible for checking the accuracy of your answers and asking questions about the exercises that you did not understand.

You are encouraged to attempt the exercises by yourself at first and to seek help from classmates when you get stuck. Working with classmates is excellent preparation for the quizzes, exams, and working with colleagues in this field. I also suggest attempting the exercises again at a later time to see if you can do them. Practice is important for success in this course. If you complete all exercises and submit your exercise set on ELMS before the answer key is posted, you will earn 1% extra credit toward your score on the next exam.

Labs

Two labs (a signals lab and a systems lab) are due this semester. The labs will include questions about activities in class on the three computer lab days (see course schedule) and other related exercises. Further instruction will be given in class regarding these assignments.

Quizzes

Quizzes will take place in class on 9/19 and 11/7. More details will be given in class.

Exams

There are two written exams in this course: a midterm (signals) and a final exam (signals and systems). The final exam is cumulative. Exams will not be provided to students who are more than fifteen minutes late for the start of the exam.

Grading Policy

Final scores will be based on quizzes (20%), labs (25%), midterm (25%), and final (30%).

| Numerical Score | Grade | Numerical Score | Grade | Numerical Score | Grade |
|-----------------|-------|-----------------|-------|-----------------|-------|
| 97-100 | A+ | 80-83 | B- | 64-66 | D |
| 94-96 | A | 77-79 | C+ | 60-63 | D- |
| 90-93 | A- | 74-76 | C | 59 or below | F |
| 87-89 | B+ | 70-73 | C- | | |
| 84-86 | B | 67-69 | D+ | | |

Course Schedule

| Date | Topics | Readings |
|----------|--|-----------------------------------|
| 9/1/21 | <ul style="list-style-type: none"> Overview of course and introduction to signals | Rosen Chapters 1-3 |
| 9/8/21 | <ul style="list-style-type: none"> Sine waves, logs, and scales | Rosen Chapters 1-3 |
| 9/15/21 | <ul style="list-style-type: none"> Complex waves and Fourier transform | Rosen Chapter 7 |
| 9/22/21 | <p>Quiz 1</p> <ul style="list-style-type: none"> Complex waves and Fourier transform | Rosen Chapter 7 |
| 9/29/21 | <ul style="list-style-type: none"> Complex waves and Fourier transform, Digital signal processing | Rosen Chapter 14 |
| 10/6/21 | <ul style="list-style-type: none"> Review <p>Signals Lab 1 Due</p> | |
| 10/13/21 | Midterm Exam | |
| 10/20/21 | <ul style="list-style-type: none"> Introduction to systems | Rosen Chapters 4, 8 |
| 10/27/21 | <ul style="list-style-type: none"> Filtering and windowing, spectrograms | Rosen Chapters 6, 8, 10-11 |
| 11/3/21 | <ul style="list-style-type: none"> Auditory system and speech production | Rosen Chapters 12-13 |
| 11/10/21 | <p>Quiz 2</p> <ul style="list-style-type: none"> Hearing aids, cochlear implants, and sound processing | |
| 11/17/21 | <p>Signals Lab 2 Due</p> <ul style="list-style-type: none"> Electronics and devices, Electricity | Rosen Chapter 10, Elec-Basics.pdf |
| 11/24/21 | Thanksgiving – No Class | |
| 12/1/21 | <ul style="list-style-type: none"> Transducers and calibration | ANSI MPANL update |
| 12/8/21 | <p>Systems Lab due</p> <ul style="list-style-type: none"> Catch up and review | |
| 12/15/21 | Final Exam | |

Other important dates

| | |
|------------------------------------|----------------------------------|
| 9/30, 11/4 | Basic Hearing Measurements Tests |
| 10/12-19, 12/7-17 | Hearing Aids Tests |
| Mon-Wed, Sept. 6-8, 2021 | Rosh Hashanah |
| Sun-Mon, Sept. 15-16, 2021 | Yom Kippur |
| Mon-Wed, Sept. 20-22, 2021 | Sukkot |
| Mon-Wed, Sept. 27-29, 2021 | Simchat Torah |
| Sun-Mon, Nov 28-Dec 6, 2021 | Hanukkah |

Academic Integrity

It is the responsibility of all students to read and understand the misconduct guidelines of the University of Maryland College Park (<http://www.testudo.umd.edu/soc/dishonesty.html>). Any suspicion of academic dishonesty will result in a report filed with the Student Honor Council. Any of the following acts, when committed by a student, shall constitute academic dishonesty:

- CHEATING: intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise.
- FABRICATION: intentional and unauthorized falsification or invention of any information or citation in an academic exercise.
- FACILITATING ACADEMIC DISHONESTY: intentionally or knowingly helping or attempting to help another to violate any provision of this Code.
- PLAGIARISM: intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise.

Special Accommodations

I will make every effort to accommodate students who are registered with the Accessibility and Disability Service (ADS) Office and who provide me with a University of Maryland ADS Accommodation form. Only written ADS documentation of the accommodation will be considered. This form must be presented to me no later than **September 14, 2021**. I am not able to accommodate students who are not registered with ADS or who provide me with documentation which has not been reviewed and approved by the University of Maryland's ADS Office after **September 14, 2021**.

Religious Inclusiveness

It is the policy of the University of Maryland College Park to not schedule exams on religious holidays. If I have accidentally scheduled an exam on a religious holiday that you observe, please let me know no later than **September 14, 2021**. I will reschedule the exam for the entire class to a more appropriate date.

Copyright

Class lectures and other materials are copyrighted and may not be reproduced for anything other than personal use without written permission from the instructor. Lectures, materials, quizzes, and tests may not be sold to other parties.

Campus and Other Emergencies

In the event that the University is closed for an emergency or extended period of time, I will communicate to you via email to indicate schedule adjustments, including rescheduling of examinations and assignments due to inclement weather and campus emergencies. Course requirements, deadlines, and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. Official closures and delays are announced on the campus website <http://www.umd.edu>. The snow phone line is 301-405-SNOW, and local radio and TV stations may also provide closure information.

Dear students,

Important Point #1: As you are well aware, this semester is still not normal. We may be dealing with additional stress and anxiety. I'm writing this to let you know that I am very open to being flexible should life events arise that make it hard for you to keep up with the class. Such events might include things happening to you personally or things happening to family members. Please know that I want to do everything I can to support you. To do this, though, I need to know about a problem when it starts, not after it has already derailed your ability to keep up with class. I don't need to know details. Whatever you are comfortable telling me is fine. Letting me know sooner rather than later, though, is key. I'm in a much better position to help you and make accommodations if you tell me when the problem arises. It is MUCH harder to do this if you wait until the end of the term. You can email me. Upshot: I am here to help. If you are having life issues that are making it hard for you to keep up with class, PLEASE let me know so I can help.

Important Point #2: We have reached a new level of uncertainty of this semester. We will generally follow the advice of the University. For now, we will meet in person and we have returned to standard grading policies and deadlines. We will have a ripcord policy, to go back and change the syllabus as needed given circumstances. Changes won't be made lightly but they may be necessary given some circumstances. We will institute a democratic system and require a >2/3 majority vote on syllabus changes.

LEARNING OBJECTIVES AND OUTCOMES
HESP 600: INSTRUMENTATION

STUDENT NAME:

SEMESTER COMPLETED: Fall 2021

| Number | Title | Exam/quiz Questions | Homework Assignments |
|--------|---|---------------------|----------------------|
| A13 | Instrumentation and bioelectrical hazards. | | |
| A14 | Physical characteristics and measurement of electric and other nonacoustic stimuli | | |
| A24 | The use of instrumentation according to manufacturer's specifications and recommendations | | |
| A25 | Determining whether instrumentation is in calibration according to accepted standards. | | |

Method of assessment denoted by (*).

Verification of assessment denoted by checkmark.

The above-named student has successfully demonstrated mastery of these learning outcomes, through class lectures and discussion, in-class examinations, and homework assignments.

Matthew Goupell, Ph.D.
Faculty instructor

Date: