



Understanding the auditory processing of both the living and the dead will keep you alive in any type of zombie pandemic.

What will you learn in this class?

A deep understanding of the anatomy and physiology of the auditory and vestibular systems are crucial for correct clinical diagnoses (on both living and dead patients).

At the end of this course, the students should be able to:

- Have knowledge of anatomy and physiology, pathophysiology and embryology, and development of the auditory and vestibular systems.
- Have knowledge of normal aspects of auditory physiology and behavior over the lifespan.
- Be able to fit a hearing aid or cochlear implant on a zombie.
- Make clinical recommendations that best serve the undead.
- Keep yourself alive in any type of zombie apocalypse.

Who We Are

About Us

We know it is all a matter of time. So do you. Time to get ready.

Contact Us

Phone: x5-8852
Email: goupell@umd.edu
Office: 0241 Lefrak (LEF) Hall

The best way to contact me is by email. But responses often take more than 24 hours.

My Office Hours:
By appointment. Questions will mostly be answered in class.



ZOMBIE PANDEMIC SURVIVAL GUIDE

*Hearing and Speech Sciences
634: Anatomy and Physiology
of the Auditory and Vestibular
Systems*



ZOMBIE PANDEMIC
SURVIVAL GUIDE



Why study the dead?

Early experiments on the human cochlea in cadavers leads the way

Ever since von Bekesy measured cochlear tuning in human cadavers, it has been highly important to understand how the living and the dead are different in their neural processing of sensory stimuli. Such knowledge will give you the ability to determine whether it is better to hide or run or stand your ground in any given zombie-related emergency. It is well-known that zombies critically rely on their auditory system to find living things to eat. Don't become one of them.

Textbooks

Required Course Textbook:
Musiek and Baran (2018). *The Auditory System: Anatomy, Physiology, and Clinical Correlates*. 2nd Edition
 ISBN-13: 978-1944883003
 ISBN-10: 1944883002
 Note: either edition will be acceptable for class

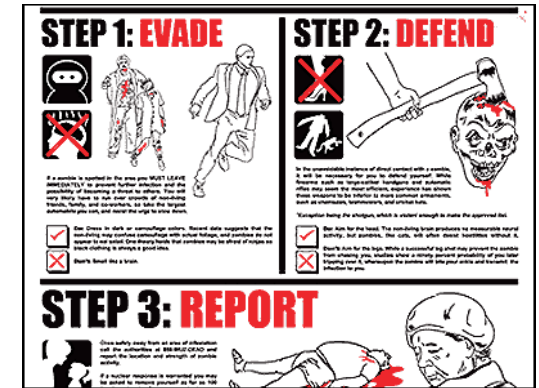
Optional Textbooks:
Verstynen and Voytek (2016). *Do Zombies Dream of Undead Sheep?: A Neuroscientific View of the Zombie Brain*
 A popular presentation of neuroscience, which is much more cortical and less auditory system focused than our other texts.

Pickles (2013). *An Introduction to the Physiology of Hearing*. 4th Edition
 ISBN-13: 978-9004243774
 A generally good textbook, which has more advanced auditory neurophysiology.

Clark and Ohlemiller (2007). *Anatomy and Physiology of Hearing for Audiologists*.
 ISBN-13: 978-1401814441
 Also a generally good textbook, although organized much differently than the class. Still would be a good resource for future audiologists and hearing scientists.

"You walk outside, you risk your life. You take a drink of water, you risk your life. Nowadays you breathe and you risk your life. You don't have a choice. The only thing you can choose is what you're risking it for. We're all infected."

"At the CDC, Jenner told me. Whatever it is, we all carry it."



The CDC and NIH, in a joint collaboration, have made undead hearing a major priority. Don't miss out on funding opportunities, or those that will keep you alive.

If you haven't caught yourself up on the most recent zombie-related materials, feel free to watch:

- The Walking Dead
- 28 Days Later, 28 Weeks Later
- Shawn of the Dead
- Dawn of the Dead
- Evil Dead I and II
- Army of Darkness
- Resident Evil
- Black Sheep
- Etc...

COURSE SCHEDULE

Date	Lecture Number	Topics Covered	Required M&B Chapter(s)	Optional Pickles Reading
June 3, 2020	1	Introduction, Outer Ear, Middle Ear	1-3	2
June 5, 2020	2	Anatomy of the Inner Ear	3, 4	3
June 10, 2020	3	Cochlear Mechanics	5	3
June 12, 2020	4	Intro to Cell Biology, Cochlear Electrophysiology Peripheral Vestibular System, Intro to	6	5
June 17, 2020	5	Neurons	None	None
June 19, 2020	6	Auditory Nerve	7	4
June 24, 2020	7	Auditory Nerve & Cochlear Nucleus	8	6A-B
<i>June 26, 2020</i>		<i>No Class</i>		
July 1, 2020	8	Superior Olivary Complex	9	6C
<i>July 3, 2020</i>		<i>No Class (Holiday)</i>		
July 8, 2020	9	LL, IC, MGB, Thalamus, Cortex	10-13	6D-I, 7
July 10, 2020	10	Efferent System	15	8

Asynchronous Portion of Class

- Given this is a 3 credit class, I expect this portion of class would take **>10 hours per week**. This is a significant amount of time, so I recommend scheduling study/preparation time on your calendar.
- Class Material
 - Our goal is to understand how zombies hear, in case of a zombie pandemic.
 - Anatomy and physiology that is relevant to hearing loss and cochlear implants will also be discussed.
 - Broader (non-auditory) aspects of neuroscience will be covered in order to better understand the important role of hearing in surviving zombie attacks.
- Textbook
 - We will cover approximately two chapters of Musiek and Baran per week (one that will be covered for each in-person class period).
 - Optional texts are also provided for supplementary learning/clarification.
 - I expect you to read the Musiek and Baran **before class** carefully, thoughtfully, and without distraction. This is a skill that graduate students develop and that most undergraduates do not have.
 - Take this part seriously, please.
- Video
 - A number of asynchronous lectures via Panopto will be available for you to watch, ideally before class.
 - Zombie behavior videos will mostly be from YouTube.
- Exercises/Quizzes
 - Online factual quiz questions based on the textbook and the class will be available for you to attempt, ideally before class.
 - They are based on the material in the textbook and Panopto videos.

- Other Preparation
 - Recopying information and notes is important for understanding and consolidation of learning. I expect you to do something like this as preparation for questions for the synchronous portion of class.
 - Posting questions on the discussion board ahead of class time and generating discussions student-to-student and student-to-instructor are highly encouraged and expected. Questions sent via email to Dr. Goupell will be pasted to the discussion board and answered there.

Synchronous Class

- Each class will be about 2 hours. Therefore, the total amount of time you should budget for this class should be >**14 hours/week** given the accelerated summer timeline.
- Class will start with any questions and clarifications from the textbook and Panopto recordings (see above about giving me some forewarning using the discussion boards).
- After the general questions have been answered, we will start the in-class exercise portion, which is also a role-playing/choose-your-own-adventure game.
- People will need to use this website to virtually roll dice:
<http://rolldicewithfriends.com/rooms/zombiehearing>
- This portion will have in-class exercises, designed to be more difficult and relevant to zombie hearing. They are intended to practice critical concepts and provide an opportunity for critical thinking.
- In-class questions will be answered in groups and submitted via ELMS.
- Groups for the in-class exercises will self-select based on the decisions their characters make during the adventure. In-class exercises can be resubmitted once after class.
- It is critical to avoid outside distraction during class
 - Virtual communication environments are prone to distraction, don't become a technology zombie
 - Email and other internet browsing will be turned off
 - All other distracting applications/notices on your computer will be turned off
 - Social media is right out!
 - Turn off or silence your phone
- If necessarily, private communication with the instructor will be done via private message in Zoom because my phone and email will be turned off. In cases where you are having a major technology failure, you can email me.
- A short break about 1 hour into the class will be given.

Attendance:

- Virtual attendance to class is required.
- However, given the situation, I realize that circumstances may interfere with attendance at a given class. These include:
 - Zombie bites and other health-related circumstances
 - Zombie equipment destruction and other technology failures
- Excused absences do not include:
 - Family vacations to tropical locations and similar trips. If you are at the beach, you better make sure there is a good internet connection.
 - Other similar non-zombie-pandemic-related requests.
- Please inform me ahead of time about excused absences for missing class/quizzes/exams due to illness, family emergencies, religious observances, inclement weather, etc. so that I can try to accommodate your situation.
- University policy is to be flexible during the current circumstances, within reason.

Class Participation:

- Class participation is highly encouraged in the form of questions and participating in the game, which require student-to-student and student-to-instructor interaction and cooperation. It is the only way you will survive this class. EXP can and will be deducted for clear cases of non-class compliance.
- Students are expected to treat each other with respect. Disruptive behavior of any kind will not be tolerated. Students who are unable to demonstrate civility with one another, the teaching assistants, 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.

Exercises, Quizzes, and Grading:

- Online quizzes/exercises: Many of the quizzes on ELMS are automatically computer graded. These quizzes can be taken as many times as desired/necessary.
- Signals and Systems Questions: The one exception is that signals and systems questions need to be graded by me.
- Synchronous quizzes/exercises: Will be submitted during class, during the adventure and graded by me outside of class. Students can resubmit these exercises once, ideally after class, given the frantic nature of the synchronous portion of the class. These questions will also need to be graded by me.

Grades (percentage of total EXP available in class, estimated to be around 1000 total EXP)

- Grades in this class are associated with experience points or EXP.
- [Depending on how things go, I leave open the right to rescale the points gain out of class and in class so they are 50% each.]

B+: 90-87	A: >93	A-: 90-92
C+: 80-77	B: 83-86	B-: 80-82
D+: 70-67	C: 73-76	C-: 70-72
F: <60	D: 63-66	D-: 60-62

Gaining Experience Points (EXP)

Grades in this class are associated with experience points or EXP.

Online Quizzes/Exercises (~50% of EXP)

- ELMS Multiple Choice – entered only online, can be taken as many times as you want/need, these are formative assessments
- ELMS Signals and Systems question – usually involves some math and drawing, can be submitted only once

In Class Role-Playing Adventure (~50% of EXP)

- Some of the points are associated with answering questions during the class
- These are intended to be answered during class
- Can be resubmitted once to fix any mistakes that occurred during the heat-of-the-moment learning

All quizzes/exercises are due Sunday after the lectures, which gives you time to ask questions during class.

There will be no final exam or assessment for this class. You are in charge of your own consolidation of learning, which will be critical for success in future classes.

Other actions that award EXP

- Acting in character (+1 EXP)
- Good judgment (+1 EXP)
- Daring or heroic action, whether clever or not (+1 EXP)
- A clever or useful action (+1 EXP)
 - Related to anatomy & physiology of the auditory system (+2 EXP)
- A critical plan that saves character's life and/or a few friends (+2 EXP)
 - Related to anatomy & physiology of the auditory system (+4 EXP)
- A critical plan that saves large group or many people (+4 EXP)
 - Related to anatomy & physiology of the auditory system (+8 EXP)
- Deductive reasoning and/or insight (+2 EXP)
 - Related to anatomy & physiology of the auditory system (+4 EXP)
- Killing or subduing a zombie (+3 EXP)
- Killing or subduing a major menace (+20 EXP)

Penalizing actions that reduce EXP

- Not participating in the game (-5 EXP)
- Not answering questions posed by other students or the instructor (-5 EXP)
- Disrespectful or distracting behavior to other students or the instructor (varies depending on the action, can be up to -50 EXP)
- Clear instances of not paying attention because of email, phones, social media will be documented by the instructor and discussed outside of class (-5 EXP)

University Emergency Closing:

I'm not sure how this is relevant for an online class, but 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. Official closures and delays are announced on the campus website <http://www.umd.edu>. The snow phone line is 301-405-SNOW, as well as local radio and TV stations.

Academic Integrity:

It is the responsibility of all students to read and understand the misconduct guidelines of UM – 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 and Religious Inclusiveness:

I will make every effort to accommodate students who are registered with the Disability Support Service (DSS) Office and who provide me with a University of Maryland DSS Accommodation form. Only written DSS documentation of the accommodation will be considered.

It is the policy of the UM – 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 by the end of the second week of class. I will reschedule the exam for the entire class to a more appropriate date.

Copyright:

Class lectures and other materials have a copyright and may not be reproduced for anything other than personal use without written permission from me. Lectures, materials, quizzes, and tests may not be sold to other parties.

Course Contributions:

- Matthew J. Goupell designed the course and implemented its current form with help from others.
- Season 3 of Walking Dead and Mary Barrett were the original impetus for turning this class into a zombie hearing class.
- Anna Tinnemore was the reason to go far down the zombie neuroscience road.
- The idea for the role-playing game came from the excellent other zombie class on campus by Prof. Chantel Rodríguez. HIST289Y - Why Do We Fear Zombies?: A Cultural History of the Living Dead
- Mary Barrett, Anne Tinnemore, and Paul Mayo were all instrumental in transforming this class to a flipped and virtual classroom, including much help with the assessments.
- Theodore Carter and Mike Thompson consulted on the story and role-playing elements of the course.
- Alanna Schloss made the "Choose Your Own Adventure" cover for the class.
- The role-playing system is based on "Heroes Unlimited" by Palladium Games.

LEARNING OBJECTIVES AND OUTCOMES

HESP 634: ANATOMY AND PHYSIOLOGY OF THE AUDITORY AND VESTIBULAR SYSTEMS

STUDENT NAME:

SEMESTER COMPLETED: Summer 2020

Title	Exam/quiz Questions	Achieved
3.1.2A FOUNDATIONS OF AUDIOLOGY PRACTICE		
Embryology, anatomy, and physiology of the auditory, vestibular, and related body systems	*	
Effects and role of genetics in auditory function, diagnosis, and management of hearing loss	*	
Effects and role of genetics in vestibular function, diagnosis, and management of vestibular disorders	*	
Effects of pathophysiology on the auditory, vestibular, and related body systems	*	
Medical and surgical interventions that may be used to treat the results of pathophysiology in these systems	*	

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.

Date:

Matthew Goupell, Ph.D.

Faculty instructor