

SPLH 462 Principles of Speech Science: Anatomy & Physiology

Spring 2021 Stauffer-Flint 303 11:00 AM – 12:15 PM (M)

Asynchronous online (W)

University of Kansas

Instructor Information

Instructor	Email	Office Location & Hours
<u>Jonathan Brumberg, Ph.D. (he — him)</u> Associate Professor	brumberg@ku.edu	3047 Dole, 4-1061, MW 10–11 AM Zoom & by appt.
<u>Bogi Perelmutter, MA, MSc (they pronouns)</u> Doctoral Student, GTA	bogi-perelmutter@ku.edu	3025 Dole, by appt.

GTA Role

Bogi Perelmutter is the GTA for this course. They will hold discussion and review sessions based on the questions and topics submitted by students. Please direct any questions regarding discussions and reviews to them. Questions on grading can be sent to both Bogi and Dr. Brumberg . Appointments may be scheduled with them via email.

General Information

Description

This course will provide a comprehensive overview of the skeletal, muscular, and neurological mechanisms underlying speech motor control. These systems enable vocal human communication by coordinating respiration, phonation and upper vocal tract movements through nervous system control. Both healthy and disordered speech function will be discussed. Students will be introduced to current topics in speech motor control, kinematics and neuroscience research and associated methodological techniques.

Teaching philosophy

My goal is to provide students the tools and knowledge needed to work logically through a problem without necessarily relying on rote memorization. In scientific study, we are continuously measuring and reporting effects that are due to specific causes. Throughout this course, I challenge you to focus on the effects of the speech anatomy. How do movements of your ribs contribute to respiration? Why do we inhale when the diaphragm lowers and exhale when it is raised? How is it that the vocal folds vibrate? How do the orofacial structures lead to both speech production and safe swallowing? These are all “how” or “why” questions that, if answered, can lead to deeper learning of the biological processes underlying speech, respiration, phonation and swallowing. Finally, my overall goal is for you to apply critical thinking and observation skills from this class to similar problems in the other domains of our field, Hearing and Language.

Expectations

This class is being held in a hybrid format due to COVID-19 policies and procedures; therefore, it is expected that each student use their time outside class to complete all activities and assignments in order to be prepared for our one, in-person / synchronous class period. Students should expect to spend 7–8 hours per week on this class outside of our classroom activities based on general expectations of a 3-credit class. Each student is also responsible for addressing any confusion about the syllabus at the beginning of the semester. The syllabus should be the first resource to answer questions about due dates and course work. Each student is expected to be responsible for turning work in by the due date and there will be no make up opportunities for weekly assignments. The instructor will attempt to follow the schedule below as closely as possible, however changes may occur especially in light of the challenges associated with the ongoing pandemic. Please reach out to me or the GTA with any concerns, especially if you have special considerations related to the pandemic. Our sincerest goal is to provide a safe and supportive learning environment and for you to have achieved our learning objectives by the end of the semester.

Objectives

This course is designed to meet the requirement of ASHA Knowledge Standards (2014) IV-B Normal Processes and IV-C Communication Disorders. After completing this course, students will obtain a basic understanding in:

- The structure (anatomy) and function (physiology) important for respiration, phonation, articulation and swallowing
- The roles of the peripheral and central nervous system in coordinating speech movements
- Distinguishing healthy from disordered speech characteristics in the five categories: respiration, phonation, articulation, swallowing and nervous system.
- By the end of the semester, you will be able to describe all of the motor processes involved in speech production
- By the end of the semester, you will be able to generate hypotheses on movement, speech, and swallowing given initial muscular conditions.

Course Materials

Optional Texts

Hixon, TJ, Weismer, G, Hoit, JD. (2013). **Preclinical Speech Science.** Second Edition. Plural Publishing, Inc., San Diego, CA.

Dimon, T. (2018). **Anatomy of the Voice: An Illustrated Guide for Singers, Vocal Coaches, and Speech Therapists.** North Atlantic Books; III edition.

Blackboard

Blackboard will be used to deliver all pre-class materials to students, including SoftChalk lessons and peer learning activities. You will turn in all assignments to Blackboard and will complete all quizzes and exams online through Blackboard.

Microsoft Teams

Microsoft Teams will be used for communication outside of class time for this course. We will use peer learning groups through Teams to complete peer learning activities, and you will be able to communicate with your group through Teams to share documents. Teams also has features for messaging directly to the instructors as well as to your group and the entire class.

Requirements

Readings

All course material will be available through Blackboard using SoftChalk lessons. Each SoftChalk lesson will describe a topic under discussion each week and will include non-graded mini-quiz questions for you to self-check your knowledge.

Assessments

This course will be based on 10 weekly at-home assignments, 3 Blackboard quizzes, 3 topic exams, 2 labs, an optional, cumulative final exam, and a pre- / post-test assignment.

- **Weekly assignments** Each student will create a study guide covering the assigned reading for the week (5 pts each). Study guides may be formatted however the student chooses. Feedback will be given based on completeness. Study guides will be due to blackboard at 8pm on Sundays (e.g., word document, scanned / photographed notebook pages). There will be no opportunities to make-up weekly assignments for unexcused absences. Weekly assignments will be provided through Blackboard and must represent students own work (i.e. completed individually). The use of a university-supported browser is recommended for all Blackboard assignments.
- **Pre-/post-test assignment** requires students to synthesize their knowledge about each of the subsystems of speech (respiration, phonation and articulation) for describing all of the processes involved in producing the word “Kansas” in different every-day contexts. Completion of the pre- / post-test assignment will earn you 5 points each.
- **Quizzes** will assess student knowledge of key concepts using a mixture of objective (multiple-choice, matching, true/false) and short-answer questions and administered online on Blackboard. Each quiz is worth 20 points and will be announced at least one week in advance (e.g., a quiz on a Wednesday will be announced the previous Wednesday) and must be completed in 35 minutes.

- **Labs** will provide students with experiences representative of the biophysiological measurements related to the course topics, including respiration and articulation, as well as introductory basic analysis. Each lab will be worth 20 points.
- **Exams** will be administered online through Blackboard and are open note. You will have 75 minutes to complete the exam once you have started it (e.g., if you start it, then close your browser for 15 minutes, you will only have 60 minutes remaining). There will be three topic exams for each of the main areas: respiration, phonation and orofacial (articulation / swallowing). Each exam is worth 100 points will consist of questions in short-answer and objective format (multiple-choice, true/false, matching).
 - **An optional final exam** will be given on Monday, May 12, 2021 from 10:30 AM–1:00 PM. The cumulative final exam will also be worth 100 points and will consist of questions in short-answer and objective format. If taken, the optional final exam may be used to replace one of your other exam grades. For instance, if you earn a higher score on the final exam than on one of the three topic exams, the final exam will replace your previous lower exam score. This exam is optional, and is not required if you are satisfied with your prior exam scores.

Optional learning experiences

- **Weekly post-reading assignments** are available on Blackboard, and are designed to help introduce and / or identify key concepts from the readings and lectures as well as prepare students for lecture discussions. Students should attempt to complete each assignment without referring to the course book or lecture notes, then verify responses before submitting their responses.
- **Discussion sessions:** 3 discussion sessions will be held by the GTA throughout the semester. They will fall in the middle of each exam content section and address the content covered up to that point. Students should submit questions/topics to cover via blackboard discussion post by the evening before the day of the discussion. If a student is unable to attend the scheduled discussion time, they may email the GTA and schedule a meeting to discuss their questions.
- **Exam reviews:** Exam reviews will be held by the GTA prior to each scheduled exam. Students should submit questions/topics to cover via blackboard discussion post by the evening before the day of the review. If a student is unable to attend the scheduled review time, they may email the GTA and schedule a meeting to discuss their questions.

Grading

The University has prescribed definitions for grades and the University Senate Rules and Regulations define grades in the following way <http://policy.ku.edu/governance/USRR#art2sect2para3>:

- 2.2.1.1 The grade of A will be reported for achievement of outstanding quality
- 2.2.1.2 The grade of B will be reported for achievement of high quality
- 2.2.1.3 The grade of C will be reported for achievement of acceptable quality
- 2.2.1.4 The grade of D will be reported for achievement that is minimally passing, but at less than acceptable quality
- 2.2.2 The letters, F, U (unsatisfactory), and NC (no credit) shall indicate that the quality of work was such that, to obtain credit, the student must repeat the regular work of the course.

Reading assignments are worth 5 points each (10 assignments x 5 points = 50 points total)

Pre-/post-test assignment are worth 5 points each (5 + 5 = 10 points total)

Quizzes are worth 20 points each (3 quizzes x 20 points = 60 points total)

Labs are worth 20 points each (2 labs x 20 points = 40 points total)

Exams are worth 100 points (3 exams x 100 points = 300 points total)

Final grade is out of 460 points

Plus / minus grading will be used according to the following:

Letter Grade	Percentage Range	Quality of Achievement
A	92.5 – 100%	Outstanding
A-	90.0 – 92.5%	High
B+	87.5 – 90.0%	
B	82.5 – 87.5%	
B-	80.0 – 82.5%	
C+	77.5 – 80.0%	Acceptable
C	72.5 – 77.5%	
C-	70.0 – 72.5%	
D+	67.5 – 70.0%	Minimal
D	62.5 – 67.5%	
D-	60.0 – 62.5%	
F	below 60.0	Inadequate

Course Schedule (subject to change)

Speech Science: Subsystems & Levels of Observation		
02/01	<u>In Class</u> Syllabus & Course Overview Introduction to Speech Science <u>Post-Class</u> SoftChalk: Introduction to Speech Science	Post your course goals: Due 02/05 8pm “Kansas” pretest assignment: Due 02/05 8pm
Topic 1: Respiration		
Respiration Module 1: Skeletal Structure, Pulmonary Apparatus & Musculature		
02/08	<u>Pre-Class</u> SoftChalk: Skeleton & Pulmonary Apparatus SoftChalk: Chestwall Muscles - Diaphragm, Ribs, Abdomen Activities 1 & 2 Voice Thread - Activity 1 <u>In Class</u> Review Activity 2	Study Guide 1: Due 02/07 8pm
Respiration Module 2: Kinematics, Forces, Pleura & Linkages		
02/15	<u>Pre-Class</u> SoftChalk: Respiration Kinematics SoftChalk: Forces, Pleura & Linkages Activity 3 <u>In Class</u> Lung Model Activity Review Activity 3	Study Guide 2: Due 02/14 8pm Quiz #1: Due 02/17 8pm
Respiration Module 3: Neural Control, Measurement & Speech Breathing		
02/22	<u>Pre-Class</u> SoftChalk: Neural Control of Breathing SoftChalk: Measurement SoftChalk: Speech Breathing Activity 4 <u>In Class</u> Review Activity 4	Study Guide 3: Due 02/21
03/01	<u>Pre-Class</u> Complete Lab 1 <u>In Class</u> Review Lab 1 & exam prep	Lab 1: Due 02/28 8pm Exam 1: Due Due 03/05 by 11:59pm
Topic 2: Larynx & Phonation		
Larynx Module 1: Laryngeal Structure		
03/08	<u>Pre-Class</u> SoftChalk: Larynx Structure Activities 5 & 6 <u>In Class</u>	Study Guide 4: Due 03/07

Review Activities 5 & 6

Larynx Module 2: Laryngeal Muscles		
03/15	Pre-Class SoftChalk: Laryngeal Muscles Activity 7 In Class Review Activity 7	Study Guide 5: Due 03/14
Larynx Module 3: Laryngeal Airflow & Pathology		
03/22	Pre-Class SoftChalk: Laryngeal Airflow & Pathology Activity 8 In Class Review Activity 8	Study Guide 6: Due 03/21 Quiz #2: Due 03/24 8pm
Larynx Module 4: Vibrating Larynx		
03/29	Pre-Class Video: The Vibrating Larynx Activity 9 In Class Review Activity 9 Review for Exam	Study Guide 7: Due 03/28 Vibrating Larynx Extra Credit Due 03/28 (up to 0.5 pts EC per question) Exam 2: Due 04/02 11:59pm
Topic 3: Orofacial, Pharyngeal & Swallowing		
Orofacial Module 1: Velopharynx/Oropharynx		
04/05	Pre-Class SoftChalk: Velopharynx SoftChalk: Oropharynx Activities: 10 & 11 In Class Review Activities 10 & 11	Study Guide 8: Due 04/04
Orofacial Module 2: Tongue Muscles		
04/12	Pre-Class SoftChalk: Tongue Muscles Activity 12 In Class Review Activity 12	Study Guide 9: Due 04/11
Orofacial Module 3: Articulation & Swallowing		
04/19	Pre-Class SoftChalk: Articulation Activity 13 In Class Review Activity 13	Quiz 3: Due 04/21 8pm
04/26	Pre-Class Complete Lab 2 SoftChalk: Swallowing Activity 14 In Class Review Lab 2 Review Activity 14	Study Guide 10: Due 04/25 Lab 2: Due 04/25 8pm
05/03	Flex / Review for Exam 3	"Kansas" Post-test assignment: Due 05/02 Exam 3: Due 05/05 by 11:59pm
05/12	Optional Final Exam: 05/12 - 10:30am-1pm	

Exam Schedule

Date	Subject
03/05/2021	Exam 1: Breathing
04/02/2021	Exam 2: Larynx / Phonation
05/04/2021	Exam 3: Orofacial / articulation / swallowing
05/12/2021	Final Exam: Cumulative @ 10:30 AM

Additional Information and Resources

Accommodations

<http://access.ku.edu/syllabus-statement-0>

The Academic Achievement and Access Center (AAAC) coordinates academic accommodations and services for all eligible KU students with disabilities. If you have a disability for which you wish to request accommodations and have not contacted the AAAC, please do so as soon as possible. They are located in 22 Strong Hall and can be reached at 785-864-4064 (V/TTY). Information about their services can be found at <http://www.disability.ku.edu>. Please contact me privately in regard to your needs in this course within one week of receiving this syllabus so that appropriate accommodations for this course can be discussed.

Religious Observances

<http://policy.ku.edu/governance/USRR#art1sect4>

Should the examination schedule for this course conflict with your mandated religious observance, please contact me at the beginning of the semester so that we can schedule a make-up exam at a mutually acceptable time. In addition, students will not be penalized for absence from regularly scheduled class activities that conflict with mandated religious observances. Students are responsible for initiating discussion with the instructor to reach a mutually acceptable solution.

Diversity, Equity, and Inclusion

The Department of Speech-Language-Hearing endorses and adheres to the College's statement on diversity, equity, and inclusion. Cultural and linguistic diversity are central to the field of speech-language-hearing and an integral part of clinical practice as an audiologist or speech-language pathologist. As a department, we strive to create an environment where differences are valued and respected, and all people have an equitable opportunity for success. We believe that all students benefit from training and experiences that will help them to learn, lead, and serve in an increasingly diverse society. Consequently, we are committed to enhancing the training we provide around cultural and linguistic diversity.

All members of our campus community must accept the responsibility to demonstrate civility and respect for the dignity of others. Expressions or actions that disparage a person's or group's race, ethnicity, nationality, culture, gender, gender identity / expression, religion, sexual orientation, age, veteran status, or disability are contrary to the mission of the University. We expect that KU students, faculty, and staff will promote an atmosphere of respect for all members of our KU community. This is an inclusive classroom. At KU, administrators, faculty, and staff are committed to the creation and maintenance of "inclusive learning" spaces. These are classrooms, labs, and other places of learning where you will be treated with respect and dignity and where all individuals are provided equitable opportunity to participate, contribute, and succeed.

Civility and Respect

Civility and respect for the opinions of others are very important in an academic environment. It is likely you may not agree with everything that is said or discussed in the classroom. Courteous behavior and responses are expected at all times. When you disagree with someone, be sure that you make a distinction between criticizing an idea and criticizing the person. Expressions or actions that disparage a persons or race, ethnicity, nationality, culture, gender, gender identity / expression, religion, sexual orientation, age, disability, or marital, parental, or veteran status are contrary to the mission of this course and will not be tolerated.

Medical Crisis

<http://policy.ku.edu/governance/USRR#art1sect4>

Students with a verifiable medical crisis of a relative or friend may be excused from being present for scheduled examinations and tests. It is the responsibility of the student to initiate discussion with the instructor, prior to the examination/test if possible or as soon as possible after the event. The instructor and student shall come to a mutually agreeable method of making up the missed work.

Although the university policy on medical crisis only applies to friends or relatives of a student, I apply this policy to the students in my course. If you have a verifiable medical or personal crisis, please let me know as soon as possible so that we can work together to establish a schedule for making up missed work.

Academic Misconduct

Students are expected to observe all University guidelines pertaining to academic misconduct. As stated in the University Senate Rules and Regulations (2.6.1) <http://policy.ku.edu/governance/USRR#art2sect6>:

“Academic misconduct by a student shall include, but not be limited to, disruption of classes; threatening an instructor or fellow student in an academic setting; giving or receiving of unauthorized aid on examinations or in the preparation of notebooks, themes, reports or other assignments; knowingly misrepresenting the source of any academic work; unauthorized changing of grades; unauthorized use of University approvals or forging of signatures; falsification of research results; plagiarizing of another’s work; violation of regulations or ethical codes for treatment of human and animal subjects; or otherwise acting dishonestly in research.” Academic misconduct will not be tolerated and will be dealt with in accordance with all University rules and regulations.

In this class, students will work in groups to complete lab assignments. Groups are responsible for submitting just one lab report for the entire group, but each group’s work should be independent from other groups, both in the current class and former classes. Submitting lab reports that are exactly the same as, or highly similar to another group or former group is considered academic misconduct. Similarity between group lab reports will be monitored using Safe Assign in Blackboard. In addition, quizzes are expected to be completed individually and independently on Blackboard without assistance from other class members.

Intellectual policy

<http://policy.ku.edu/provost/intellectual-property-policy>

Course materials prepared by the instructor, together with the content of all lectures and review sessions presented by the instructor are the property of the instructor. Video and audio recording of lectures and review sessions without the consent of the instructor is prohibited. On request, the instructor may grant permission for students to audio or video record lectures, on the condition that these recordings are only used as a study aid by the individual making the recording. Unless explicit permission is obtained from the instructor, recordings of lectures and review sessions may not be modified and must not be transferred or transmitted to any other person, whether or not that individual is enrolled in the course.

Commercial Note-Taking Ventures

Pursuant to the University of Kansas’ Policy on Commercial Note-Taking Ventures (<http://policy.ku.edu/provost/commercial-note-taking>), commercial note-taking is not permitted in this course. Lecture notes and course materials may be taken for personal use, for the purpose of mastering the course material, and may not be sold to any person or entity in any form. Any student engaged in or contributing to the commercial exchange of notes or course materials will be subject to discipline, including academic misconduct charges, in accordance with University policy. Please note: note-taking provided by a student volunteer for a student with a disability, as a reasonable accommodation under the ADA, is not the same as commercial note-taking and is not covered under this policy.

Concealed Carry

Individuals who choose to carry concealed handguns are solely responsible to do so in a safe and secure manner in strict conformity with state and federal laws and KU weapons policy. Safety measures outlined in the KU weapons policy specify that a concealed handgun:

- Must be under the constant control of the carrier.
- Must be out of view, concealed either on the body of the carrier, or backpack, purse, or bag that remains under the carrier’s custody and control.
- Must be in a holster that covers the trigger area and secures any external hammer in an un-cocked position
- Must have the safety on, and have no round in the chamber.

Tests and Quizzes

Instructors are allowed by Kansas Board of Regents policy, to require backpacks, purses and other bags be placed at the front or back of classroom during exams and quizzes, and as such those items will not be under the constant control of the individual. Students who choose to carry a concealed handgun in a purse, backpack, or bag must review and plan each day accordingly, and are responsible for making alternate arrangements as necessary. The university does not provide appropriate secured storage for concealed handguns.

Individuals who violate the KU weapons policy may be asked to leave campus with the weapon and may face disciplinary action under the appropriate university code of conduct.

Field Trips A (unattended backpacks)

The lab activities in this course take place on campus and will require students to leave belongings such as backpacks and purses away and unattended for prolonged periods. Students who choose to carry a concealed handgun in a purse, backpack, or bag must review and plan each day accordingly, and are responsible for making alternate arrangements as necessary. Lab activities may also include physical movement that may reveal the presence of a concealed handgun. Plan accordingly prior to beginning this activity. The university does not provide appropriate secured storage for handguns.

Individuals who violate the KU weapons policy may face disciplinary action under the appropriate university code of conduct, including dismissal from the course.

Resources

Blackboard

Blackboard will be used extensively in this course for announcements, lecture note archives and assignment administration. Students should check the course site frequently for any announcements, additional course documents and lecture notes. In addition, all email from instructors to students will be sent through Blackboard. Please be sure to check the email account associated with your Blackboard account. See the instructor if you have any questions.

Academic Achievement and Access Center

The Academic Achievement and Access Center (AAAC) offers many services and programs to assist students in their academic success and to enhance their collegiate experience at KU. Choose from learning strategy consultations, group workshops or general or course-specific academic assistance, by appointment or on a walk-in basis. SPLH students are highly encouraged to take advantage of these services to support their learning in this class (and others). AAAC Services include:

Individual consultations: for help with any aspect of success (time management, study skills, etc) <https://achievement.drupal.ku.edu/consultations>

Tutoring for *any* class: <http://tutoring.drupal.ku.edu/> (Request or sign up during first 4-6 weeks of class)

List of classes with existing supplemental instruction:
<https://achievement.drupal.ku.edu/supplemental-instruction>

Academic success guides for many topics: time management, stress management, test taking, study tips, semester planning <http://achievement.ku.edu/success-guide>

Student Access Services for anyone needing accommodations: <http://access.ku.edu/>

University Career Center

The University Career Center (UCC) offers a wide range of quality services designed to support and challenge students at all points on the career development and implementation path.

University Career Center services include (<http://career.ku.edu>): Work individually with someone from the career center on your resume, CV, cover letter, graduate school essay, internships, job search. Go to <http://career.ku.edu/appointments> to request an appointment.

The UCC can also help you:

1. Determine the right career through career assessments. Visit <http://career.ku.edu/assessments>.
2. Explore different major and career options. Visit <http://career.ku.edu/careersandmajors>.
3. Think about what experiences you can gain now to make you more employable later and more competitive for graduate school. Visit <http://career.ku.edu/cap>.
4. Find internships. Visit <http://career.ku.edu/internships>.
5. Find part-time jobs. Visit <http://career.ku.edu/ptjobs>. But also visit <https://sjobs.brassring.com/TGWebHost/home.aspx?partnerid=25752&siteid=5542> for on-campus part-time student jobs.

Finally, the UCC offers a number of career courses. Visit <http://career.ku.edu/courses> to learn more.

Counseling and Psychological Services

CAPS Personal Counseling Services can help students with issues related to adjusting to college and other psychological, interpersonal, and family problems. Individual and group sessions are available. Self-help resources also are available.

You can make an appointment by calling 785-864-CAPS. See <http://caps.ku.edu/appointments> for more information. The first visit usually lasts about 50 minutes. It is focused on understanding the nature of the concern and clarifying goals and expectations. Usually by the end of the first session an agreement is reached regarding the next steps to take. Most sessions cost \$15. In addition, you can visit the CAPS Self-Help Library at <http://caps.ku.edu/self-help-library> for info on many topics.

In addition, please contact your SPLH mentor (Becky Harris can provide contact information) if you are experiencing health or personal issues that are affecting your academic success. Your mentor can help you identify appropriate campus resources and also can help you make adjustments to your schedule (if needed).

Experiential Learning Certificates

Experiential Learning Certificates offer you a way to take ownership of your education and recognition for your learning both inside and outside of the classroom. All certificates require a combination of coursework, real-world experiences, and reflection. After you have completed a certificate, this accomplishment will be notated on your official KU academic transcript. All certificates are open to undergraduate students at KU from any major! They are great additions to your professional credentials that highlight your learning and experiences outside of the classroom.

Visit <https://experience.ku.edu/experiential-learning-certificates> to learn about the following certificates (*certificates are particularly relevant to SPLH majors and careers).

- *REP - Research Experience Program
- *CSL - Certificate for Service Learning
- *GAP - Global Awareness Program
- *LEAD - Leadership Engagement Certificate
- ARTS - Arts Engagement Certificate
- ENTR - Entrepreneurship Certificate
- SUSTAIN - Sustainability Certificate

See also <http://splh.ku.edu/academics/degrees/ba/opportunities> for additional information about opportunities for learning outside the classroom.