

# SPLH 462 Principles of Speech Science: Anatomy & Physiology

Fall 2018 Dole 2094 3:00 PM – 4:15 PM (MW)

University of Kansas

## Instructor Information

Instructor	Email	Office Location & Hours
<u>Jonathan Brumberg, Ph.D.</u> Assistant Professor	brumberg@ku.edu	3047 Dole, 4-1061, MW 9–10 AM & by appt.
<u>Grace McCarthy</u> Audiology Student, GTA	a143m934@ku.edu@ku.edu	3025 Dole, by appt.
<u>Corinne Walker, M.A.</u> Ph.D. Student, Directed Teaching	cwalker7@kumc.ed	

## 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.

### 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

## Course Materials

### Recommended Text

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

# Requirements

## Assessments

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

- **Weekly post-reading assignments** are worth five points each, and are designed to help introduce and / or identify key concepts from the readings and lectures as well as prepare students for lecture discussions. Assignments will be available by 10 AM on Monday and are due by the following Sunday at 8 PM. Students should attempt to complete each assignment without referring to the course book or lecture notes, then verify responses before submitting their responses. 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 (Firefox) 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 hands-on experience collecting biophysiological measurements related to the course topics, including respiration and articulation. Each lab will be worth 20 points.
- **Exams** will be administered in class and will be completed in in a single class period. 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 Tuesday, December 11, 2018 from 1:30 PM–4:00 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.

## 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:

<b>Letter Grade</b>	<b>Percentage Range</b>	<b>Quality of Achievement</b>
A	92.5 – 100%	Outstanding
A-	90.0 – 92.5%	
B+	87.5 – 90.0%	High
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)

### Introduction

<b>Date</b>	<b>Topic</b>	<b>Lecture</b>	<b>Assignments</b>
<b>Week 1</b> 8/20– 22	Syllabus & course intro, Speech Science: subsystems & levels of observation	Syllabus, Learning Module Week 1	Journal entry: course goals, Pre-test

## Topic 1: Breathing - respiration, chestwall and breathing apparatus

Date	Topic	Lecture	Assignments
Week 2 8/27- 29	Respiration, skeletal structure pulmonary apparatus 01_skeletal_structure.pptx, 02_resp_pulmonary_app.pptx	Learning Module Week 2	Assignment #1: Due 8/26 by 8pm
Week 3 9/5	Diaphragm, rib & ab muscles 03_diaphragm_ribcage.pptx, 04_ab_muscles.pptx	Learning Module Week 3	Assignment #2: Due 9/2 by 8pm
Week 4 9/10- 12	Kinematics, forces, pleura 06_respiration_movements.pptx, 07_chestwall_kin.pptx, 08_forces_pleura.pptx	Learning Module Week 4	Assignment #3: Due 9/9 by 8pm; <b>Quiz #1 Due 9/13 by 8pm;</b>
Week 5 9/17- 19	Neural control of breathing; Measurement variables, speech breathing 09_neural_control.pptx, 10_measurement_vars.pptx, 11_speech_breathing.pptx	Learning Module Week 5	Assignment #4: Due 9/16 by 8pm
<b>Lab 1 This week</b>			
Week 6 9/24	<b>Exam 1: Breathing</b>		

## Topic 2: Larynx, phonation

Date	Topic	Lecture	Assignments
Week 6 9/26	Laryngeal structure	Learning Module Week 7	
Week 7 10/1- 3	Laryngeal musculature	Learning Module Week 8	Assignment #5 Due 9/30 by 8pm; <b>Quiz #2 Due 10/4 by 8pm</b>
Week 8 10/8- 10	Laryngeal & vocal fold movements; Airflow & fundamental frequency	Learning Module Week 9	Assignment #6 Due 10/7 by 8pm
Week 9 10/17	Larynx pathology	Learning Module Week 11	Assignment #7 Due 10/14 by 8pm
Week 10 10/22	<b>Exam 2: Larynx</b>		

## Topic 3: Orofacial, pharyngeal, swallowing

Date	Topic	Lecture	Assignments
Week 11 10/24	Velopharynx structure & musculature	Learning Module Week 12	
Week 12 10/29–31	Oropharynx structure & musculature	Learning Module Week 13	Assignment #8 Due 10/28 by 8pm; <b>Quiz #3: Due 11/1 by 8pm</b>
Week 13 11/5–7	Articulation: tongue muscles	Learning Module Week 14	Assignment #9 Due 11/4 by 8pm
<b>Lab 2: Orofacial EMG this week</b>			
Week 14 11/12–14	Acoustics & articulatory phonetics	Learning Module Week 15	Assignment #10 Due 11/11 by 8pm
Week 15 11/19	Articulation continued		
11/21		Thanksgiving: No class	
Week 16 11/26–28	Articulation & Swallowing	Learning Module Week 16	post-test Due 11/25 by 8pm
Week 17 12/3		<b>Examharyngeal, swallowing</b>	
12/5	Final Exam Review		

## Exam Schedule

Date	Subject
09/24/2018	Exam 1: Breathing
10/22/2018	Exam 2: Larynx / Phonation
12/03/2018	Exam 3: Orofacial / articulation / swallowing
12/11/2018	Final Exam: Cumulative @ 1:30 PM

## 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.

## **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.

### MySuccess

<http://blackboard.ku.edu/mysuccess-instructors> This course participates in MySuccess, an early warning initiative at the University of Kansas to increase student retention Throughout the academic term, you will receive a message from MySuccess through your official KU email address. MySuccess operates through Blackboard. Your instructor may communicate about your course performance by triggering a flag to indicate a low test or assignment score or a “kudos” for above average or improved performance. You may set up additional preferences and features by going to your profile tab.

MySuccess has additional features to help you be a successful student at KU. There is a Success Network that lists a directory of KU resources as well as an online appointment scheduler system that allows you to make appointments with your instructor or assigned academic advisor that have activated their calendars to work with MySuccess. For more information about MySuccess, please visit [www.mysuccess.ku.edu](http://www.mysuccess.ku.edu) and click on the Students tab.

## 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.