



McGill

Faculty of
Medicine and
Health Sciences

School of
Communication Sciences
and Disorders

Year **1** Fall **2023**

SCSD 631 – Speech Science

Number of credits: 2 credits

Course Time: Wednesday **9am – 12pm** starting Sept 27

Location: SCSD Room **862**

Instructor: Dr. Meghan Clayards

Office: **SCSD, Room 819**; Phone: NA

Office Hours: Wednesdays 12-1pm or by appointment

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COURSE DESCRIPTION/OVERVIEW:

This course will provide the scientific bases of speech communication. The objective is to build a basic understanding of speech acoustics, speech production and speech perception that can be applied to understand speech processes in normal and disordered populations as well as providing practical skills for the analysis of speech in a clinical setting.

Instructor Message Regarding the Course

- To help you learn key concepts, you can expect to work on hands-on activities in groups every class. I hope that you approach these activities with a spirit of curiosity and exploration.
- To balance workload and give you flexibility, I try to spread out assessments, give 1 week to complete quizzes and 2 weeks for assignments. If any due date conflicts with significant course work from another course, please raise the issue with me.
- To facilitate different styles of learning I will share my slides with you before each class. Please consider these to be the intellectual property of the instructor and do not share or post them online. These slides are not intended to be a substitute for careful note taking.
- Everyone in the class comes with different background knowledge so I try to build up from the basics. If you are feeling anxious about your background knowledge, I encourage you to sit with others who are feeling more comfortable. The textbook is also a great resource and I encourage you to come talk to me.
- Communicate any [strategies](#) you will use to support equity and inclusion (including pedagogical methods and content)
- Promote student success: post links in myCourses to [Learning Resources](#).
- Encourage students to let you know if they are feeling overloaded with work so that you and them can together address their concerns.]

LEARNING OBJECTIVES/OUTCOMES (COMPETENCIES):

UNIT ONE: Basic Requirements (Audiology and Speech-Language Pathology)

The audiologist and speech-language pathologist demonstrate basic knowledge of:

1.1 Anatomy and Physiology

1.1.ii Articulatory, phonatory, resonatory, and swallowing systems (larynx, pharynx, mouth, and nose).

1.5 Psycholinguistics and Linguistics

1.5.ii Methods of observation and analysis useful in the description of communicative behaviour in the following areas: phonetics and phonology, morphology and syntax, semantics, pragmatics, nonverbal communication, and sociolinguistics.

1.6 Speech Perception and Acoustics

1.6.i The nature and theories of perceptual processes and their development with an emphasis on speech perception, and perception of non-linguistic aspects of communication (e.g., nonverbal affect cues, music, and environmental sounds).

1.6.ii The physics of sound.

1.6.iii Psychophysical methods.

1.6.iv Psychoacoustics.

1.7 Instrumentation

1.7.i Instrumentation relevant to clinical practice and its operation (e.g., amplification and assistive devices, audiometers, audio and video recorders, voice and speech synthesizers and analyzers, hearing aid analyzers, real-ear measurement systems).

UNIT TWO: Knowledge Expert

The speech-language pathologist demonstrates knowledge of:

2.2 Motor Speech Disorders

2.2.iii Characteristics of motor speech disorders including the respiratory, phonatory, resonatory, articulatory, and prosodic features.

2.2.vi The effect of motor speech disorders on speech intelligibility, as well as the psychosocial, educational and vocational impact.

2.5 Voice and its Disorders

2.5.ii Normative data for each dimension of voice production and laryngeal airway across the lifespan (e.g., loudness, pitch, fundamental frequency, resonance, quality) and their application to clinical practice.

2.5.v Factors and processes that may impact voice production (e.g., expression of gender identity, removal of larynx, hearing loss, neuromuscular involvement, musculoskeletal tension, vocal fold pathology, systemic conditions, affective states, environmental factors).

2.6 Resonance Disorders

2.6.i Anatomy and physiology of the velopharyngeal sphincter and resonating cavities (pharynx, oral cavity, nasal cavity) and application of this knowledge to clinical practice.

2.6.ii The perceptual characteristics of normal versus abnormal resonance including hypernasality, hyponasality, cul-de-sac or mixed resonance, in addition to knowledge of the other perceptual characteristics of velopharyngeal dysfunction (e.g., audible/ turbulent nasal air emission, compensatory misarticulation, reduced intraoral pressure, dysphonia).

2.6.vii The impact of velopharyngeal dysfunction and other resonance disorders on other speech subsystems (e.g., respiratory, laryngeal, articulatory).

2.10 Hearing Disorders and Related Speech-Language Disorders

2.10.vi Acoustics of speech and its role in speech perception and communication.

UNIT THREE: Clinical Expert - Cross-Cutting Assessment and Intervention Standards

The speech-language pathologist demonstrates the ability to:

3.3 Analyze and interpret assessment results:

3.3.i Analyze formal, informal, **quantitative**, and qualitative assessment results, including accurate scoring and interpretation of standardized tests.

UNIT FOUR: Clinical Expert - Disorder-Specific Assessment and Intervention Standards

The speech-language pathologist demonstrates the ability to:

4.2 Motor Speech Disorders

4.2.ii Assess phonation, resonance, articulation, and prosody using perceptual and acoustic measures

4.2.iii Assess speech intelligibility and factors that influence it

4.5 Voice and its Disorders

4.5.i Assess voice production and laryngeal airway using appropriate perceptual, physiologic, aerodynamic, and acoustic measures.

4.6 Resonance Disorders

4.6.i Assess velopharyngeal and resonance function, and impact on speech characteristics, using perceptual, acoustic, and articulatory measures.

INSTRUCTIONAL METHODS:

- This class will include lectures, class discussion and hands-on, classroom and lab-based activities. Assessment methods include assignments, quizzes and an exam.
- Students will need to download and install Praat on their computers to complete assignments and to do in class activities.
- Anatomy modules and quizzes will be asynchronous

Expectations for Student Participation

- You are expected to be present in class and to give the class your full attention.
- Use of phones in class for texting or any other purpose other than live polling is not allowed.
- You may use a laptop for note taking, for participating in hands-on activities, or for live polling. Other uses of the laptop are not permitted in class unless explicitly directed by the instructor.

Availability of Class Materials

- Lecture slides will be provided before class through myCourses.
- All instructor generated content provided through myCourses is the intellectual property of the instructor and is not to be shared with anyone outside of the class. It is everyone's responsibility to make sure that any recorded videos or other material do not end up in the public domain.

REQUIRED COURSE MATERIALS

- Carole T. Ferrand. 2013. *Speech Science: An integrated approach to theory and clinical practice (Third Edition)*. Allyn and Bacon. **OR**
- Carole T. Ferrand. 2017. *Speech Science: An integrated approach to theory and clinical practice (Fourth Edition)*. Allyn and Bacon.
- other readings available on myCourses website
- Software: Praat (for any operating system) download from <http://www.fon.hum.uva.nl/praat/>

COURSE CONTENT

All readings are from the 4th edition of the textbook. Sections have been reordered since the 3rd edition.

Week	Date	Description	Readings	Anatomy Modules due	Assignments Due
1	Sept 27	basic acoustics, visualization, resonance, source-filter theory	Ch 1		
2	Oct 4	vowel articulation, formants	Ch 6, 223-237 Johnson p137-141	Module #2 Extrinsic Muscles of the larynx (27min+quiz)	
--	Oct 11	NO CLASS Fall break			Quiz 1
3	Oct 18	disorders affecting vowel articulation	Ch 7: 260-276	Module #3: Intrinsic Muscles of the larynx (21min+quiz)	
4	Oct 25	phonation, voice quality, acoustic measures of phonation	Ch 4, p137-154	Module #4: innervation of the larynx (14min+quiz)	
5	Nov 1	clinical measures of phonation	Ch 5, p155-163 Ch 5, 176-188	Module #5: Vocal fold layers (23min+quiz)	Lab 1: vowels Quiz 2
6	Nov 8	stop and fricative articulation and disorders	Ch 6, 240-246 Ch 7 p 260-276 Kent & Read, 38-43 Mandaluk, 2011	Module #6: the Pharynx (21min+quiz)	
7	Nov 15	Nasals and resonance disorders	Ch 7, 276-278 (resonance problems) Kummer, 2011a and 2011b	Module #7: the Velum (14min+quiz)	Quiz 3
8	Nov 22	liquids, bio feedback, intonation & motor control	Ch 6 239-240 (liquids) Ch 6 p246-249 (production of speech sounds in context)		EPA Lab 2: voice
9	Nov 29	perception and hearing loss review	Ch 8 p293-304 Ch 9		Quiz 4

EVALUATION

[FAQs for students using myCourses: Assignments.](#)

The use of generative artificial intelligence tools or apps for assignments in this course, including tools like ChatGPT and other AI writing assistants, is prohibited. Spelling and grammar checkers are allowed.

Evaluations consist of assignments, quizzes and a final take-home exam with this breakdown:

- **Assignments: 40% (20% each)**
- **Quizzes: 10% (2.5% each)**
- **Anatomy module quizzes: 30% (5% each)**
- **Final exam: 20%**

Quiz	Dates Available
Quiz 1	Oct 4 - Oct 11
Quiz 2	Oct 28 - Nov 4
Quiz 3	Nov 11 - Nov 18
Quiz 4	Nov 25 - Dec 4

Labs	Targeted Competencies	Due Date	% of Final Grade
Lab 1: voice	1.1.ii, 1.7.i	Nov 4	20%
Lab 2: vowels	1.1.ii, 1.5.ii	Nov 18	20%

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

MCGILL POLICY STATEMENTS

- Language of submission
“In accord with McGill University’s [Charter of Students’ Rights](#), students in this course have the right to submit in English or in French written work that is to be graded. This does not apply to courses in which acquiring proficiency in a language is one of the objectives.” (Approved by Senate on 21 January 2009)

« Conformément à [la Charte des droits de l'étudiant](#) de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté, sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue. » (Énoncé approuvé par le Sénat le 21 janvier 2009)
- Academic integrity

“McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the [Code of Student Conduct and Disciplinary Procedures](#)” (Approved by Senate on 29 January 2003) (See [McGill’s guide to academic honesty](#) for more information).

« L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le [Code de conduite de l'étudiant et procédures disciplinaires](#). » (Énoncé approuvé par le Sénat le 29 janvier 2003) (pour de plus amples renseignements, veuillez consulter le [guide pour l'honnêteté académique de McGill](#).)

[Assessment](#) | [Basic needs](#) | [Charter of Students’ Rights](#) | [Inclusive learning environment](#) | [Learning support resources](#) | [Mercury course evaluations](#) | [Respect](#) | [Sustainability](#) | [Text-matching and AI](#) | [Wellness](#) | [Workload management skills](#)

- Assessment: The [University Student Assessment Policy](#) exists to ensure fair and equitable academic assessment for all students and to protect students from excessive workloads.
- Basic needs: If you have difficulty affording food or if you lack a safe and stable place to live, and believe that these circumstances may affect your performance in this course, I encourage you to contact the [Dean of Students](#), who can connect you with support services. If you feel comfortable doing so, please let me know as well so we can discuss how I can best support your learning. [adapted from [Goldrick-Rab, 2017](#)]
- Charter of Students’ Rights: Additional policies governing academic issues that affect students can be found in the [McGill Charter of Students’ Rights](#).
- Inclusive learning environment: As the instructor of this course, I endeavor to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me and/or [Student Accessibility and Achievement](#).
- Learning support resources: Consult resources from [Teaching and Learning Services](#) (TLS) on topics such as time management, study strategies, group work, exam prep, and more. TLS also offers opportunities to connect with an academic peer mentor through [Stay on Track](#) and to attend workshops. For further individualized support check out the programs and resources from [Student Accessibility & Achievement](#).
- Mercury course evaluations: [Mercury course evaluations](#) are one of the ways that McGill works towards maintaining and improving the quality of courses and the student’s learning experience. You will be notified by e-mail when the evaluations are available. Please note that a minimum number of responses must be received for results to be available to students.
- Respect: The University is committed to maintaining teaching and learning spaces that are respectful and inclusive for all. To this end, offensive, violent, or harmful language arising in course contexts may be cause for disciplinary action.

- Sustainability: McGill has policies on sustainability, paper use, and other initiatives to promote a culture of sustainability at McGill. See the [Office of Sustainability](#).
- Work submitted for evaluation as part of this course may be checked with text-matching software within myCourses. The use of generative artificial intelligence tools or apps for assignments in this course, including tools like ChatGPT and other AI writing assistants, is prohibited. Spelling and grammar checkers are allowed.
- Wellness: Many students may face mental health challenges that can impact not only their academic success but also their ability to thrive in our campus community. Please reach out for support when you need it; [wellness resources](#) are available on campus, off campus, and online.
- Workload management skills: If you are feeling overwhelmed by your academic work and/or would like to further develop your time and workload management skills, don't hesitate to seek support from [Student Services](#).