

# Neural Basis of Speech, Language, and Music

## COMD7V73.501 / HCS 7V71.501-F20 FALL 2020

### Online Course Syllabus

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### Course Modality and Expectations

<b>Instructional Mode</b>	<b>Online*</b> All instruction will be online. <a href="https://www.utdallas.edu/fall-2020/fall-2020-registration-information/">https://www.utdallas.edu/fall-2020/fall-2020-registration-information/</a>
<b>Course Platform</b>	Microsoft Teams
<b>Expectations</b>	Students will complete weekly reading assignments
<b>Asynchronous Learning Guidelines</b>	This course is online so we will all be “asynchronous” more information is available at: <a href="https://www.utdallas.edu/fall-2020/asynchronous-access-for-fall-2020/">https://www.utdallas.edu/fall-2020/asynchronous-access-for-fall-2020/</a>

### COVID-19 Guidelines and Resources

The information contained in the following link lists the University’s COVID-19 resources for students and instructors of record.

Please see <http://go.utdallas.edu/syllabus-policies>.

Please read the info below to be prepared should you become think you have COVID:

<https://utdallas.edu/coronavirus/faq/#students>

### Introduction

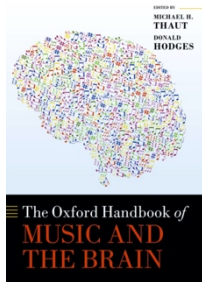
Music and language are integral and universal components of human nature, as proven by their ubiquity across all cultures. There is a growing body of evidence indicating connections between music and language abilities. The advent of state-of-the-art neuroscience technology (e.g., functional neuroimaging) allows us to study the relations more systematically at the neural level. This course is designed to offer a general overview of the neuroscience of speech, language, and music, a glimpse of research in this emerging discipline, and a sample of the wide variety of current and possible applications for speech/language interventions of clinical and aging populations. The course does not require a background in neuroscience.

### Student Learning Objectives/Outcomes

1. Students will understand how our minds process both low-level (e.g., acoustic properties) and high-order aspects (e.g., meaning) of sound in speech, language, and music.
2. Students will gain appreciation for how musicality affects speech and language performance.

3. Students will become familiar with a wide variety of settings in which music is used to improve speech and language functions. By the end of the course, students will learn various music-based intervention programs for speech/language impairments secondary to neurological/developmental disorders.
4. Students will learn how to critically evaluate designs, findings, and implications in research articles pertaining to the course topic.

### **Recommended Textbooks and Materials**



The Oxford Handbook of Music and the Brain (2019)  
Michael H. Thaut & Donald A. Hodges Publishing.  
ISBN-13: 9780198804123. ISBN-10: 0198804121

*New and used copies are available on Amazon.com, Barnesandnoble.com, and other on-line book sellers.*

### **Class Participation**

Regular class participation is expected regardless of course modality. Students who fail to participate in class regularly are inviting scholastic difficulty. A portion of the grade for this course is directly tied to your participation in this class. It also includes engaging in group or other activities during class that solicit your feedback on homework assignments, readings, or materials covered in the lectures (and/or labs). Class participation is documented by faculty. Successful participation is defined as consistently adhering to University requirements, as presented in this syllabus. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

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### **Class Recordings**

Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

The instructor may record meetings of this course. Any recordings will be available to all students registered for this class as they are intended to supplement the classroom experience. Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. If the instructor or a UTD school/department/office plans any other uses for the recordings, consent of the students identifiable in the recordings is required prior to such use

unless an exception is allowed by law. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

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### **Class Materials**

The Instructor may provide class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may be downloaded during the course, however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

### **Technical Requirements**

In addition to a confident level of computer and Internet literacy, certain minimum technical requirements must be met to enable a successful learning experience. Please review the important technical requirements on the [Getting Started with eLearning](#) webpage.

### **Course Access and Navigation**

This course can be accessed using your UT Dallas NetID account on the eLearning website. Please see the course access and navigation section of the Getting Started with eLearning webpage for more information. To become familiar with the eLearning tool, please see the Student eLearning Tutorials webpage.

UT Dallas provides eLearning technical support 24 hours a day, 7 days a week. The [eLearning Support Center](#) includes a toll-free telephone number for immediate assistance (1-866-588-3192), email request service, and an online chat service.

### **Communication**

This course utilizes online tools for interaction and communication. Some external communication tools such as regular email and a web conferencing tool may also be used during the semester. For more details, please visit the [Student eLearning Tutorials](#) webpage for video demonstrations on eLearning tools.

Student emails and discussion board messages will be answered within 3 working days under normal circumstances.

### **Distance Learning Student Resources**

Online students have access to resources including the McDermott Library, Academic Advising, The Office of Student AccessAbility, and many others. Please see the [eLearning Current Students](#) webpage for more information.

### **Server Unavailability or Other Technical Difficulties**

The University is committed to providing a reliable learning management system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and also contact the online [eLearning Help Desk](#). The instructor and the eLearning Help Desk will work with the student to resolve any issues at the earliest possible time.

## Course Schedule

*The descriptions and timelines are subject to change at the discretion of the Professor; changes will be announced in class and via e-learning.*

	Topic	Reading
Aug. 19 <sup>th</sup>	Course overview	N/A
Aug. 26 <sup>th</sup>	Music & Cognition, part I	<ul style="list-style-type: none"> <li>• <b>Music and cognitive abilities.</b> Schellenberg &amp; Weiss (2013) <i>Curr. Direct in Psy. Sci.</i></li> </ul>
Sep. 2 <sup>nd</sup>	Music & Cognition, part II	<ul style="list-style-type: none"> <li>• <b>Ch. 7 Musical expertise and brain structure: the cause and consequences of training.</b> Penhune.</li> <li>• <b>Music lessons enhances IQ.</b> Schellenberg et al. (2004). <i>Psy. Sci.</i></li> </ul>
Sep. 9 <sup>th</sup>	Music and Speech, part I	<ul style="list-style-type: none"> <li>• <b>Why would musical training benefit the neural encoding of speech?</b> Patel (2011). <i>Front. Psy.</i></li> </ul>
Sep. 16 <sup>th</sup>	Music and Speech, part II	<ul style="list-style-type: none"> <li>• <b>Musician's enhanced neural differentiation of speech sounds arises early in life.</b> Strait et al. (2014). <i>Cerebral Cortex</i></li> </ul>
Sep. 23 <sup>rd</sup>	Music and Language part I	<ul style="list-style-type: none"> <li>• <b>Ch. 24 The role of musical development in early language acquisition.</b> Brandt et al.</li> </ul>
Sep. 30 <sup>th</sup>	Music and Language part II	<ul style="list-style-type: none"> <li>• <b>Temporally regular music primes facilitate subsequent syntax processing in children with specific language impairment.</b> Bedoin et al. (2016). <i>Front. Neurosci.</i></li> <li>• <b>Short-term music training enhances verbal intelligibility and executive function.</b> Moreno et al. (2011). <i>Psy. Sci.</i></li> </ul>
Oct. 7 <sup>st</sup>	Rhythm skills and Speech/Language Disorders	<ul style="list-style-type: none"> <li>• <b>A temporal sampling framework for developmental dyslexia.</b> Goswami (2011). <i>Trends in Cognitive Science</i></li> </ul>

<b>Oct. 14<sup>th</sup></b>	Music and Hearing	<ul style="list-style-type: none"> <li>• <b>Speak on time! Effects of a music rhythmic training on children with hearing loss.</b> Hidalgo et al. (2017). <i>Hearing Research</i></li> <li>• <b>Music training improves speech-in-noise perception.</b> Slater et al. (2015). <i>Behavioral Brain and Research</i></li> </ul>
<b>Oct. 21<sup>st</sup></b>	Music and Aging	<ul style="list-style-type: none"> <li>• <b>Individualized piano instruction enhances executive functioning and working memory in older adults.</b> Bugos et al. (2007). <i>Aging &amp; Mental Health</i></li> </ul>
<b>Oct. 28<sup>th</sup></b>	Music and Dopamine part I	<ul style="list-style-type: none"> <li>• <b>The effect of dopaminergic medication on beat-based auditory timing in Parkinson's disease.</b> Cameron et al. (2016). <i>Frontiers in Neurology.</i></li> </ul>
<b>Nov. 4<sup>th</sup></b>	Music and Dopamine part II	<ul style="list-style-type: none"> <li>• <b>Prediction and the brain: how musical sounds become rewarding.</b> Salimpoor et al. (2015). <i>Trends in Cog. Sci.</i></li> </ul>
<b>Nov. 11<sup>th</sup></b>	Cortical organization of music	<ul style="list-style-type: none"> <li>• <b>Ch. 5 Cerebral organization of music processing.</b> Thenille Braun Janzen and Michael Thaut.</li> </ul>
<b>Nov. 18<sup>th</sup></b>	Cortical organization of speech & language	<ul style="list-style-type: none"> <li>• <b>Towards new neurobiology of language.</b> Poeppel et al. (2012). <i>J. Neurosci.</i></li> <li>• <b>The cortical organization of speech processing.</b> Hickok &amp; Poeppel (2007). <i>Nat. Rev. Neurosci.</i></li> </ul>
<b>Nov. 25<sup>th</sup></b>	Course wrap-up	N/A

### Course Requirement

- Class participation (50%) Be prepared for lectures and discussion by completing the readings. Of course, you need to attend class to participate. But you also need to be able to formulate and answer questions. Be generous (and brave!) in sharing your thoughts and creating an intellectually stimulating environment. The more we engage in discussion, the more interesting our meetings will be.

- Article presentation (50%) Each student is expected to present two articles by the end of the semester.

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### Grading

A (4.00)	94	A- (3.67).	90	B+ (3.33).	87	B (3.00)	84
B- (2.67)	80	C+(2.33)	77	C (2.0)	74	C- (1.67)	70
D+ (1.33)	67	D (1.00)	6	D- (0.67)	60	E (0)	<60

### Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

*“As a Comet, I pledge honesty, integrity, and service in all that I do.”*

### Academic Support Resources

The information contained in the following link lists the University’s academic support resources for all students.

Please go to [Academic Support Resources](#) webpage for these policies.

### UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University’s policies and procedures segment of the course syllabus.

Please go to [UT Dallas Syllabus Policies](#) webpage for these policies.

*The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.*

**Please refer to the link below for additional class policies**

**<http://provost.utdallas.edu/syllabus-policies/>**