

## AUDI 403: Introduction to Neurolinguistics (Outline)

This 1.5 credit on-line course addresses historical and current theories and issues in studying the neuroanatomical substrates associated with language processing, including brain imaging, localization, and lateralization of language functions.

This course is of particular interest to students wanting to fulfill prerequisites when applying to a graduate program in communication sciences and disorders; however, it will also likely attract some students from linguistics, psychology, cognitive systems, speech sciences, or other disciplines who are interested in studying the topics of language and the brain.

### Learning objectives

At the completion of AUDI 403, students will:

- have a basic understanding of key theories, issues, and domains of investigation in neurolinguistics
- be able to describe and critique past and current approaches to studying the neuroanatomical substrates associated with language processing
- be able to identify and interpret relations between the brain and major domains of language processing in normal and brain-impaired populations

### Unit One: Introduction to the study of language and the brain

- Understand how to proceed through the course
- Get acquainted with other students and the instructor
- Ask questions and receive feedback regarding syllabus, topics, and assignments
- Explore why neurolinguistics is an important field of study

### Unit Two: Historical perspective

- Learn from past ways of thinking about the brain and language
- Be able to describe the major characteristics and evidence in support of modern approaches to studying brain-language relationships

### Unit Three: Assessing brain function: Imaging

- Become familiar with the most common functional brain imaging methods and describe the strengths and limitations of each
- Identify some of the challenges faced in using functional imaging to map language processing onto cortical regions and events

### Unit Four: Language lateralization in the brain

- Describe anatomical, clinical, and experimental evidence for cerebral hemispheric lateralization of language

- Identify exceptions to hemispheric dominance for language, including right hemisphere support

#### Unit Five: Language localization in the brain

- Identify cortical and subcortical regions associated with different aspects of language processing
- Review and compare findings from deficit-lesion analysis and functional brain imaging studies

#### Unit Six: Psycholinguistic matters in understanding language and the brain

- Describe the roles of processing mechanisms and constraints in normal and impaired language use
- Develop a critical awareness of important theoretical and methodological issues in neurolinguistic research

### Topics covered in each Unit

#### Unit One: Introduction to the study of language and the brain

- Questions about Syllabus Content
- What is Neurolinguistics?
- Why is it of interest?
- How do researchers investigate the neural basis of language?

#### Unit Two: Historical perspective

- Pre-Modern Period
- Modern Times
- Localizationist Theory
- Holist Theory
- Contemporary Neurolinguistics

#### Unit Three: Assessing brain function: imaging

- Brain Imaging Techniques and Procedures: Structural and Functional
- Assumptions and Challenges in Functional Imaging Research
- Future Imaging Research

#### Unit Four: Language lateralization in the brain

- Anatomical Structure
- Handedness
- Clinical Evidence: Aphasia, Wada, Commissurotomy
- Experimental Evidence: Dichotic Listening, Visual Half-Field Processing

- Right Hemisphere Contributions to Language Processing

#### Unit Five: Language localization in the brain

- Deficit-Lesion Analysis and Localization
  - Lesion types
  - Aphasia types and sites
  - Extraperisylvian support for language
- Functional Brain Imaging and Localization
  - Phonological processing
  - Lexical-Semantic processing
  - Syntactic processing

#### Unit Six: Psycholinguistic matters in understanding language and the brain

- Psycholinguistics and the Brain
- An example from syntax
- Cognitive processing factors
- Psycholinguistic Accounts of Aphasia
- Psycholinguistic Matters in Functional Brain Imaging of Language

## Course components

### Readings

The required course readings (scholarly journal articles) linked to each topic are available as e-links through the UBC library website.

### Discussions

Throughout the course, an integral part of your learning will occur through communicating with other students and the instructor via the Discussion Forums. The discussion questions for each topic will guide you in preparing for the discussion forums and the final exam. You are also encouraged to discuss these questions and the material with other students on your own.

### Web/Internet

Links to other websites will be employed as needed for the purposes of providing students with supplementary images of neuroanatomy, illustrations and explanations of functional brain imaging techniques, and animations relevant to language processing. Students' contributions are welcomed.

## Final Exam

The final exam covers material from Units 2-6 and may include short answer, true-false, and multiple choice responses. Students should be familiar with the content through regular self-study, reading, and peer interaction. Different versions of the exam will be administered to different students. This is a closed book exam! Students must not make use of any books, papers, notes or information from websites. Students must not speak or communicate (including in writing, e-mail, phone or other mobile device, etc.) with other students/persons during the exam period. Students guilty of any of these or similar actions shall be liable to disciplinary action. No student shall be permitted to ask questions of the instructor, except in cases of technical difficulties related to completing the exam.

All students are required to have completed and submitted all course work (according to the course schedule) prior to the final exam date in order to be eligible to write. Students are advised to review the guidelines pertaining to examinations on the website and in the *Learner's Guide*.

### Procedure for Missed Assignment Deadlines

Five points will be deducted from late submissions for every day that passes since the deadline (unless students provide evidence of a legitimate excuse, e.g., doctor's note regarding illness).

If the exam is missed, an original doctor's excuse (or equivalent) must be submitted before a make-up exam will be scheduled.

## Student Evaluation (Grading)

### 20% - Participation

- Written Bio = 3%
- Discussion Forums = 17%

### 80% - Final Exam