AUDI 402: Neuroanatomy for Audiology and Speech-Language Pathology (Outline)

This 3 credit course provides an overview of neuroanatomy and functional neuroanatomy with emphasis on neuroanatomy related to hearing and speech mechanisms. This course is particularly designed for students wanting to fulfill neuroanatomy prerequisites when applying to a graduate program in communication sciences and disorders.

Course Learning Objectives

At the completion of Audiology 402, students will be able to:

- Discuss the components of the nervous system, selected features of their development, and their structural and functional relationships.
- Describe the mechanisms underlying the transmission of information in the nervous system at the gross and cellular levels.
- Describe selected structural features of the telencephalon, diencephalon, brainstem, cerebellum, and spinal cord, their relationships, circulation (vascular and cerebrospinal fluid), and function in general terms.
- Describe and compare representative examples of afferent and efferent pathways, their course and their relationship to nervous system function.
- Describe the cranial nerves, in terms of their structure, function, course, common lesions, clinical testing, and significance with an emphasis on those relevant to audiology and speech sciences.
- Explain the neural circuits involved in the production and appreciation of meaningful sound.
- Discuss cortical function as it relates to selected general function and to the special functions involved in communication.
- Describe selected dysfunctional states of the central nervous system with an emphasis on those relevant to clinical practice.
- Explain the impact of dysfunction of selected parts of the nervous system on the whole patient and his/her ability to communicate and to access and benefit from therapeutic intervention.
- Use correct clinical terminology to discuss the neuroanatomical basis of common dysfunctional states that relate to hearing and speech neuropathology and impairments of cognitive processing.
- Given a case presentation of a client with neurological impairment, problem solve for sites of pathology - with an emphasis on communication impairments.
- Given the site of a neuroanatomical lesion, discuss the expected specific and associated functional loss.

Topical Outline

Module 1: Structure and Function of the Nervous System
Lesson 1: Introduction to Neuroanatomy
Lesson 2: Coverings and Spaces of the Brain and Spinal Cord
Lesson 3: Blood Supply of the Nervous System

Module 2: Communication
Lesson 4: Peripheral Nervous System (PNS); Autonomic Nervous System (ANS)
Lesson 5: General Sensory Receptors and Afferent Tracts
Lesson 6: Efferent Tracts and Relationships

Module 3: Cranial Nerves
Lesson 7: Cranial Nerve VIII, Auditory.
Lesson 8: Cranial Nerves I-IV And VI.
Lesson 9: Cranial Nerves V and VII.
Lesson 10: Cranial Nerves IX - XII.

Module 4: Sensory System
Lesson 11: Higher Centers: Cerebrum
Lesson 12: Sensory system: Thalamus
Lesson 13: Limbic and Reticular Systems

Module 5: Motor System
Lesson 14: Voluntary Movement - From the Cerebral Cortex
Lesson 15: Motor Control - (Coordination): Cerebellum
Lesson 16: Motor Control - (Programming): Basal Nuclei

Module 6: Injury and Repair
Lesson 17: Neuroplasticity and Recovery
Lesson 18: Neuropathology of Communication Disorders

Readings

Text
Bhatnagar, S.C. *Neuroscience For The Study Of Communicative Disorders*. Williams & Wilkins, Baltimore MD. 4th ed. 2013. You will need to use this text as you work through all of the content sections and learning activities on line. There are many other excellent sources you may access, but in the interest of time, we are going to work primarily from this text.

Websites
Supplementary information to be found on websites will be suggested, but only the specific information suggested has been reviewed for accuracy.

Student Evaluation (Grading)

Quizzes	10%
Participation	5%
Short Written Assignment	5%
Midterm Exams (2 x 15% each)	30%
Final Exam	50%

