**Instructor:** Dr. Richard K. Adler, CCC, SLP, F-ASHA  
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**Location:** MWF, King Hall 218  
**Time:** 10am to 10:50am


**Course Objectives:** This course will give each student an understanding of the neuroanatomy and physiology of the human brain. It is essential to know the anatomy so that it will be easier to understand what parts of the Central Nervous System (CNS), Sensory Systems, Motor Systems, Brain Stem, and other integrated systems are affected when a patient has had a brain infarction including TBI, CVA, or a degenerative Disease. Note the following learner outcomes:

a. Each student will demonstrate a comprehensive knowledge and understanding of basic neuroanatomy terms.

b. Each student will be able to identify which area(s) of the brain are involved in a particular neurogenic disorder of speech or language.

c. Each student will be able to understand the critical function(s) of each of the major systems in the brain.

d. Each student will be able to randomly apply the neuroanatomy concepts and terms learned in this class to critical clinical issues through research articles, case histories, and class discussions of actual patients seen in a clinic.

**Topics to be Covered:**  
1. Introduction to the Elements of Neuroanatomy  
2. Gross Anatomy of the CNS  
3. Internal Anatomy of the CNS  
4. Embryological Development of the CNS  
5. Nerves  
6. Diencephalon—Thalamus and Associated Structures  
7. Somatosensory System  
8. Visual System and how it relates to SLP’s and AUD’s  
9. Auditory System
10. Vestibular System
12. Motor System Two: Cerebellum
13. Motor System Three: Basal Ganglia (BG) and Brainstem
14. Motor System Four: Motor Cortex
15. Cranial Nerves
16. ANS including Limbic System, Hypothalamus, and Reticular Formation
17. Vascular System
18. CSF
19. Cerebral Cortex: Higher Mental Functions (Do you have any or are they still on summer vacation?)
20. Diagnostics and Neurological Concepts

This Course Meets ASHA Standards:
1. Standard IIIB: Demonstrate knowledge of basic human communication and swallowing processes, including their biological, neurological, acoustic, psychological, developmental, and linguistic and cultural bases.
2. Standard IIIC: Demonstrate knowledge of the nature of speech, language, hearing, and communication disorders and differences and swallowing disorders, including etiologies, characteristics, anatomical/physiological, acoustic, psychological, developmental and linguistic and cultural correlates.
3. Standard IIIID: Demonstrate knowledge of the principles and methods of prevention, assessment, intervention for people with communication and swallowing disorders, including consideration of anatomical/physiological, psychological……..and cultural correlates of the disorders.
4. Standard IVG: Complete a program of study that includes supervised clinical experiences….to achieve skills outcomes such as evaluations, screenings, collection of case histories, compilation of behavioral data…and to identify appropriate interaction and personal qualities necessary to complete the requirements of the clinical portion of the program…..including ASHA code of ethics, collaboration with other professionals, and recognizing the…multicultural needs of patients.

Course Requirements:
Students will be assigned to a Dyad. (what’s a dyad?)

1. You have a set of discussion questions by chapters. Each dyad is required to either email the definitions, use D2L to post the definitions, or turn in a typed, written set of questions/answers for each chapter, to the instructor by 10am on Monday starting August 30 for chapter 1. You may work ahead of schedule. Answers do not have to be very elaborate--just answer the question. (20% of your final grade). These may be answered by reading the text or by using other texts related to Neuroscience or Neuroanatomy. You are required to turn in one set of answers for each dyad but you should work together. Be prepared to discuss these and other questions in class. This will be difficult if you haven’t bothered to read the text.
2. Research articles describing a Neurological Problem that will be encountered when you are an SLP or an Audiologist. Each dyad will find two articles in the speech, language, or hearing journals or a related professional journal that deal with therapy, evaluation, counseling, etc. for a particular speech, language, or hearing disorder (i.e. TBI, Stroke, Alzheimer’s, Presbycusis, etc.) Each article must be on a different neurological concept or disorder. A ONE PAGE critique of the article will be required to be turned in to the instructor…I will be checking for writing style, mechanics of writing, and to see how well you can express your opinions and “Think, Analyze, or Make Inferences.” Each pair of students will verbally present one of the article critiques to the class. There will be a schedule given out detailing when each dyad presents. This will be worth 20% of your grade.

3. Midterm Examination including Lab Exam: This will be worth 30% of your grade. Students will work in dyads for the midterm. Exams will be in class (see schedule below for date and time). The exam will be fill-ins and perhaps other short answer questions.

4. Final Examination including Lab Exam: This will be worth 30% of your grade. Students will take the final exam individually. Exams will be short answer/fill-ins. Final Exam is on Wednesday, December 15, 2004 from noon to 2pm.

Text Readings: It is assumed that each student will keep up with the chapter readings in the text. Your Dyad Vocabulary Words will come from the text so it is important that you keep up with the readings. I like Lecture/discussion classes. I emphasize “discussion” because I like it when the students interact in class…it is more interesting for the student that way. Be inquisitive. I am trying to teach this course as a practical learning course for both the SLP and the AUD

Daily Course Outline:

WEEK OF:

August 23: Chapter 1 and start of chapter 2. Introduction to Neuroscience, Neuroanatomy and the Gross Anatomy of the CNS. No Class on Friday, August 27 due to Faculty Retreat Meeting.

August 30: Finish Chapter 2 and begin Chapter 3. Gross Anatomy of the CNS and Internal Anatomy of the CNS. (Introduction to Disorders affected by lesions of the CNS.

September 6 (No class on the 6th—Labor Day Holiday) Finish Chapter 3 and begin Chapter 4: Finish Internal Anatomy of the CNS; Embryological Development of the CNS and disorders associated with it.

September 13: Finish chapter 4 and begin Chapter 5 on Nerve Cells. Discussion of Neurotransmitters and their function as well as Synapses and how they work; discussion of disorders associated with Neurotransmitters.
September 20: Finish Chapter 5; Chapter 6 on the Thalamus and Associated Structures. Why is this chapter primarily on the Thalamus?

September 27: Chapter 7: Somatosensory System/relationship to cranial nerves; Begin Chapter 8: The Visual System; Disorders Associated with it.


October 11: Finish up Chapter 8 and 9 on Monday; Midterm Examination on Wednesday, October 13th (Students may come in early to begin the exam and stay after 11am if they wish to have more time; if our room is not available, I will find another room for us.)

NO CLASSES HELD ON FRIDAY OCTOBER 15: All University In-Service Day.

October 18: Chapters 11 and 12: Spinal Cord and Cerebellum; Disorders in SLP and Audiology as they are affected by damage to these areas of the CNS.

October 25: Chapters 13 and 14: Brain Stem and Motor Cortex; Disorders associated with damage to these areas.

November 1: Chapter 15: Cranial Nerves; Disorders that are commonly associated with C.N. Damage.

November 8: Begin Chapter 16: ANS, Limbic System, Hypothalamus; Reticular Formation; I want all of you to be excited and “aroused” by these areas; (remember the words fornix, amygdala, and hippocampus).

November 15: Monday: Finish Chapter 16 and Begin Chapter 17: Vascular System; disorders associated with damage to these areas. (NO CLASS ON THE 17th or 19th—I will be at the ASHA convention). I will arrange for someone to show a CD on brain dissection during one of those days that I will not be in class.

November 22: Monday: Finish Chapter 17 and do Chapter 18: CSF. NO CLASSES ARE HELD ON THE 24th or 26th).

November 29: Review Chapters 17 and 18; Begin Chapter 19: Cerebral Cortex: Higher Mental Functioning including disorders associated with CVA and TBI.

December 6: Finish Chapter 19 and Do Chapter 20: Diagnostic Techniques and Other Neurological Concepts that are needed for those working in a Hospital or Nursing Home and for those who want to learn how to read a physician’s order. Last Day of Classes for this semester is December 8. December 9th is Study Day.

December 15, Wednesday: Final Exam in King 218 from Noon to 2pm.
Office Hours:
- Mondays: 1pm to 2pm; 3 pm to 4pm
- Tuesdays: 10am to 11am
- Wednesdays: 1pm to 2pm
- Thursdays: 9am to 11am
- Fridays: 1pm to 2pm

Feel free to just drop in as needed. Usually my door is open unless I am in the middle of grading papers or doing some research. Let me know how I may help you.

Grades for this Course:

- 98-100: A+
- 95-97: A
- 91-94: A-
- 88-90: B+
- 85-87: B
- 81-84: B-
- 78-80: C+
- 74-77: C
- 71-73: C-
- 68-70: D+
- 65-67: D
- 61-64: D-
- 60 or Below: F

If a student’s average comes out to be, for instance, 87.5, I will usually round that off to an 88 and the student would get a B+ but if the average was 87.3, the student usually gets a B unless throughout the semester I know that the student worked very hard and I would usually bump up the B to a B+ at my discretion. If the student did not show much initiative, then a B would be given.

Attendance: You are required to attend every class. You cannot make up an exam or an oral presentation unless you are extremely ill or if there was a death or severe illness in your family. Written assignments are due as stated—no exceptions. If you are persistently late or absent, I will use that record to help me decide your final grade if you are between for instance, an A or B or C. I will also ask you to have a conference with me ASAP as to the reasons for your tardiness or absences. So just show up for class and ask lots of questions. Let’s be adult about it.

Lab: This semester we are fortunate to be able to use King 218 which is a regular laboratory classroom. We will be able to look at our specimens every day if we want to. If you have a genuine problem being in a lab with human specimens, please see me IMMEDIATELY, like today. I suggest you go to the Biology Department and purchase a very unattractive and temporary “Lab Coat” that costs about $3. You may buy a regular lab coat in the uniform store if you prefer but that is not required. Either way, I suggest
you don’t wear very nice clothing during lab in case you spill some preservative on your clothes. It won’t be pretty.

**Cheating, Laziness, and Plagiarism:** I have no tolerance for lazy or cheating students. If you plagiarize, you automatically fail that assignment with a grade of F. If you cheat and are caught, you will also get an automatic F for that test or assignment. Lazy students and students who cheat bug me. If you are shy that is a different story……I can accept that. So just don’t cheat and if you have any questions about plagiarism, come and talk to me.

**Disability Students:** A documented disability (physical, mental, emotional, learning, or other) allows a student to have accommodations to help him/her with the class. “Students with Disabilities who believe they may need an accommodation in this class are encouraged to contact Greg Toutges, Coordinator of Disability Services at MSUM at 477-2652 or 477-2047 (TTY), CMU 222 as soon as possible to ensure that accommodations are implemented in a timely fashion.

**Tutoring Help:** If a student feels that he/she need tutoring help in this class, feel free to speak to me and I can help you arrange a tutoring meeting.
Email Accounts: I would like to ask all of those students who do not use an “mnstate.edu” email to get one and tell me what it is so I can add you to the class listerve using the MSU email.

Oftentimes, hotmail accounts fill too easily or you might forget to look at your email one day and there could be an important message about weather related cancellations or something of that nature.

If you have an mnstate.edu email, you will automatically get a cancellation email but if you use your hotmail account (or an email address other than mnstate.edu), you will not be informed of such cancellations or other matters.

Final Exam Policy: When you get all of your class syllabi, check to see if you are scheduled for more than two class exams or final exams in one day. You are not required to sit for more than two class exams or final exams in one single day. You may make arrangements to change that as soon as you find out about the exam schedules for your classes.

Plagiarism/Turnitin.Com: In this course, all required assignments may be subject to submission for textual similarity review through the Turnitin.com web site. The instructor may then use the tool to check for originality of students’ work. All submitted papers may be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Terms and Conditions of Use posted on the Turnitin.com website:

http://www.mnstate.edu/instructres/turnitin.htm
Chapter 1: Due August 30.

1. Using two examples, describe the relationship between Neuroscience and the fields of SLP and Audiology.

2. Name four brain diseases and tell one symptom, one speech or language problem, and whether it is from a degenerative, vascular, etc. cause.

3. Describe the difference between Neurophysiology and Neuropathology.

4. What is the difference between ipsilateral and contralateral?

5. Name and define two terms relating to movement and two terms related to muscles.

6. Is there a difference between a sulcus, gyrus, fissure, and convolution? If so, what is the difference and name one of each?

7. How do we use Deductive Reasoning and Problem Solving to decide where a lesion might be located? Review the 10 rules that assist in localizing a lesion.

Chapter 2: Due September 8.

1. How do you differentiate the central nervous system from the peripheral nervous system?

2. What are the structures that make up the CNS and the PNS?

3. What do these structures do?


5. P. 74: Do questions 5, 6, 30, 46
Chapter 3: Due September 13
1. Pp. 109-110: do questions 4, 6, 8, 15, 16, 19, 21, 29

Chapter 4: Due September 20
1. P. 124: Do questions 3, 6, 9, 10, 11

Chapter 5: Due September 27
1. P. 141: Do questions 2, 3, 8, 9, 10, 12, 16

Chapter 6: Due October 4
1. P. 152: Do questions 1, 3, 10, 11

Chapter 7: Due October 11
1. Describe the neural pathways for Proprioception.
2. Discuss some common disorders of sensation.
3. What is unconscious proprioception?
4. What is phantom pain?
5. Why do people have that?

Chapter 8: Due October 18
1. What are the structures and functions of the retina?
2. Name two types of refraction errors.
3. Define them.
4. What is Left or Right Neglect? How is that different than Left or Right Field of Vision Cut?
5. How would either of the above affect us as SLP’s or Audiologists?
6. Describe how rods and cones are stimulated. How do they help us see? What do they have to do with color vision?
Chapter 9: Due October 25

1. State the differences between the outer, middle, and inner ears as far as purpose and function.

2. What is the difference between a conductive and sensorineural hearing loss?

3. Explain the functions of the descending auditory pathway.

4. P. 208: Case Study: Patient TWO: Answer the one question.

Chapter 10: Due November 1

1. How does the vestibular system in our ears help with our equilibrium?

2. What structures make up the vestibular system?

3. What happens to us neurologically when we have nystagmus?


Chapter 11: Due November 8

1. Describe the anatomy of the spinal cord.

2. What do we mean by lower motor neurons? How do they help us function?

3. What are the major sensorimotor tracts? What are their functions?

4. What is the difference between the ascending and descending spinal tracts?

5. How do they differ in functions?

6. What is the difference between a complete spinal cord lesion and a hemisection syndrome?

Chapter 12: Due November 8

1. What is the importance of the cerebellum for our motor activity?

2. What are some of the major symptoms of cerebellar dysfunction?

3. List and describe three major diseases of the cerebellum.
4. P. 251: Answer the question for Case Study Patient Two.

5. How does cerebellar dysfunction affect motor speech?

**Chapter 13: Due November 15**

1. How does the reticular formation help in motor functions?

2. What are the structures of the B.G. and what are the functions?

3. Describe the differences between Parkinson’s Disease, Huntington’s Chorea, and Wilson’s Disease.

4. P. 264: Answer questions 10, 11, 12.

**Chapter 14: Due November 15**

1. Where are upper motor neurons located?

2. What is the difference between upper and lower motor neurons?

3. What accounts for the symptoms of spastic hemiplegia?

4. What C.N. nuclei are innervated by the corticobulbar tract?

**Chapter 15: Due November 22**

1. Where are the origins and insertions of each cranial nerve?

2. What is the function (motor, sensory, mixed) of each C.N.?

3. What causes Anosmia?

4. P. 314: Answer questions 12, 13, 14, 15, 17, 24, 30

**Chapter 16: Due November 29**

1. What are the main differences in the functions of the parasympathetic and sympathetic nervous systems?

2. What do hormones do for us?

3. What are the functions of the amygdala, fornix, hippocampus, and cingulate gyrus?
4. How is a hormone different from a neurotransmitter?

5. P. 335: Case Study Patient Five: Answer the question posted.

6. What is the overall function of the limbic system?

7. How does the reticular mechanism regulate cortical arousal, respiration, vomiting, swallowing, coughing?

**Chapter 17: Due November 29**

1. Why is blood circulation important for our brains?

2. What arteries help transport blood to the cerebrum?

3. Name some common types of CVA’s.

4. Why is the blood brain barrier so significant in relationship to what we do as SLP’s or Audiologists?

**Chapter 18: Due December 6**

1. What is the function of CSF?

2. How does Hydrocephalus occur? How is it treated?

**Chapter 19: Due December 6**

1. What are the major types of aphasia and their neurolinguistic characteristics?

2. Name three types of imaging that is now used to point out lesions and damage.

3. Define each of those you mentioned in #2 above.

4. What is apraxia? Neurologically, how does this occur?

5. What is the neuroanatomy of behavioral deficits?

6. How do Dementia, Aphasia, Apraxia, and Dysarthria differ?