



## Teaching Central Nervous System Concepts Using Diagnostic Radiology and Case Studies

HAPS Institute Graduate Credit Course  
BI 698 offered in conjunction with Alverno College

### **Instructor:**

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### **Description of this Course:**

This course will help instructors with incorporating radiology cases into their teaching portfolio. It is a perfect way to integrate anatomy with physiology and teach valuable diagnostic skills at the same time. Students planning a career in health care will benefit from learning clinical problem solving skills early in their academic development. The cases developed as part this course can be used as in class activities, enhancements to your current lecture Powerpoints, or as clicker quizzes or exam questions. This is a graduate course designed for instructors, teaching assistants, and lab coordinators.

### **Course Objectives:**

- 1.Explain arterial blood flow to the brain AND assess pathologies using MRI angiography.
- 2.Explain venous return of blood from the brain, assess arteriovenous malformations, and interpret venograms.
- 3.Explain how cerebrospinal fluid is made, identify brain ventricles via CT/MRI, and interpret the causes for hydrocephaly.
4. Interpret T1W and T2W MRIs for the purpose of diagnosing brain lesions. Placement of lesions will also be used to predict patient neurological symptoms.
- 5.Describe the meninges and diagnose different types of hematomas using CT scans.
6. Describe different types of cerebrovascular accidents (strokes) and predict patient symptoms depending on the location of the infarct.
7. Design in class case studies, quizzes, clicker questions, and exam questions using real patient case studies.

### **Evaluation:**

Participants will be evaluated by development of their course materials they construct each week. Each topic will be presented weekly on Google Classroom. Each student will be asked to

develop and submit electronically to the instructor (through Google Classroom) the following:

- A **Powerpoint slide lecture** with integrated clicker questions. The clicker questions will be used to assess your students' comprehension of what you are presenting.
- Design one **Active learning activity** of your choice that consists of Bloom's level 2 questions. These can be tables, fill in the blanks, short answer, matching worksheets. It should take your students about 10 minutes of class time.
- Design one **Case Study activity** that has clinical data, radiology, etc. These should include data interpretation, critical reading, analysis and integration of concepts. It should take your students about 10 minute of class time.
- Write **two exam questions** that you would ask on a written exam. These can be concept essays and case study questions that reflect what you have taught using the Powerpoint lecture, active learning activities, and case studies.

### Grading:

All HAPS-I courses follow grading policies on a "credit / no credit" basis. Like many progressive graduate programs, HAPS-I does not use letter grades in our courses. However, a "credit" grade is equivalent to a letter grade of B or better.

A "credit" grade is earned by satisfactorily accomplishing a set of specific goals (at a "B" level or better) as outlined in this course syllabus and in the online course material as determined by the course faculty.

### Course Schedule:

	<b>Topic</b>	<b>Book Chapters</b>	<b>Assignment Due</b>
Week 1: May 21-27 <sup>th</sup>	Brain development and congenital defects  CSF production. Ventricular system as assessed by CT	<b>Chapter 1</b>	<b>Powerpoint slide lecture,</b>  <b>In class Active Learning activity</b>  <b>In class Case Study activity</b>  <b>Exam questions assignment</b>
Week 2: May 30-June 3 <sup>rd</sup>	Arterial blood flow to the brain. MRI Angiography  Venous return from the brain and MRI venography	<b>Chapter 1</b>	<b>Powerpoint slide lecture,</b>  <b>In class Active Learning activity</b>  <b>In class Case Study activity</b>  <b>Exam questions assignment</b>
Week 3: June 6-10 <sup>th</sup>	Meninges, CSF analysis, hematomas  CVA's	<b>Chapter 1</b>	<b>Powerpoint slide lecture,</b>  <b>In class Active Learning activity</b>

			<b>In class Case Study activity</b> <b>Exam questions assignment</b>
Week 4: June 13-17 <sup>th</sup>	Cranial Nerves Lesions affecting the Cranial Nerve tracts	<b>Chapter 2</b>	<b>Powerpoint slide lecture,</b> <b>In class Active Learning activity</b> <b>In class Case Study activity</b> <b>Exam questions assignment</b>
Week 5: June 20- 24 <sup>th</sup>	Spinal Cord Anatomy and Dermatomes, ascending and descending tracts, reflexes	<b>Chapter 3</b>	<b>Powerpoint slide lecture,</b> <b>In class Active Learning activity</b> <b>In class Case Study activity</b> <b>Exam questions assignment</b>
Week 6: June 27-July 1 <sup>st</sup>	Spinal cord lesions	<b>Chapter 3</b>	<b>Powerpoint slide lecture,</b> <b>In class Active Learning activity</b> <b>In class Case Study activity</b> <b>Exam questions assignment</b>
Week 7: July 4-8 <sup>th</sup>	Spinal cord lesions (cont)	<b>Chapter 3</b>	<b>Powerpoint slide lecture,</b> <b>In class Active Learning activity</b> <b>In class Case Study activity</b> <b>Exam questions assignment</b>

**Required Course Materials:**

Participants will need access to PubMed or other online libraries for radiology content. Also, any A&P text will suffice for background information.

**Neuroradiology: The Essentials with MR and CT** (ISBN 978-1-60406-916-7) by Val Runge is to be purchased or rented. Additional information for this course will be provided on the Google Classroom website.