



The Florida State University
College of Medicine

BMS 6706C

Clinical Neuroscience

Fall 2014

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Instructors

Course Director

Nancy L. Hayes, Ph.D.

Office 2200 G Phone 850-645-9660

Email nancy.hayes@med.fsu.edu

Assistant Course Director

Richard S. Nowakowski, Ph.D.

Office 2370 Phone 850-644-9219

Email richard.nowakowski@med.fsu.edu

Course Faculty

Pradeep Bhide, PhD

Kenneth Brummel-Smith, MD

Debra Danforth, ARNP

Dan Van Durme, MD, MPH

Heather Flynn, PhD

Lisa Granville, MD

Sanjay Kumar, PhD

Eric Laywell, PhD

Karen Myers, ARNP

Curt Stine, MD

Charles G. Maitland, MD

James Olcese, PhD

Charles Ouimet, PhD*

Mike Overton, PhD

Robert Watson, MD

Course Overview

Course Goals

The Clinical Neuroscience is designed according to the principles of how the brain learns. The course philosophy – “What I understand, I remember” – echoes Confucius (“I hear and I forget. I see and I remember. I do and I understand.”) and informs all activities in the course. Students acquire a fundamental knowledge of the human nervous system through exploring and discovering how neuroscience explains the signs and symptoms of common neurological problems. In a similar way, they learn to perform, assess and report the results of the basic neurological screening exam through an “evidence-based” approach. Attention is given to integrating concepts and knowledge from other disciplines and domains of the biopsychosocial approach. Students who complete this course will understand not only the anatomy and physiology of the nervous system in health and disease but will also have a strong appreciation of how the brain determines what we do, why we do it, and who we are. Mastery of these concepts will enable students to localize lesions in the central nervous system based on observed signs, to predict the neurological deficits associated with lesions, to predict the consequences of non-biological factors on the nervous system, and evaluate the results of clinical trials. Our goal is to help our learners achieve long-term acquisition of neuroscience concepts that will allow them to perform as exemplary clinicians long after the course has been completed.

Learning Objectives

Detailed learning objectives are provided for each session in the course.

The global course objectives are:

1. Describe the normal structure and function of the brain and spinal cord in the context of how these structure/function relationships result in observable behaviors.
2. Predict the location and etiology of pathologies in the CNS based on clinical signs and symptoms.
3. Anticipate the deficits expected to result from injury, disease and environmental and social conditions that impact the nervous system.
4. Demonstrate the ability to perform, interpret, and report the results of the neurological screening exam.
5. Demonstrate the habits of life-long learning – the identification of knowledge gaps and application of strategies to find and interpret information to address those gaps.
6. Demonstrate professional behavior in interactions with peers, with guest patients, and with faculty.

Course Format

The course will follow a weekly format that allows content to be introduced, synthesized, applied and assessed. New material will be introduced at the beginning of the week in a “Flipped Classroom” paradigm. At the beginning of each week, students will complete required pre-class preparation assignments that cover basic didactic material. The interactive large group session on the following day will apply and extend that knowledge through clinical case-based inquiry using both case reports from the required text (*Neuroanatomy Through Clinical Cases*) and videoed history and exams of patients with specific neurological signs and symptoms. Application and synthesis of information will take place in small

group problem-solving sessions on Wednesday. Thursdays are “hands-on” learning days – 4 human brain dissection labs and 9 clinical learning sessions. The week concludes with a consolidation day that includes a formative assessment, development of thinking skills through analysis of NBME type questions, and deeper exploration of important topics that flow from earlier in the week. Finally, students are expected to self-assess their learning needs and set goals to address them.

Monday	Tuesday	Wednesday	Thursday	Friday
FLIPPED CLASS	FLIPPED CLASS	Synthesis Large <u>or</u> Small Group	Hands-on learning	Assessment Short answer, video-based, & performance-based questions
Advanced Prep is REQUIRED Usually includes a short Quiz	Advanced Prep is REQUIRED Usually includes a short Quiz	Case studies, application exercises	Wet lab (4) <u>or</u> Neuro Exam & practice (7-8) (Clinical faculty will join us) Some patients*	NBME/ Step 1 Prep (MCQs) “Deep Dive”

Neuroscience Laboratory

There will be 4 scheduled dissection labs during the semester. Attendance at these sessions is voluntary, but encouraged – this is when neuroscience faculty will be available to help you explore and understand the gross specimen. Small groups of students will be “assigned” a brain which they will have the privilege to dissect with experienced faculty guidance. The materials will be available for study outside of scheduled lab time, but you must not cut or otherwise damage the specimen assigned to another group. Whole brains, half brains, and pre-cut brain slabs in all 3 planes of section will also be available at all times throughout the semester. The purpose of the lab is to help students develop a 3-dimensional appreciation of the central nervous system and of the “neighbor” relations between structures that are needed to facilitate clinical problem solving. Whether or not you participate in the lab sessions, you are expected to take full responsibility to learn the material (using atlases, consulting with peers etc.).

Clinical Learning Sessions

Clinical faculty will join us for learning and practice of the neurological exam. Whenever possible, real patients will be present share their stories and demonstrate signs of their neurological disease during these hands-on clinical learning sessions. Whenever patients are present, we ask that you wear your white coats and close your computers and other mobile devices as demonstration of your respect for these wonderful patients who are willing to help us learn. At the end of each Clinical Learning session you will be asked to complete the “Explaining signs with science” grid to solidify your understanding. This should not take you more than 5 minutes!

Large Group Sessions (Flipped Classes)

The goal of the course is to have no formal lectures. Pre-class preparation by students will allow the large group time to be spent in active discussion and consolidation of learning through application exercises. Success depends on student engagement, preparation, and trust in the safe environment we maintain to encourage students to be curious and even to take intellectual risks. At the end of each large group

session you will be expected to complete the “3 major points” grid and save it to your computer. This is an extremely valuable exercise that should be done quickly (don’t over-think it) before you leave the classroom. You may find it difficult at first, but it will quickly pay off by helping you see what’s important and why. When it comes time for exams, these grids will guide your study.

Small Group Jigsaw Sessions (attendance required)

These exercises are designed for **active** learning. Students meet in small groups and each group is assigned a neurological presentation to discuss and form a hypothesis: *Where is the lesion? What may be the cause? What more do we need or want to know?* All members of the group share responsibility for analyzing and explaining the clinical presentation. Then the small groups re-mix such that each member of each new group “owns” a different case, which he/she then “teaches” to the new group. It’s important to focus on how you arrived at your hypothesis and answered your questions. This is hard work, but students in the past have really enjoyed this format. The value of the exercise is not the “answer,” but how you get there. Faculty will be present to ask helpful questions if your group is “stuck” and to encourage your curiosity. During the exercise, you are free to use any resources except the specific cases in the Blumenfeld textbook. At the end of each small group exercise you will be expected to review the complete case in Blumenfeld and create a summary in your own words of the “take home” points of the cases considered as a group. **Summarizing and paraphrasing in your own words is a powerful learning tool.**

Peer evaluation

Midway and at the end of the course, students will be asked to evaluate the other members of their small group anonymously. These evaluations will be shared with the students and serve as a guide to how others see them. Lack of participation in group efforts will get the attention of the faculty who will then work with the student to remediate the problem.

Narrative evaluation

Midway through the course and at the end of the semester, faculty will provide narrative evaluation to the students on his/her performance in small and large groups.

Student-generated question bank

At the beginning of the semester you will be invited to participate in the NeuroMed Wiki <https://neuromed.wikispaces.com/home>, an on-line collaborative project to share high quality, student-generated study materials. This is a great place to share your “3 major points” summaries! Students are also encouraged to write test questions they believe would allow them to demonstrate their understanding of concepts and content from the course. These can be posted to NeuroMed Wiki, where other students can use, edit, and improve the questions (like the Wikipedia!). Questions which integrate content with other courses (Medicine 1, Doctoring 102, Histology and Cell Biology, Health Issues in Medicine 1) are particularly valuable. Help us transform medical education by taking advantage of new ways of learning!

Competencies

FSUCOM – Competencies –Clinical Neuroscience BMS 6706C		
Competency Domains	Competencies Covered in the Course	Methods of Assessment
Patient Care	<p>Perform, interpret and report the results of a neurological screening exam.</p> <p>Demonstrate patient-centered and respectful behaviors to patients who participate in the course.</p>	Faculty observation; OSCE
Medical Knowledge	<p>Explain the underlying neuroscience principles of evaluative tests of nervous system function.</p> <p>Explain the signs and symptoms of common neurological problems based on underlying neuroscience concepts and details.</p> <p>Predict the functional consequence(s) of lesions and diseases affecting the nervous system based on identification of pathology in images or other laboratory tests.</p> <p>Predict the potential consequences of environmental and social factors on the structures and function of the nervous system and on behavior.</p> <p>Hypothesize the location of lesions in the nervous system or disease mechanism based on clinical signs and symptoms.</p> <p>Explain the changes in the nervous system associated with normal and pathological development across the lifespan.</p> <p>Interpret and evaluate the literature on disease mechanisms and emerging therapeutic strategies based on principles of biostatistics, study design, and evidence based medicine.</p>	Formative Quizzes, Block Exams, NBME subject exam. Faculty observation in large group activities and jigsaw exercises
Practice-based Learning	<p>Demonstrate the habits of life-long learning – the identification of personal knowledge gaps and application of strategies to find and interpret information to address those gaps.</p>	Weekly self-assessment, Jigsaw exercises
Communication Skills	<p>Use accurate and appropriate vocabulary and concepts to communicate effectively with peers, patients and faculty about neurological function.</p>	Faculty observation, peer evaluation; free-response questions on quizzes and exams
Professionalism	<p>Complete all required activities in a timely fashion.</p> <p>Maintain confidentiality for patients who participate in the course.</p> <p>Demonstrate professional behavior in all interactions with peers, patients, and faculty.</p>	Weekly assignments; faculty observation; peer and self-evaluation
System-based Practice		

NOTES: Students observe physician-patient encounters when patients are presented to the class and in films of patient/physician encounters. Students are also encouraged to ask their own questions when patients are being interviewed in front of the class.

Policies

Americans with Disabilities Act

Candidates for the M.D. degree must be able to fully and promptly perform the essential functions in each of the following categories: Observation, Communication, Motor, Intellectual, and Behavioral/Social. However, it is recognized that degrees of ability vary widely between individuals. Individuals are encouraged to discuss their disabilities with the College of Medicine's [Director of Student Counseling Services](#) and the FSU Student Disability Resource Center to determine whether they might be eligible to receive accommodations needed in order to train and function effectively as a physician. The Florida State University College of Medicine is committed to enabling its students by any reasonable means or accommodations to complete the course of study leading to the medical degree.

[The Office of Student Counseling Services](#)

Medical Science Research Building
G146

Phone: (850) 645-8256 Fax: (850) 645-9452

This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the:

Student Disability Resource Center
97 Woodward Avenue, South
Florida State University
Tallahassee, FL 32306-4167
Voice: (850) 644-9566
TDD: (850) 644-8504

sdrc@admin.fsu.edu

<http://www.fsu.edu/~staffair/dean/StudentDisability>

Academic Honor Code

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. (Florida State University [Academic Honor Policy](#))

Attendance Policy

The College of Medicine has detailed attendance policies as they relate to each cohort and events that conflict with course schedules. See the [Student Handbook](#) for details of attendance policy, notice of absences and remediation.

Unexcused absence from a scheduled examination may result in a score of zero (0 %) being assigned for that assessment. Unexcused absence from an activity for which attendance is required (for example, Small Group session) may be considered as an issue of Professionalism. Any unexcused absence may require completion of the Performance Improvement Program (see Grading System, below)

Required Materials

1. Neuroanatomy Through Clinical Cases, 2nd edition, Blumenfeld, (Sinauer) – available as a hard copy or an editable electronic book (individual only). It can also be “rented” from Amazon for about \$30 or from the publisher for about \$40 (540 days).
2. Clinical Neuroanatomy, 27th edition, Waxman (available as an ebook from the COM Library) – not a substitute for Blumenfeld!
3. Neuroanatomy, an Atlas of Structures, Sections and Systems, 7th or 8th edition, Haines (available as an ebook from the COM Library) This atlas is far superior to Netter, including because it is a photographic atlas of gross and histological sections as well as MRI and angiography imaging studies.

Suggested Materials

Neuroscience, 5th edition, Purves, et al.

Interactive Neuroscience Learning Modules (Library Course Pages Online Library Resources (<http://resources.med.fsu.edu.ezproxy.med.fsu.edu/neuro/>))

Useful Web sites

<http://www.medlina.com/neuroanatomy.htm> General neurology web sites

<http://www.vh.org/adult/provider/anatomy/BrainAnatomy/BrainAnatomy.html> Brain atlases

<http://www.med.harvard.edu/AANLIB/home.html> The Harvard brain atlas

<http://library.med.utah.edu/kw/hyperbrain/animations/pathways/> Pathway Quizzes in Neuroanatomy

<https://www.msu.edu/~brains/brains/human/index.html> The Human Brain Atlas

<http://meded.ucsd.edu/clinicalmed/neuro3.htm> A Practical Guide to Clinical Medicine: The Neurological Exam

Grading System

Assignments and Grading

FSU COM has adopted a pass/fail grading system which is used in the curriculum for the first and second years (See [Student Handbook](#)). To achieve a grade of Pass in Clinical Neuroscience [BMS 6706C] a student must meet all of the following requirements:

- 1) A final average $\geq 70\%$ on all examinations. An average below 70% will receive a grade of fail which will require remediation or repetition of the course, as determined by decision of the Student Evaluation and Promotion Committee. A student whose performance is below 70% on any exam in the semester is required to
 - Attend the exam review
 - Contact the course director within 24 hours of attending the review.
- 2) A passing grade on the NBME subject exam, as determined by the Course Director.
- 3) Attendance and satisfactory participation in all required sessions, as determined by the Course Director. Unexcused absence from an activity for which attendance is required (for example, small group jigsaw session) may result in a Report of Concern for Unprofessionalism Behavior. Repeated unexcused absences may result in receiving a grade of Fail for the course.
- 4) Satisfactory completion of all Pre-class Preparation Assignments, as determined by the Course Director. Pre-class Preparation Assignments are formative (i.e., do not contribute to the final grade) but must be completed **on time** and with **evidence of reasonable effort**.
- 5) Satisfactory completion of all additional required assignments, as determined by the Course Director.
- 6) Demonstration of the attitudes and behaviors of Medical Professionalism in all aspects of the course.

Examinations

There will be 3 integrated block exams which include content from all Year 1 Fall semester courses. **Neuroscience items on each exam will include both “board-type” multiple choice format questions and short answer/free response questions** similar to those you will have been doing in class. Both will emphasize problem solving and application of concepts, rather than rote memory. Many questions will be based on or include images and clinical vignettes. Some may be based on video clips. The course endorses a criterion-referenced teaching philosophy in which exams test the specific ideas that all students are expected to master (criteria), rather than a norm-referenced approach that rank orders student performance. Thus, there is no reason for students to feel competitive with one other. On the contrary, higher achievement can be expected when students work cooperatively. Expectations are defined in the Learning Objectives for each session, and students will have daily and weekly practice responding to the types of questions they will see on the Exams. While all students are expected to pass

each exam with a score $\geq 70\%$, we encourage you to aspire to mastery (100%) of the material and will do everything we can to help you achieve scores of 80% or higher.

At the end of the semester, students will take the NBME subject exam in Neuroscience. Students should be aware that because Neuroscience is taught as late as Year 2 in some medical schools, this exam covers related content they will not yet have studied (e.g., physiology, pathophysiology and pharmacology). Be confident that the course director takes that into account when determining the “passing” performance level. In addition, each Friday during the semester we will spend some time analyzing a few of these NBME/USMLE Step 1 questions to develop your skill and comfort level. It’s important that you take this exam seriously and strive for your best performance. This is your opportunity to assess your overall knowledge against USMLE content. The FSU COM clerkship grading policy requires students to score no less than the 10th percentile on NBME subject exams to achieve a grade of Pass in a clerkship. In the Clinical Neuroscience course, a score below the 10th percentile on the NBME exam will be considered in the context the individual student’s overall performance in the course. For example, an NBME score at the 4th percentile coupled with marginal block exam scores (e.g., 70, 71, 70) and/or failure (<70%) of any block exam(s) could result in a course grade of Fail on the basis of failure to demonstrate minimal knowledge standards.