Introduction to Clinical Neuroanatomy  
University of Florida  
College of Public Health & Health Professions Syllabus  
Course Number: HSC 4930, Class 23946, Section 121H (2 credits)  
OTH 4418L – Lab, Class 23172 (Section 15H0), 24174 (Section 15HH) (2 credits)  
Fall 2019  
Delivery Format: On-Campus  
Course Website available on Canvas

Instructor Name: Jared Tanner, Ph.D.  
Phone Number: 278-5928  
Email Address: jjtanner@phhp.ufl.edu  
Office: Shands DG-86  
Office Hours: Thursdays 1 – 3 or by appointment (preferred)  
Teaching Assistants  
• Elena Polejaeva, M.S. (polejaeva@ufl.edu)  
• Furtuna Tewolde, M.S. (furtuna.tewolde@ufl.edu)  
Preferred Course Communications: Email or through Canvas  
Lecture Room: C1-11  
Lab Room: CG-22

Prerequisites  
Anatomy and physiology or instructor approval

PURPOSE AND OUTCOME

Course Overview  
The purpose of this course is to provide the student with lecture and laboratory study of the human nervous system. This introductory course is designed for health science students and is focused on pertinent material including neuroanatomy, neurophysiology, and disorders of the human nervous system. Emphasis is put on the relationship between structure and function in the central nervous system with focus on higher cortical function and anatomy. A key goal of this course is to provide students with introductory knowledge for engaging in basic clinical problem-solving, by applying neurophysiological and neuroanatomical principles to case studies of neurological disorders.

Relation to Program Outcomes  
This course is an elective course for BHS students. It is particularly relevant for any students planning on attending medical school or receiving additional health science education.
Course Objectives and/or Goals

The student will:

- Demonstrate knowledge and understanding of the structure and function of the human central nervous system. Course content includes – but is not limited to – anatomy, neuroscience, and cognitive science.

More specifically, based on study materials, readings, lectures, and handouts the student will:

A. Lecture (neuroanatomy and integrating structure & function)

1. Describe basic concepts, terminology, and divisions of the central nervous system.
2. Describe the organization, structure and function of the cerebrum, diencephalon, limbic structures, basal ganglia, cerebellum, brain stem, cranial nerves, and spinal cord.
3. Define terms and describe basic cytology of the nervous system.
4. Define terms and describe conduction and transmission of nerve impulse as well as excitation and inhibition.
5. Trace and describe the flow of blood and cerebrospinal fluid of the brain and spinal cord.
6. Define terms and describe lifespan neuroanatomical development.
7. Identify structures and describe the organization and function of sensory systems including the somatosensory, vestibular, visual, and auditory systems.
8. Identify structures and describe the organization and function of the motor systems and the control of posture and movement.
9. Identify structures and describe the organization and function of the autonomic nervous system and the limbic system.
10. Integrate the information of structure and function as well as dysfunction of the central nervous system by applying knowledge of brain anatomy to functions in the various areas and lobes and infer the disorders related to various neurological features.

B. Brain (neuroanatomy) lab

1. Identify basic structure and function of the brain and spinal cord
2. Identify structures and describe their functions including: the meninges, cerebrum, diencephalon, cerebellum, brain stem & cranial nerves, and spinal cord.
3. Identity vascular and ventricular structures, trace blood and CSF flow in the brain and spinal cord.
4. Describe the etiology, symptoms, signs and treatment of major neurological diseases, disorders, and dysfunctions.
5. Relate specific functions and/or disorders to the neuroanatomical structures studied in the brain labs.
6. Compare and contrast between different lesions based on their location in the brain.
**Instructional Methods**

The students will participate in lecture and in laboratory study of specimen and models as well as case studies of neurological disorders. The course involves a mixture of hands-on gross anatomy laboratory experience and active learning during lecture.

**What is expected of you?**

You are expected to actively engage in the course throughout the semester. You must come to class prepared by completing any out-of-class assignments. Completing the readings before class is strongly encouraged. This preparation gives you the knowledge or practice needed to engage in higher levels of learning during the class sessions. If you are not prepared for the face-to-face sessions, you may struggle to keep pace with the class activities, and it is unlikely that you will reach the higher learning goals of the course. Similarly, you are expected to actively participate in the class. Your participation fosters a rich course experience for you and your peers that facilitates overall mastery of the course objectives.

**DESCRIPTION OF COURSE CONTENT**

**Topical Outline/Course Schedule**

<table>
<thead>
<tr>
<th>Week</th>
<th>Date(s)</th>
<th>Topic(s)</th>
<th>Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aug 21*</td>
<td>Neuroanatomy overview and basic definitions</td>
<td>Blumenfeld Chapter 2</td>
</tr>
<tr>
<td>2</td>
<td>Aug 28</td>
<td>Introduction to Clinical Neuroradiology</td>
<td>Blumenfeld Chapter 4</td>
</tr>
<tr>
<td>3</td>
<td>Sep 4*</td>
<td>Brain and Environs: Cranium, Ventricles, and Meninges</td>
<td>Blumenfeld Chapter 5</td>
</tr>
<tr>
<td>4</td>
<td>Sep 11</td>
<td>Cerebral Hemispheres and Vascular Supply</td>
<td>Blumenfeld Chapter 10</td>
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<tr>
<td>5</td>
<td>Sep 18</td>
<td><strong>In-class Test 1 – Coronal Brain</strong> Brainstem: Surface Anatomy and Cranial Nerves</td>
<td>Blumenfeld Chapter 12</td>
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<tr>
<td>6</td>
<td>Sep 25</td>
<td>Brainstem II: Internal Structures and Vascular Supply</td>
<td>Blumenfeld Chapter 14</td>
</tr>
<tr>
<td>7</td>
<td>Oct 2</td>
<td>Cerebellum</td>
<td>Blumenfeld Chapter 15</td>
</tr>
<tr>
<td>8</td>
<td>Oct 9</td>
<td>Corticospinal Tract and other motor pathways</td>
<td>Blumenfeld Chapter 6</td>
</tr>
<tr>
<td>9</td>
<td>Oct 16</td>
<td>Somatosensory Pathways</td>
<td>Blumenfeld Chapter 7</td>
</tr>
<tr>
<td>10</td>
<td>Oct 23</td>
<td><strong>Lab Pin Test (Oct 21)</strong> Visual System</td>
<td>Blumenfeld Chapter 11</td>
</tr>
<tr>
<td>11</td>
<td>Oct 30</td>
<td>Basal Ganglia</td>
<td>Blumenfeld Chapter 16</td>
</tr>
<tr>
<td>12</td>
<td>Nov 6</td>
<td>Limbic System: Emotion and Memory</td>
<td>Blumenfeld Chapter 18</td>
</tr>
<tr>
<td>13</td>
<td>Nov 13*</td>
<td>Higher Cortical Function: Neuroanatomy of Language</td>
<td>Blumenfeld Chapter 19</td>
</tr>
<tr>
<td>Week</td>
<td>Date(s)</td>
<td>Topic(s)</td>
<td>Readings</td>
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<tr>
<td>14</td>
<td>Nov 20</td>
<td>Higher Cortical Function: Neuroanatomy of Executive Function</td>
<td>Blumenfeld Chapter 19</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td><strong>No lab or lecture – Happy Thanksgiving!</strong></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Dec 4</td>
<td>Lab Network Lesion Assignment Due Monday December 2 at 10:00 PM Neuroanatomy Across the Lifespan</td>
<td>No reading (Reference Chapter 2)</td>
</tr>
<tr>
<td>Final</td>
<td>Dec 12</td>
<td><strong>Cumulative Final Exam</strong></td>
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</tbody>
</table>

*No lab. Note about readings: Some of the chapters are long (but they typically have a lot of pictures and tables). Specific pages and/or sections ranges from chapters you are asked to read will be posted on Canvas. In many cases you will not be required to read the entire chapter.*

**Course Materials and Technology**


**Nitrile, latex, or vinyl gloves are required during labs** (nitrile are recommended). **Please provide your own.** If you have financial limitations that prevent you purchasing gloves for the semester (cost is typically $10 or less for a box of 100), please talk with your instructor. You can also split the cost with other students. You will need about 15 pairs of gloves for the semester (this allows for a couple extra sets if any rip or are defective).

For technical support for this class, please contact the UF Help Desk at:
- Learning-support@ufl.edu
- (352) 392-HELP - select option 2
- https://lss.at.ufl.edu/help.shtml

**ACADEMIC REQUIREMENTS AND GRADING**

**Quizzes**

Quizzes will be held most weeks there is a lecture. They will be taken on Canvas and available for 3 days after lecture. They will be 10-15 questions and be comprised of multiple choice, fill in the blank, and true/false questions. Short answers could be a possibility. You will have no more than 25 minutes to take each quiz (students who need accommodations should contact the instructor). You should not use notes, internet resources, other people, books, textbooks, or other sources during the quizzes. We will use the honor system for the quizzes, following the Honor Code: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” If you have any technical difficulties with the quizzes, please contact your instructor.

**Exams**

*Exam 1* will be completed during class on September 18, 2019. It will consist of simple drawing and fill-in-the-blank. You are **not judged on drawing ability. Exam 2** is comprised of the Lab Pin Test. This will be held on Monday, October 21 during your normal laboratory
It will be a fill-in-the-blank test comprising up to 60 items. The final exam will be held during the assigned finals spot and will be held in a Communicore classroom. It will be comprehensive. The format and content will be similar to the quizzes.

Assignment
Lab Assignment. From a given list of regions/networks and/or disorders or dysfunctions, pick one region/network and write a 3-page paper on its general functions. Students must include a case example with a lesion to demonstrate how damage or dysfunction to the region and network affects behavior. A rubric and more details will be available during the semester on Canvas. Submission will be online through Canvas.

1. Describe major components of the system/tract/network.
2. Describe specific function(s) of the structures and network.
3. Describe deficits or disorders associated with damage or dysfunction to the system. These could be lesions (e.g., stroke, pathology).
4. If relevant, provide a brief discussion of neurotransmitters of the system.
5. Make up your own or include a case example with presentation of symptoms, location of lesion/damage.

Grading

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Due date</th>
<th>% of final grade</th>
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<tbody>
<tr>
<td>Test 1 – Coronal Brain</td>
<td>Sep 18, 2019</td>
<td>15% of final grade</td>
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<tr>
<td>Lab Pin Test</td>
<td>Oct 21, 2019</td>
<td>25% of final grade</td>
</tr>
<tr>
<td>Lab Network Lesion Assignment</td>
<td>Dec 2, 2019</td>
<td>15% of final grade</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Dec 12, 2019</td>
<td>25% of final grade</td>
</tr>
<tr>
<td>Weekly quizzes (weeks 2-16)</td>
<td>Dec 4, 2019</td>
<td>20% of final grade</td>
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Point system used

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<tr>
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<th>93-100</th>
<th>90-92</th>
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<th>80-82</th>
<th>77-79</th>
<th>73-76</th>
<th>70-72</th>
<th>67-69</th>
<th>63-66</th>
<th>60-62</th>
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<tbody>
<tr>
<td>Letter Grade</td>
<td>A</td>
<td>A-</td>
<td>B+</td>
<td>B</td>
<td>B-</td>
<td>C+</td>
<td>C</td>
<td>C-</td>
<td>D+</td>
<td>D</td>
<td>D-</td>
<td>E</td>
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Please be aware that the Bachelor of Health Science and Bachelor of Public Health Programs do not use C- grades.

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>A</th>
<th>A-</th>
<th>B+</th>
<th>B</th>
<th>B-</th>
<th>C+</th>
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<tr>
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</table>
More information on UF grading policy may be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Exam Policy

Policy Related to Make up Exams or Other Work

Make-up exams or quizzes will be available with pre-arrangement or verification of illness from a physician. Please note: Any requests for make-ups due to technical issues MUST be accompanied by the UF Computing help desk (http://helpdesk.ufl.edu/) correspondence. You MUST e-mail me within 24 hours of the technical difficulty if you wish to request a make-up.

Policy Related to Required Class Attendance

You are expected to attend lecture and lab. Attendance will not be taken or graded but you will be at a significant disadvantage if you do not attend lecture and lab. This class follows the UF policy for excused absences. For information regarding the UF Attendance Policy see the Registrar website for additional details:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

STUDENT EXPECTATIONS, ROLES, AND OPPORTUNITIES FOR INPUT

Expectations Regarding Course Behavior and Communication

All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. You are expected to interact respectfully and courteously with other students and the instructor. Course communication should be civilized and respectful to everyone. The means of communication provided to you through eLearning (e-mail, discussion posts, course questions, and chats) are at your full disposal to use in a respectful manner.

Abuse of this system and its tools through disruptive conduct, harassment, or overall disruption of course activity will not be tolerated. Conduct that is deemed to be in violation with University rules and regulations or the Code of Student Conduct will result in a report to the dean of students.

Refer to the Netiquette Guide for Online Courses for more information.

Specific Behavior in Lab
Preparation for Lab: **It is your responsibility to bring nitrile or latex gloves for use in lab.** There will be some backup gloves available but in limited quantities. Gloves can be purchased online in bulk for a modest fee. If you have financial limitations that prevent you purchasing gloves, please talk with your instructor. Some labs might have online material to review beforehand. This will be posted on Canvas.

Lab attire: Students must wear close toed shoes (no sandals) and wear clothing that they are comfortable potentially getting splashes on. Please bring your gloves to class (they should not be reused). Wooden robes will be provided.

Use of laboratory materials: Neural specimens are very fragile and must be handled with care. Specimen must not be allowed to dry out. Wet a paper towel with water to cover parts of specimen when out of the buckets for an extended period of time. Do not poke the specimen with a pencil or pen! Gently touch with a wooden probe.

Lab clean-up: Students are expected to clean up after themselves in lab and return all lab materials to their proper place. Students are not to remove atlases, models, specimen or other lab materials from the classroom.

**Academic Integrity**

Students are expected to act in accordance with the University of Florida policy on academic integrity. As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge:

“We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.”

You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied:

“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”

It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For additional information regarding Academic Integrity, please see Student Conduct and Honor Code or the Graduate Student Website for additional details: https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/

Please remember cheating, lying, misrepresentation, or plagiarism in any form is unacceptable and inexcusable behavior.

**Online Faculty Course Evaluation Process**
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at [https://gatorevals.aa.ufl.edu/students/](https://gatorevals.aa.ufl.edu/students/). Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via [https://ufl.bluera.com/ufl/](https://ufl.bluera.com/ufl/). Summaries of course evaluation results are available to students at [https://gatorevals.aa.ufl.edu/public-results/](https://gatorevals.aa.ufl.edu/public-results/).

**Policy Related to Guests Attending Class**
Only registered students are permitted to attend class. However, we recognize that students who are caretakers may face occasional unexpected challenges creating attendance barriers. Therefore, by exception, a department chair or his or her designee (e.g., instructors) may grant a student permission to bring a guest(s) for a total of two class sessions per semester. This is two sessions total across all courses. No further extensions will be granted. *Please note that guests are not permitted to attend either cadaver or wet labs.* Students are responsible for course material regardless of attendance. For additional information, please review the Classroom Guests of Students policy in its entirety. Link to full policy: [http://facstaff.phhp.ufl.edu/services/resourceguide/getstarted.htm](http://facstaff.phhp.ufl.edu/services/resourceguide/getstarted.htm)

**SUPPORT SERVICES**

**Accommodations for Students with Disabilities**
Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting [https://disability.ufl.edu/students/get-started/](https://disability.ufl.edu/students/get-started/). *It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.*

**Counseling and Student Health**
Students sometimes experience stress from academic expectations and/or personal and interpersonal issues that may interfere with their academic performance. If you find yourself facing issues that have the potential to or are already negatively affecting your coursework, you are encouraged to talk with an instructor and/or seek help through University resources available to you.

- The Counseling and Wellness Center 352-392-1575 offers a variety of support services such as psychological assessment and intervention and assistance for math and test anxiety. Visit their web site for more information: [http://www.counseling.ufl.edu](http://www.counseling.ufl.edu). On line and in person assistance is available.
- You Matter We Care website: [http://www.umatter.ufl.edu/](http://www.umatter.ufl.edu/). If you are feeling overwhelmed or stressed, you can reach out for help through the You Matter We Care website, which is staffed by Dean of Students and Counseling Center personnel.
The Student Health Care Center at Shands is a satellite clinic of the main Student Health Care Center located on Fletcher Drive on campus. Student Health at Shands offers a variety of clinical services. The clinic is located on the second floor of the Dental Tower in the Health Science Center. For more information, contact the clinic at 392-0627 or check out the web site at: https://shcc.ufl.edu/

• Crisis intervention is always available 24/7 from: Alachua County Crisis Center:
  (352) 264-6789
  http://www.alachuacounty.us/DEPTS/CSS/CRISISCENTER/Pages/CrisisCenter.asp

Do not wait until you reach a crisis to come in and talk with us. We have helped many students through stressful situations impacting their academic performance. You are not alone so do not be afraid to ask for assistance.

Inclusive Learning Environment
Public health and health professions are based on the belief in human dignity and on respect for the individual. As we share our personal beliefs inside or outside of the classroom, it is always with the understanding that we value and respect diversity of background, experience, and opinion, where every individual feels valued. We believe in, and promote, openness and tolerance of differences in ethnicity and culture, and we respect differing personal, spiritual, religious, and political values. We further believe that celebrating such diversity enriches the quality of the educational experiences we provide our students and enhances our own personal and professional relationships. We embrace The University of Florida’s Non-Discrimination Policy, which reads, “The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans’ Readjustment Assistance Act.” If you have questions or concerns about your rights and responsibilities for inclusive learning environment, please see your instructor or refer to the Office of Multicultural & Diversity Affairs website: www.multicultural.ufl.edu

Disclaimer
This syllabus represents my current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.

Last update: January 15, 2020