

**Clinical and Functional Neuroanatomy**  
**University of Florida**  
**College of Public Health & Health Professions Syllabus**  
**Course Number: CLP 7934 – Lecture (2 credits) and Lab (2 credits)**  
Fall 2022  
Delivery Format: On-Campus  
Course Website available on Canvas

**Instructor:** Jared Tanner, Ph.D.

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**Email:** [jjtanner@phhp.ufl.edu](mailto:jjtanner@phhp.ufl.edu)

**Office Hours:** Thursdays 12:00 – 2:00 by appointment (please schedule at least 2 days in advance):

<https://outlook.office365.com/owa/calendar/TannerOfficeHours@uflorida.onmicrosoft.com/bookings/>

**Preferred Course Communications:** Email or Canvas

**Lecture Room:** HPNP G105 / MBI L2-100R

**Lab Room:** Shands/Communicore CG-22

### **Prerequisites**

Instructor and mentor approval

## **PURPOSE AND OUTCOME**

### **Course Overview**

The purpose of this course is to provide the student with lecture and laboratory study of the human central 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.

### **Relation to Program Outcomes**

This course is required course for Clinical and Health Psychology students who are in the neuropsychology or Cognitive-Emotion Neuroscience tracks.

## **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, 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.
11. Cover function of the central nervous system with consideration of diversity and underrepresented minority groups.

### **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, brainstem & cranial nerves, and spinal cord.
3. Identify 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 different lesions based on their location in the brain.

### **Instructional Methods**

The students will participate in lectures and in laboratory study of specimens and models as well as case studies of neurological disorders. The course involves a mixture of active learning gross anatomy laboratory experience and lecture. The lab will consist of live demonstrations with physical and virtual brain samples. Supplemental virtual material will also be used to enhance learning. Lectures will be in-person for 50 minutes with additional materials provided to be viewed before in-person class. A HyFlex option for lectures can be made available upon request. Contact your instructor if you have concerns about attending in-person labs. There might be options for virtual attendance.

### **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, including reviewing recorded lecture material. 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

Note that weeks are defined from the first day of class.

Week	Date(s)	Topic(s)	Readings (encouraged)
1	8/28	Lab 1: Overview	BCN Chapter 4 NTCC Chapter 2
	8/29	Neuroanatomy overview and basic definitions	
2	9/4	No lab – Labor Day	BCN Chapters 1 & 22-23 NTCC Chapter 5
	9/5	Brain and Environs: Cranium, Ventricles, and Meninges	
3	9/11	Lab 2	NTCC Chapter 10
	9/12	Cerebral Hemispheres and Vascular Supply	
4	9/18	Lab 3	BCN Chapters 3 & 21 NTCC Chapter 12
	9/19	<b>Test 1 – Coronal Brain</b> Brainstem: Surface Anatomy and Cranial Nerves	
5	9/25	Lab 4	NTCC Chapter 14
	9/26	Brainstem II: Internal Structures and Vascular Supply	
6	10/2	Lab 5	BCN Chapter 9 NTCC Chapter 15
	10/3	Cerebellum	
7	10/9	Lab 6 (Review)	BCN Chapters 5 & 6 NTCC Chapter 6
	10/10	Corticospinal Tract and other motor pathways	
8	10/16	<b>Lab 7: Test 2 – Pin Test</b>	BCN Chapter 11 NTCC Chapter 7
	10/17	Somatosensory Pathways	
9	10/23	Lab 8	BCN Chapter 14 NTCC Chapter 11
	10/24	Visual System	
10	10/30	Lab 9	BCN Chapter 8 NTCC Chapter 16
	10/31	Basal Ganglia	
11	11/6	Lab 10	BCN Chapter 17 NTCC Chapter 18
	11/7	Limbic System: Emotion and Memory	
12	11/13	Lab 11	BCN Chapter 16 NTCC Chapter 19
	11/14	Higher Cortical Function: Neuroanatomy of Language	
13	11/20	No lab – Thanksgiving	
	11/21	No lecture – Thanksgiving	
14	11/27	<b>Lab 12: Test 3 – Lesion Test</b>	NTCC Chapter 19
	11/28	Higher Cortical Function: Neuroanatomy of Executive Function	
15	12/4	Lab 13	
	12/5	Final Class	
Final	During Finals week	Final Exams	

**No lab/lecture.** Note about readings: **No readings are required.** Readings will provide supporting information to what we cover in class. BCN = Basic Clinical Neuroscience. NTCC = Neuroanatomy through clinical cases.

### Course Materials and Technology

Required: Blumenfeld, H. (2021). *Neuroanatomy through clinical cases* (3<sup>rd</sup> ed.). Sunderland, MA: Sinauer Associates, Inc. Publishers. (2<sup>nd</sup> edition also will work)

Optional (this is geared more towards undergraduate students, but it is well-written and a good secondary source if you happen to love neuroanatomy books); Tolbert, D. L., Young, P. A., Young, P. H. (2015). *Basic Clinical Neuroscience* (3<sup>rd</sup> Edition). United Kingdom: Wolters Kluwer.

**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 extra sets if any rip or are defective).

For technical support for this class, please contact the UF Help Desk at:

- [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu)
- (352) 392-HELP - select option 2
- <https://helpdesk.ufl.edu/>

### Additional Academic Resources

[Career Connections Center](#): Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

[Library Support](#): Various ways to receive assistance with respect to using the libraries or finding resources.

[Teaching Center](#): Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

[Writing Studio](#): 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: [Visit the Student Honor Code and Student Conduct Code webpage for more information.](#)

On-Line Students Complaints: [View the Distance Learning Student Complaint Process.](#)

## ACADEMIC REQUIREMENTS AND GRADING

### Quizzes

There are 13 quizzes throughout the semester. They will be taken on Canvas and available for 6 days after lecture. They will be 10-15 questions and be comprised of multiple choice, fill in the blank, true/false, and short answers. The quizzes together comprise 15% of your grade with the lowest grade dropped. You will have no more than 25 minutes to take each quiz (students who need accommodation 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

Examinations will be in-person and on Canvas.

**Exam 1** will be completed **during class** on the date in the calendar of events. It is worth 10% of your grade and will consist of drawing and labelling an image of the brain. *You are not graded on drawing ability.* You will have no more than 20 minutes to complete the exam. Students requiring accommodation need to contact the instructor at least one week before the examination.

**Exam 2** is the Lab Pin Test and is worth 30% of your grade. This will be held in person during your lab time as shown in the calendar of events. It will be a fill-in-the-blank test comprising about 100 items. You will have no more than 50 minutes to complete the exam (30 seconds per item). Students requiring accommodation need to contact the instructor at least two weeks before the examination.

**Exam 3** will be a case conceptualization/name-the-lesion activity modeled after Blumenfeld case presentations and/or ABPP written examinations. It will be multiple choice and short answer and will be held during lab on the date in the calendar. This exam is worth 20% of your final grade.

**Final exam** consists of two separate components. Each part independent and scored separately from the other and worth 12.5% of your grade. It is taken on Canvas between December 11 – 14. The exams are comprehensive with a format and content like the quizzes. You will have one hour to take each part of the exam. Students requiring accommodation need to contact the instructor at least two weeks before the examination.

## Grading

Requirement	Due date	% of final grade
<b>Exam 1: Coronal Brain</b>	Sep 19	10% of final grade
<b>Exam 2: Lab Pin Test</b>	Oct 16	30% of final grade
<b>Exam 3: Case Conceptualization/Name the Lesion</b>	Nov 27	20% of final grade
<b>Final Exam A</b>	Dec 11 – 14	12.5% of final grade
<b>Final Exam B</b>	Dec 11 – 14	12.5% of final grade
<b>Weekly quizzes (weeks 2-16)</b>	Dec 6	15% of final grade

### Point system used

Points earned	93-100	90-92	87-89	83-86	80-82	77-79	73-76	70-72	67-69	63-66	60-62	Below 60
Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E

Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E	WF	I	NG	S-U
Grade Points	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.33	1.0	0.67	0.0	0.0	0.0	0.0	0.0

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 lectures and labs. Attendance will not be taken or graded but you will be at a **significant disadvantage** if you do not attend lectures and labs. 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

### 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 probes 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. 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.

### 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.

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

## **Professionalism and COVID**

As students pursuing a path in the health professions or public health, it is crucial to demonstrate professional behaviors that reflect integrity and commitment to the health of patients, fellow health professionals, and to populations we serve. To accomplish this, a strong responsibility for the well-being of others must be evident in our decisions, along with accountability for our actions. Professionalism in the health disciplines requires adherence to high standards of conduct that begin long before graduation. This is particularly true during times of health emergencies such as the COVID pandemic, given our professional habits can have a direct impact upon the health of persons entrusted to us.

If you are not vaccinated, get vaccinated. Vaccines are readily available at no cost and have been demonstrated to be safe and effective against the COVID-19 virus. Visit this link for details on where to get your shot, including options that do not require an appointment:

<https://coronavirus.ufhealth.org/vaccinations/vaccine-availability/>. Students who receive the first dose of the vaccine somewhere off-campus and/or outside of Gainesville can still receive their second dose on campus.

In response to COVID-19, the following professional practices are in place to maintain your learning environment, to enhance the safety of our in-classroom interactions, and to protect the health and safety of ourselves, our patients, our neighbors, and our loved ones.

- You are required to wear approved face coverings at all times while in Health Science Center classrooms and within Health Science Center buildings even if you are vaccinated.
- If you are sick, stay home and self-quarantine. Please visit the UF Health Screen, Test & Protect website about next steps, retake the questionnaire and schedule your test for no sooner than 24 hours after your symptoms began. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 (or email [covid@shcc.ufl.edu](mailto:covid@shcc.ufl.edu)) to be evaluated for testing and to receive further instructions about returning to campus. UF Health Screen, Test & Protect offers guidance when you are sick, have been exposed to someone who has tested positive or have tested positive yourself. Visit the UF Health Screen, Test & Protect website for more information.
- Continue to follow healthy habits, including best practices like frequent hand washing.
- Avoid crowded places (including gatherings/parties with more than 10 people)

Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class. Hand sanitizing stations will be located in every classroom.

Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work. If you are withheld from campus by the Department of Health through

Screen, Test & Protect you are not permitted to use any on campus facilities. Students attempting to attend campus activities when withheld from campus will be referred to the Dean of Students Office.

Continue to regularly visit [coronavirus.UFHealth.org](https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html) and [coronavirus.ufl.edu](https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html) for up-to-date information about COVID-19 and vaccination.

### **COVID-19 Symptoms**

See <https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html> for information about COVID-19 symptoms, which may include fever, cough, shortness of breath or difficulty breathing, fatigue, chills, muscle or body aches, headache, sore throat, congestion or runny nose, nausea or vomiting, diarrhea, and loss of taste or smell.

### **Recording Within the Course:**

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

### **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/>. 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/>. Summaries of course evaluation results are available to students at <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>

## **SUPPORT SERVICES**

### **Accommodations for Students with Disabilities**

If you require classroom accommodation because of a disability, it is strongly recommended you register with the Dean of Students Office <http://www.dso.ufl.edu> within the first week of class or as soon as you believe you might be eligible for accommodations. The Dean of Students Office will provide documentation of accommodations to you, which you must then give to me as the instructor of the course to receive accommodations. Please do this as soon as possible after you receive the letter. Students with disabilities should follow this procedure as early as possible in the semester. The College is committed to providing reasonable accommodations to assist students in their coursework.

### **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>. Online and in person assistance is available.
- You Matter We Care website: <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.aspx>

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](http://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: August 18, 2023