

PSB 4504 Developmental Neuroscience

Spring 2025

Section #DEV1; Class #26963

class time: Monday, Wednesday, and Friday period 3, 9:35 – 10:25 a.m.

room: Black Hall (BLK) room 0315

3 credits

In this course, we will examine the intricate choreography that underlies the development of vertebrate nervous systems. We will explore the origins of the central and peripheral nervous systems in the developing embryo and fetus. We will examine the complex interactions between gene expression and biochemical signaling in the induction, migration, and patterning of neurons and glial cells in the brain and body. We will examine epigenetic factors in differentiation of progenitors into mature neural cell types, and the role of apoptosis in development and neurodegeneration. We will also explore synaptic formation in the central and peripheral nervous systems, and the impact of environmental experience in strengthening and pruning of connections. All of this will be coordinated with analyses of the ways in which nervous system development is reflected in childhood behavior. If time permits, we may also examine the causes and consequences of neurodevelopmental errors.

Professor: Darragh P. Devine, Ph.D.

dpdevine@ufl.edu

phone: 352-273-2174

office hours: Wednesday 1:55 - 2:45 p.m. and Friday 10:40 - 11:30 a.m. (or by appointment)

Wednesday office hours in-person in the Psychology Building, room PSY 337

Friday office hours are online at: Meeting ID: 913 0886 9852, Passcode: PSB4504

Required Text: *Developmental Neurobiology*, 1st ed. (2024), by Lynne M. Bianchi (ISBN # 978-0815344827)

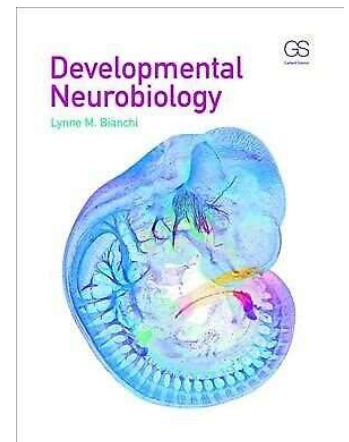
COURSE COMMUNICATIONS: If students have questions about the website, general course content, or other online materials, they should consult the syllabus and the supporting materials in the START HERE module on the Canvas website.

Dr. Devine will be available to answer questions during office hours, or through e-mail. Any e-mailed questions will be answered within approximately 24-48 hours (questions on the weekend may wait until the beginning of the following week).

PREREQUISITE KNOWLEDGE and SKILLS: Students are required to successfully complete Behavioral Neuroscience (PSB3340 or equivalent prior to registering for this course. Fundamental knowledge in Introductory Psychology (e.g. PSY2012) is helpful, but not required. The course is self-contained - meaning that everything you need is contained within the course materials. Accordingly, this course is appropriate for students who have a broad interest in Developmental Psychology and the neurobiological basis of behaviour.

ATTENDANCE POLICY: Students are expected to attend all classes, and frankly, absence from classes will cause a student to miss information that will be tested on the exams. Requirements for class attendance and make-up exams, and other work in the course are consistent with university policies. [See UF Academic Regulations and Policies for more information regarding the University Attendance Policies.](#)

This course complies with all UF academic policies. For information on those policies and for resources for students, please see [this link](#).



COURSE OBJECTIVES: The purpose of this course is to provide a broad foundation in Developmental Neuroscience. Lectures and reading material will emphasize the cellular and molecular biology, anatomy, physiology, and development of the nervous system. The relationship between the biology and behavior of the developing organism will be emphasized. The course is formulated primarily for senior undergraduate students in the Behavioral and Cognitive Neuroscience Program, and for students who identify as pre-Health or other biological or biomedical sciences.

The textbook provides adequate coverage of all these topics and some additional topics. Additional assigned readings will provide updated and more nuanced information about the topics we will cover. Those readings will be posted on the course website [note, the reading load will be demanding during some portions of the course, and I strongly suggest that you read ahead of class meetings - so plan accordingly].

EXAMINATIONS and GRADING: This course will have three take-home exams and one optional final exam. Each take-home exam will consist of a combination of multiple choice and short essay questions. Each of the first three take-home exams will cover only the text and lecture material from the chapters that have most recently been discussed in class (i.e. exam 1 will cover material from the beginning of the course up to the time of the exam; exam 2 will cover material assigned after exam 1; and exam 3 will cover material assigned after exam 2). The final exam will be comprehensive (i.e. all the chapters that are covered during the semester). Students will receive a grade based upon the exams.

Each of the take-home exams will count 33⅓% toward your final grade. If you perform adequately on all take-home exams and are satisfied with your grade, you may skip the final exam. If you fail to turn in a take-home exam, or if you do poorly on an exam, you can drop that exam/grade and take the final exam to replace it. In this case your three *best* exam scores will each count 33⅓% of your total grade.

A penalty of 10% per day will be imposed for any examination that is turned in late.

The grading scheme is as follows:

Score (%)	Grade	Grade Points	Score (%)	Grade	Grade Points
93-100	A	4.00	73-76	C	2.00
90-92	A-	3.67	70-72	C-	1.67
87-89	B+	3.33	67-69	D+	1.33
83-86	B	3.00	63-66	D	1.00
80-82	B-	2.67	60-62	D-	0.67
77-79	C+	2.33	<60	E	0.00

A minimum grade of C is required for General Education (Biological Science) credit.

Additional information on current UF policies for assigning grade points can be found at <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/> .

COURSE SCHEDULE:

For critical semester dates see <http://www.registrar.ufl.edu>

This schedule is ambitious. It will likely be modified during the semester.

Approx. Dates

Chapter and Topic

Aug 22 - Sept 5 Chapter 1: An Introduction to the Field of Developmental Neurobiology

Sept 1 **Labor Day – no classes**

Sept 8 - 15 Chapter 2: Neural Induction

Sept 17 - 24 Chapter 3: Segmentation of the Anterior-Posterior Axis

Sept 26 - Oct 3 Chapter 4: Patterning Along the Dorsal-Ventral Axis

Take-home exam #1: Ch. 1-4, and all material from lectures (available Oct 3, due Oct 10, 11:59 p.m.)

Oct 6 - 13 Chapter 5: Proliferation and Migration of Neurons

Oct 15 - 22 Chapter 6: Cell Determination and Early Differentiation

Oct 17 - 18 **Homecoming – no classes**

Oct 24 - 31 Chapter 7: Neurite Outgrowth, Axonal Path-Finding, and Initial Target Selection

Take-home exam #2: Ch. 5-7, and all material from lectures (available Oct 31, due Nov 7, 11:59 p.m.)

Nov 3 - 7 Chapter 8: Neuronal Survival and Programmed Cell Death

Nov 10 - 14 Chapter 9: Synaptic Formation and Reorganization Part I: The Neuromuscular Junction

Nov 17 - 21 Chapter 10: Synaptic Formation and Reorganization Part II: The Synapses in the Central Nervous System

Nov 24-29 **Thanksgiving break – no classes**

Dec 1 - 3 **Bonus Topic:** Overview of Neurodevelopmental Disorders (reading to be assigned)

Take-home exam #2: Ch. 8-10 + reading on Neurodevelopmental Disorders, and all material from lectures (available Dec 3, due Dec 7, 11:59 p.m.)

Comprehensive Final Exam - all chapters, all readings, and all lectures (available Dec 8, due Dec 12, 11:59 p.m.)

COURSE EVALUATIONS: Students are expected to provide professional and respectful feedback on the quality of 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.ua.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, or in their Canvas course menu under GatorEvals, or via ufl.bluer.com/ufl/. Summaries of course evaluation results [are available to students here](#).

GETTING HELP: For issues with technical difficulties for E-learning in Canvas, please contact the UF Help Desk at:

- Learning-support@ufl.edu
- (352) 392-HELP - select option 2
- <https://lss.at.ufl.edu/help.shtml>

** Any requests for special consideration due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail Dr. Devine within 24 hours of the technical difficulty if you wish to request any special considerations.

Other resources are available at <http://www.distance.ufl.edu/getting-help> for:

- Counseling and Wellness resources
- Disability resources
- Resources for handling student concerns and complaints
- Library Help Desk support

ADDITIONAL SUPPORT 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. [Click here to get started with the Disability Resource Center](#). It is important for students to share their accommodation letter and discuss their access needs, as early as possible in the semester.

CURRENT UF GRADING POLICIES FOR ASSIGNING GRADE POINTS can be found at this [link to the university grades and grading policies](#).

IN-CLASS RECORDING: 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 education 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 an 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 presentation 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 guest 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.

Campus Resources: Health and Wellness

U Matter, We Care: If you or someone you know is in distress,

please contact <mailto:umatter@ufl.edu>, 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit the [Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the [Student Health Care Center website](#).

University Police Department: Visit [UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the [UF Health Emergency Room and Trauma Center website](#).

GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the [GatorWell website](#) or call 352-273-4450.

Campus Resources: Academic Resources

E-learning technical support: Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at <mailto:helpdesk@ufl.edu>.

[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. Call 866-281-6309 or email ask@ufl.libanswers.com for more information.

[Teaching Center](#): 1317 Turlington Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

[Writing Studio](#): Daytime (9:30am-3:30pm): 2215 Turlington Hall, 352-846-1138 | Evening (5:00pm-7:00pm): 1545 W University Avenue (Library West, Rm. 339). Help brainstorming, formatting, and writing papers.

Academic Complaints: Office of the Ombuds; Visit the [Complaint Portal webpage](#) for more information.

Enrollment Management Complaints (Registrar, Financial Aid, Admissions): View the Student Complaint Procedure webpage for more information.