

**BIO 481: Introduction to Neurobiology**  
**3-credits (135-hours direct + indirect instruction)**  
**Summer 2022 Syllabus for Online Section 970**  
**Meeting Location: Canvas**  
**Dates/Times: May 16 – June 24; Every Day**

**Professor:** Dr. Nick Pullen  
**Office Location:** Ross 2536  
**Office Hours:** By Appointment – just send me an email

**Office Phone:** 970-351-1843  
**email:** [nicholas.pullen@unco.edu](mailto:nicholas.pullen@unco.edu)

**Time Commitment.** This is an accelerated, 6-week, online course. Following the definition of a credit hour ([see here](#)), you should spend a minimum of 45-hours working per credit. Since this is a 3-credit course that means you should spend a minimum of 135-hours total working on content for this course. Over 6-weeks this equates to 22.5-hours per week. Thus, it is necessary to work on this course a little more than 3-hours every day. Work includes reading and taking notes on the assigned resources, viewing lectures, and completing assignments.

**This course is not self-paced; there are deadlines.**

**Course Description.** The molecular, cellular, and anatomical principles and network properties of the nervous system will be studied, with a focus on human biomedical applications. [UNC 2021-2022 Catalog](#).

**Course Purpose & Objectives.** An overarching principle of homeostasis is the regulation of all physiological parameters by the nervous system. In this course we will examine the foundational content in human neurobiology, which will include anatomical, histological, and molecular information. We will explore the basic science explaining some of the functional properties of the nervous system, particularly in the context of emergent complex network properties, such as learning and memory. The ultimate goal of this course is to be a basis for more advanced graduate studies in the discipline and professional work in biomedicine. Specific, measured objectives are:

- Identification of developmental, gross anatomical, and histological components of the central and peripheral nervous systems.
- Integration of prerequisite knowledge of cell biology to explain the biochemical basis of neuronal and glial electrical, ionotropic, and metabotropic signaling.
- Description of the organization of major nervous system circuits and their relationships to activities such as learning, memory, behavior, cognition, and homeostatic control of other body systems.
- Description of other systems' roles in regulating the nervous system (*e.g.*, immune and endocrine feedback to the nervous system).
- Development of logical hypotheses and experimental plans addressing defined problems in neurobiology.
- Interpretation of data.
- Connection of defined symptoms to dysfunctions of specific neurobiological concepts.
- Summary and definition of major points from provided primary and secondary literature in neurobiology.
- Demonstration of the ability to find and describe relevant, modern scientific literature about a specific neurobiology topic.

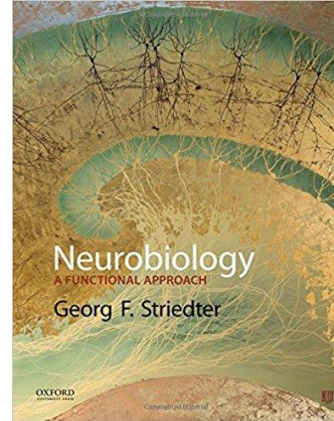
**Required Text.** *Neurobiology: A Functional Approach* by Georg F. Striedter (2016) Oxford University Press.

ISBN: 978-0-19-539615-7

Additional materials posted in Canvas will include:

- readings from the scientific literature
- readings from popular literature
- videos and other multi-media resources

Review of all posted additional materials is **required** unless the page title starts with **"FYI:"**.



**Outline of Course Content.**

Each module corresponds to a week.

Recorded lectures follow the reading and content is locked until the indicated week.

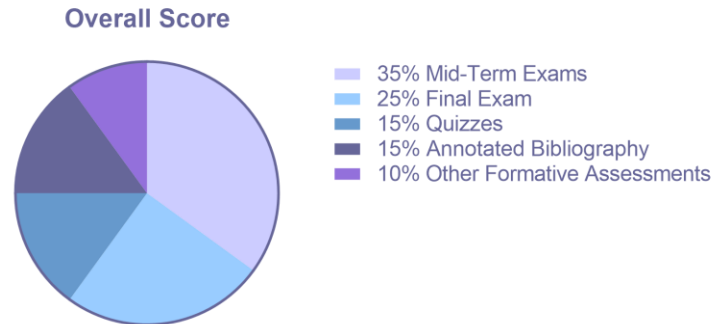
Assignments (except intro. post) are due by 11:59pm on Saturdays.

<b>Module</b>	<b>Topic</b>	<b>Reading (Striedter Ch)</b>	<b>Assignments</b>
<b>1 (May 16-21)</b>	The Basics: Cells, Development, and Fundamental Anatomy of the Nervous System	1, 2, 4, 16	Quiz 1, Minute Responses, Intro Post, Next Step post for provided literature, seek approval for research topic
<b>2 (May 22-28)</b>	Electrophysiology, Plasticity, and the Complexity of Networks	2, 3	Model of an action potential, Minute Response, Next Step post, Exam 1
<b>3 (May 29-June 4)</b>	Sensing the World	6, 7, 11, 12	Quiz 2, Annotated Bib. 1, Minute Response, play Mozak
<b>4 (June 5-11)</b>	Responding to the World	8, 9, 10	Minute Response, Muscle Fatigue post, Exam 2
<b>5 (June 12-18)</b>	Complex Emergent Functions: Neuromodulation, Learning & Memory	13, 14, 15	Quiz 3, Minute Response, Neuroethology/psychology post
<b>6 (June 19-24)</b>	Protecting the Nervous System	5 and mostly Supplementary	Annotated Bib. 2, Minute Response, Final Exam

**Assignments & Grades.** You earn your letter grade by completing the assignments in this class. Since they follow along with the readings and recorded lectures, you will want to make sure to maintain a steady schedule engaging with the content, taking notes, asking questions, and researching topics further. At the end of the term, your letter grade will be based on your overall score, which is made up of the assignments distributed in five weighted categories, as follows:

Letter Graded, 10-percent scale

<u>Overall % Range</u>	<u>Assigned Letter Grade</u>
≥90%	A
≥80%, <90%	B
≥70%, <80%	C
≥60%, <70%	D
< 60%	F



- +/- grades are not given for BIO 481.
- Individual assignments are not curved; however, I reserve the right to curve overall percentages at the end of the semester if necessary.
- Percentages are not rounded for BIO 481.

*(35%) Mid-Term Exams.* Exams 1 & 2 (20% each) cover units of closely related content. These exams will assess relevant learning objectives through questions such as multiple choice, matching, and true/false, as well as written short answer and drawn models. All exams will involve a mix of lower-order items and higher-order analysis, including the interpretation of data.

*(25%) Final Exam.* The final exam is similar in structure to unit exams except that it is longer and covers the entire course. About a third of the final covers modules 5 & 6.

*(15%) Quizzes.* Quizzes are given between exams to assess student progress with new content and learning objectives. Items are shorter and mostly cover lower-order review.

*(15%) Annotated Bibliography.* By the end of the first week of classes you need to select a specific topic of interest relevant to neurobiology, then briefly discuss it with and gain approval from me. Throughout the course, you will develop a bibliography of a minimum of 18 contemporary references (<5-years old) concerning your research topic; 9 new references per turn-in. Each reference will require a one paragraph annotation briefly describing the central hypothesis, techniques, and findings contributing to the advancement of knowledge on the chosen topic.

*(10%) Formative Assessment.* You will occasionally turn in a one sentence “capture” of the main idea of a given module’s topics and/or one question and answer to gauge your active participation in class. Additionally, there will be other discussion and creative activities under this category. One example is “Next Steps” for learning about certain topics, in other words, based on your understanding of one of the assigned readings, what you think should be addressed next in the literature. Another example is producing a model of an action potential, and yet another will be the use of a citizen science program.

*Extra Credit.* There will be opportunities for optional extra credit, stay tuned.

**Late Work Policy.** Late work is not usually accepted for this course. Communicate with me as early as possible if you encounter issues completing coursework.

**Canvas.** This course is administered through [canvas.unco.edu](https://canvas.unco.edu). Make sure Canvas *Announcements* and *Conversations* are set to “*Notify me right away*”. This is an account-wide setting accessed by clicking on your account portrait → notifications. Check the course pages daily, as it is expected that just over 3-hours of work per day is necessary for this accelerated Summer format.

**Communication.** Everyone in this course is expected to communicate in a positive manner. All feedback in discussions should be constructive and professional. Overtly negative and otherwise harassing behavior is considered misconduct and is unwelcome. Any student engaging in such behavior (or facilitating it) will be warned; if the behavior continues, I will seek pertinent administrative reporting of the offense and withdrawal of the student(s) involved.

**The best method for contacting me** is via email or the Canvas messaging system. I strive to respond within 24-hours, often less.

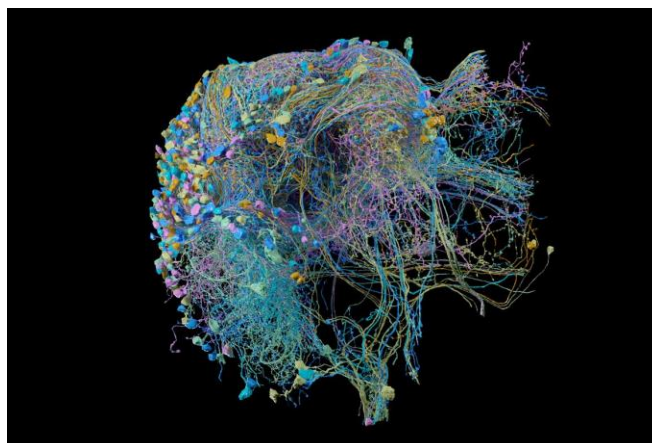
For real-time conversation with me, schedule a meeting at least 1-day in advance. We can meet in person in my office (Ross 2536), or virtually.

**Disability Resources.** It is the policy and practice of the University of Northern Colorado to create inclusive learning environments. If there are aspects of the instruction or design of this course that present barriers to your inclusion or to an accurate assessment of your achievement (*e.g.*, time-limited exams, inaccessible web content, use of videos without captions), please communicate this with me and contact Disability Resource Center (DRC) to request accommodations.

Office: (970) 351-2289, Michener Library L-80.

Students can learn more here: [www.unco.edu/disability-resource-center](https://www.unco.edu/disability-resource-center)

**Academic Integrity.** You are expected to practice academic honesty in every aspect of this course. Upon matriculation at UNC, all students contractually agreed to principles of integrity (the BEAR Code; [link](#)). Those who engage in academic misconduct are subject to grading consequences and university disciplinary procedures through the Office of Community Standards and Conflict Resolution. Academic misconduct includes, but is not limited to, copying someone else’s work, using banned material while taking exams, and posting or using other’s intellectual property (lecture notes, recordings) without permission or in ways that are not explicitly allowed. The grade penalty for academic misconduct is an F grade for the course.



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