

**BIO 481: Introduction to Neurobiology**  
**3-credits (135-hours direct + indirect instruction)**  
**Summer 2020 Syllabus for Online Section 970**  
**Meeting Location: Canvas**  
**Dates/Times: May 18 – June 28; Every Day**

**Professor:** Dr. Nicholas Pullen

**Office Location:** Remote for Summer 2020

**Office Hours:** By Appointment at [this link](#)

**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 ([click here](#)), students should spend a minimum of 45-hours working per credit. Since this is a 3-credit course that means students 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.

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

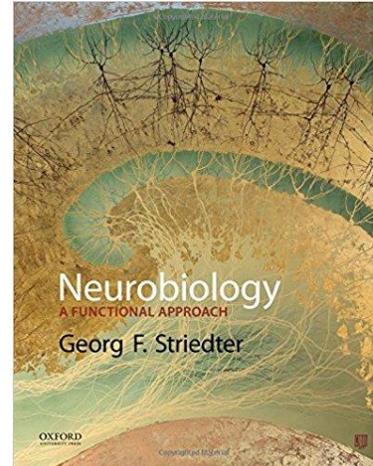
**Prerequisite.** BIO 350 (Human Physiology)

**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 19-20 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 interface with 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 foundation 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 systems.
- 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
- reading from popular literature
- videos and other multi-media resources

Review of all posted additional materials is **required** unless the title start 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.

<i>Module</i>	<i>Topic</i>	<i>Reading (Striedter Ch)</i>	<i>Assignments</i>
<b>1 (May 18-23)</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 24-30)</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 31-June 6)</b>	Sensing the World	6, 7, 11, 12	Quiz 2, Annotated Bib. 1, Minute Response
<b>4 (June 7-13)</b>	Responding to the World	8, 9, 10	Minute Response, Muscle Fatigue post, Exam 2
<b>5 (June 14-20)</b>	Complex Emergent Functions: Neuromodulation, Learning & Memory	13, 14, 15	Quiz 3, Minute Response, Neuroethology/psychology post
<b>6 (June 21-28)</b>	Protecting the Nervous System	5 and mostly Supplementary	Annotated Bib. 2, Minute Response, Final Exam

## Course Requirements.

(40%) *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.

(30%) *Final Exam.* The final exam is similar in structure to unit exams except that it is longer and covers the entire course. About 33% 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.

(10%) *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 the instructor. 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.

(5%) *Formative Assessment.* You will be occasionally turn in a one sentence “capture” of the main idea of a given day’s topic and/or one question and answer to gauge your active participation in class. Additionally, there will occasionally be other discussion and creative activities that fall under this category.

**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.

**Method of Evaluation.** Letter Graded, 10-point 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 awarded 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.

**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 the account portrait→notifications. Check the course pages daily, as it is expected that just over 3-hours of work per day is necessary for the accelerated Summer format.

**Communication.** All participants in this course are expected to communicate in a positive manner. All feedback in discussions should be constructive and tempered with professional language. 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 the instructor will seek administrative 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. This meeting can be over the phone, Zoom, Microsoft Teams, or similar.

**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](http://www.unco.edu/disability-resource-center)

I am a [DRC Faculty Ambassador](#), so please feel free to discuss DRC relevant issues with me in this and/or other courses at UNC.

**Honor Code.** All members of the University of Northern Colorado community are entrusted with the responsibility to uphold and promote five fundamental values: Honesty, Trust, Respect, Fairness, and Responsibility. These core elements foster an atmosphere, inside and outside of the classroom, which serves as a foundation and guides the UNC community's academic, professional, and personal growth. Endorsement of these core elements by students, faculty, staff, administration, and trustees strengthens the integrity and value of our academic climate.

**UNC Policies.** UNC's policies and recommendations for academic misconduct will be followed. For additional information, please see the Student Code of Conduct at the Dean of Student's <http://www.unco.edu/dean-of-students/offices-resources/student-rights-responsibilities/>. In the case of academic appeals, university procedures will be followed. For information on academic appeals, see [http://www.unco.edu/registrar/pdf/academic\\_appealprocess.pdf](http://www.unco.edu/registrar/pdf/academic_appealprocess.pdf).



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