Molecular, Developmental and Systems Neuroscience
NEUR 335-DL1
Spring 2021

Instructor: Dr. Jennifer Brielmaier	**E-mail address:** jbrielma@gmu.edu
Class time: Online	**Office phone #:** 703-993-1469
Class location: Online	**Virtual office hours:** Tues. 12-1 pm
Grading TA: Dylan Scarton	**TA Email:** dscarton@gmu.edu

Last day to add Feb 1
Last day to drop with 100% tuition refund Feb 12
Last day to drop with 50% tuition refund Feb 16

Course description:

Developmental neuroscience refers to the study of the cellular and molecular events underlying the emergence of the nervous system during embryonic development and beyond. Topics include patterning of the nervous system, cell differentiation, axon guidance, synapse formation, and neural death. Systems neuroscience involves the study of neural circuits, organized into sensory and motor systems, whose activity gives rise to complex functions. For each of these systems, pathways of information flow, information processed at each level, overall function, and consequences of injury/damage will be discussed. Students are also expected to become familiar with the scientific methods used to tackle questions in developmental/systems neuroscience as well as current questions and/or controversies in the field.

This course will consist of a series of lectures, quizzes, group activities, and exams to be completed online. The course is asynchronous, meaning that there are no *required* virtual or in-person meeting times. However, there are weekly deadlines and exams will occur on specific dates. There will also be an optional synchronous session (see office hour listing above) once per week. All course tasks are described in detail below.

Required textbook:
Purves, D., et al. (2017) *Neuroscience, 6th Edition*. Sinauer Associates. ISBN: 9781605353807

Optional recommended materials:
- Diamond, M.C., Scheibel, A.B., & Elson, LM. The Human Brain Coloring Book. Coloring Concepts, Inc. ISBN: 978-0064603065

Learning goals:

- Describe molecules and signaling pathways responsible for various neurodevelopmental processes
- Outline the specific pathways through which sensory information is transmitted from peripheral receptors to brain regions responsible for higher-order processing and integration.
- Outline the specific pathways within the brain and spinal cord responsible for control of simple and complex motor behaviors.
- Gain an appreciation for the clinical applicability of developmental and systems neuroscience research.

- Begin to hone skills in communicating about peer-reviewed developmental or systems neuroscience research to a wider audience.

Course tasks:

- **Chapter Quizzes:** Following completion of all other tasks for a chapter, you will take an online chapter quiz via Blackboard. All quiz questions are multiple-choice and cover topics that will appear on exams. Quizzes are open book/note and timed, and you may only take each quiz once. **Quizzes must be completed BY (not at) 11:59 pm on their specific due dates** (see course schedule below). There will be a total of 12 chapter quizzes, and your lowest two quiz grades will be dropped. Thus 10 quizzes will count toward your final grade for a total of 10% of your final grade.

- **Group Activities/Discussions:** Learning is enhanced by interactions with others. Each of you will be assigned to a group of 3-4 students with whom you will work throughout the semester. Depending on the week/chapter you will either contribute to a group activity/assignment OR work on a problem individually and discuss it with your group. Specific instructions will be given each week. Regardless of the type of activity, you will be assigned a grade based on your own work. Contributions to the group assignments are worth 6 points each, whereas the individual activities + group discussions are worth 9 points each. Together these account for 20% of your final grade.

- **Exams:** There will be a total of three exams consisting of multiple choice, fill in the blank, and short answer questions. Exams are not open book/note and will be timed. Each student will be videotaped during exams using the Respondus LockDown Browser Monitor; thus, a webcam is required for exams. Each exam accounts for 20% of your final grade (60% total). There is an optional cumulative final exam which may be taken to replace the lowest of your 3 exam scores.

- **News & Views Report**: Effective oral and written communication is a "transferable skill" that transcends disciplines. The ability to engage the lay public is critical to garner financial support for research. However, as we delve deeper into our particular research area, it becomes more difficult to convey information in a manner that the general public can grasp and become excited about. Thus, students will hone their written communication skills by writing a 1-2 page "News & Views" style summary of a review or primary research paper. Sample reports and guidelines are posted on Blackboard. These reports may be submitted at any time leading up to the deadline; all reports must be uploaded to Blackboard no later than Monday, April 19. The report will account for 10% of your final grade.

Grading:

Chapter Quizzes (10%) + Group Activities (20%) + Exams (60%) + News and Views Report (10%) = 100%

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Grades will be assigned based on the following scale:

A+ 97% or above	B+ 87-89%	C+ 77-79%	D 60-69%
A 93-96%	B 83-86%	C 73-76%	F 59% & below
A- 90-92%	B- 80-82%	C- 70-72%	

Incomplete (IN) grades will be assigned only in cases of compelling and documented need, in accordance with policies set forth in the University Catalog.

Schedule:

NOTE: You are responsible for knowing about all announcements and any syllabus or schedule modifications made via Blackboard and/or email.

WEEK	CONTENT	ASSIGNMENTS DUE
UNIT 1 DEVELOPMENT		
Week 1 Tue 01/26- Mon 02/01 02/01 Last Day to Add	Getting Started Course Introduction	**Mon 02/01 by 11:59 pm:** Review technology and links on Getting Started page Syllabus and Schedule Quiz Introduce yourself on the class Padlet wall and to your group
Week 2 Tue 02/02- Mon 02/08	Chapter 22: Early Brain Development	**Mon 02/08 by 11:59 pm:** Ch. 22 Quiz Ch. 22 Group Activity
Week 3 Tue 02/09- Mon 02/15 02/12 Last Day to Drop	Chapter 23: Construction of Neural Circuits	Mon 02/15 by 11:59 pm: Ch. 23 Quiz Ch. 23 Group Activity & Discussion (draft and initial comment by 2/13)
Week 4 Tue 02/16- Mon 02/22	Chapter 24: Experience-Dependent Plasticity	Mon 02/22 by 11:59 pm: Ch. 24 Quiz Ch. 24 Group Activity & Discussion (draft and initial comment by 2/20)
Week 5 Tue 02/23- Mon 03/01	**Exam 1 Prep and Exam (Chapters 22, 23, 24)**	**Exam 1 opens at 12 am Thurs 02/25; due by 11:59 pm Mon 03/01**
UNIT 2 SENSORY SYSTEMS		
Week 6 Tue 03/02- Mon 03/08	Chapter 12: Central Visual Pathways	Mon 03/08 by 11:59 pm: Ch. 12 Quiz

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WEEK	CONTENT	ASSIGNMENTS DUE
		Ch. 12 Group Activity & Discussion (draft and initial comment by 3/6)
Week 7 Tue 03/09- Mon 03/15	Chapter 13: The Auditory System	Mon 03/15 by 11:59 pm: Ch. 13 Quiz Ch. 13 Group Activity & Discussion (draft and initial comment by 3/13)
Week 8 Tue 03/16- Mon 03/22	Chapter 9: The Somatosensory System	Mon 03/22 by 11:59 pm: Ch. 9 Quiz Ch. 9 Group Activity
Week 9 Tue 03/23- Mon 03/29	**Exam 2 Prep and Exam (Chapters 9, 12, 13, 15)**	**Exam 2 opens 12 am Thurs 03/25; due by 11:59 pm Mon 03/29**
Week 10 Tue 03/30- Mon 04/05	Chapter 16: Lower Motor Neurons	Mon 04/05 by 11:59 pm: Ch. 16 Quiz Ch. 16 Group Activity
UNIT 3 MOTOR SYSTEMS		
Week 11 Tue 04/06- Mon 04/12	Chapter 17: Upper Motor Neurons	Mon 04/12 by 11:59 pm: Ch. 17 Quiz Ch. 17 Group Activity
Week 12 Tue 04/13- Mon 04/19	Chapter 18: Basal Ganglia	**Mon 04/19 by 11:59 pm:** Ch. 18 Quiz Ch. 18 Group Activity **News and Views Report Due**
Week 13 Tue 04/20- Mon 04/26	Chapter 19: Cerebellum	Mon 04/26 by 11:59 pm: Ch. 19 Quiz Ch. 19 Group Activity
Week 14 Tue 04/27- Mon 05/03	**Exam 3 Prep and Exam (Chapters 16, 17, 18, 19)**	**Exam 3 opens 12 am Thurs 04/29; due 05/03 by 11:59 pm Mon**
Week 15 Tue 05/04- Mon 05/10	**OPTIONAL Final Exam Prep and Exam (All Chapters)**	**OPTIONAL Final Exam opens at 12 am Thu 05/06; due by 11:59 pm Mon 05/10**

Makeup/late work policies:

- **Quizzes:** Any chapter quiz not taken by its deadline will receive a grade of zero. Because the lowest two grades will be dropped, chapter quizzes cannot be made up under any circumstances.

- **Group activities/discussions:** In accordance with the grading rubrics, 1 point will be deducted for group work that is turned in 1-24 hours late and 3 points will be deducted for group work that is turned in more than 24 hours late.

- **Exams:** Late exams will only be permitted with medical or similar documentation. If you fail to take Exams 1, 2 or 3 by the deadline, and do not have documentation, you will need to plan on taking the final exam in order to make up for the missing grade.

- **News and Views Report:** A 10% per day late penalty will be applied to reports not turned in by the deadline. After 10 days, the grade becomes a zero.

Extensions on exams, quizzes, and/or problem sets will only be given for students with academic accommodations through the Office of Disability Services. Without such accommodations, permission to postpone work will only be given for very acute and important reasons, with documentation and at my discretion. A 10% per day late penalty may be applied in these situations.

Students are responsible for checking the GMU Academic Calendar and making sure they are available to complete coursework throughout the entire semester. For an online course this means ensuring you have reliable Internet access from beginning to end. **Exams and other work may not be postponed due to travel occurring during the semester**; nor can the final exam be taken earlier than the scheduled timeframe.

Commitment to an inclusive learning environment:

Your experience in this class is important to me. It is my intent that students from all diverse backgrounds, perspectives and circumstances be well served by this course and that students' learning needs are addressed. If there are apsects of the design, instruction, and/or experiences within this course that result in barriers to your inclusion or accurate assessment of your achievement, please notify me as soon as possible and/or contact the Office of Disability Services. If you are seeking accommodations for this class, please first visit http://ds.gmu.edu/ for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: ods@gmu.edu | Phone: (703) 993-2474

Official communications via GMU email:

Mason uses electronic mail to provide official information to students. Examples include communications from course instructors, notices from the library, notices about

academic standing, financial aid information, class materials, assignments, questions, and instructor feedback. Students are responsible for the content of university communication sent to their Mason email account, and are required to activate that account and check it regularly.

Technology statement:

Required knowledge of technology for this course includes ability to access course materials posted on Blackboard and/or sent via email to your GMU address. To log in to Blackboard, go to the MyMason portal at https://mymason.gmu.edu, enter your PatriotPass credentials (i.e., your Mason email username and password), and select the Courses tab. **Please be sure that you have continuous access to Blackboard and that your GMU email account is active.**
The technology requirements for this online course are as follows:

Hardware:
- A Windows or Macintosh computer with at least 2 GB of RAM and to a fast, reliable broadband Internet connection (e.g., cable, DSL).
- Recommended computer monitor and laptop screen size of 13 inches or larger, for optimum visibility of course material.
- Computer speakers or headphones to listen to recorded content.
- A headset microphone for live audio sessions using course tools like Blackboard Collaborate.
- A webcam (built in to your computer or a portable one that can be externally mounted) for taking exams using Respondus Monitor.
- Enough space on your computer to 1) install the required and recommended software and 2) save your course assignments.

Software:
- Web browser (See Blackboard Support for supported web browsers)
- Blackboard Courses (Log into http://mymason.gmu.edu, select the Courses Tab)
- Blackboard Collaborate (select from the course menu)
- Adobe Acrobat Reader (free download)
- Flash Player (free download)
- Microsoft Office (purchase)
- Respondus LockDown Browser (download from the myMason home page or with this link)

For hardware and software purchases, visit Patriot Computers.

Academic integrity:

George Mason University has an Honor Code, which requires all members of this community to maintain the highest standards of academic honesty and integrity.

Cheating, plagiarism, lying, and stealing are all prohibited. All violations of the Honor Code will be reported to the Honor Committee. See honorcode.gmu.edu for detailed information. You in this course are expected to behave at all times in a manner consistent with the GMU Honor Code. Violations of the Honor Code will not be tolerated in this course and will be reported according to GMU procedures. **You must paraphrase any information from a source into your own words. Do not copy anything word for word, even if you are citing the source. Direct quotes are not accepted in problem sets.** The instructor reserves the right to use software to determine the extent to which the work is the student's.

If you have questions about when the contributions of others to your work must be acknowledged and appropriate ways to cite those contributions, please talk with the professor or utilize the GMU writing center. Here is a great online quiz that you can take to check your knowledge about what is and is not plagiarism: http://www.easybib.com/guides/quiz-is-it-plagiarism/.

Religious holidays:

Please refer to George Mason University's calendar of religious holidays and observations (http://ulife.gmu.edu/calendar/religious -holiday-calendar/). The online asynchronous format of this course offers a great deal of flexibility. If any course deadlines conflict with your religious events, however, please let me know in advance so that we can come up with an acceptable plan.

Student privacy:

George Mason University strives to fully comply with FERPA by protecting the privacy of student records and judiciously evaluating requests for release of information from those records. Please see George Mason University's student privacy policy https://registrar.gmu.edu/students/privacy/

Student services:

- **University Libraries:** University Libraries provides resources for distance students. (See http://library.gmu.edu/distance and http://infoguides.gmu.edu/distance_students).

- **Writing Center:** The George Mason University Writing Center staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing. (See http://writingcenter.gmu.edu). You can now sign up for an Online Writing Lab (OWL) session just like you sign up for a face-to-face session in the Writing Center, which means YOU set the date and time of the appointment! Learn more about the Online Writing Lab (OWL).

- **Counseling and Psychological Services:** The George Mason University Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance (See http://caps.gmu.edu).

Copyright statement:

In accordance with university policy, I hold the copyright on all course materials prepared by me (lecture slides/videos, problem set questions, quiz and exam questions, chapter study questions). Reproducing or sharing these materials outside of our course (e.g. on study websites such as Course Hero, Quizlet, or Study Blue) is a copyright violation and will be reported to the Copyright Office. Students who violate the University Copyright Policy may place themselves individually at risk for liability in the event of a claim of copyright infringement.