Experimental and Conceptual Basis of Modern Neuroscience

Course and contact information:

Course: IBS Neuroscience: NRSC 8284
Semester: Spring 2021

Meeting time: Thursday 2-5. Additional attendance at Neuroscience
IBS seminars most Thursdays 12:30-1:30
Location: Online

Administration

Instructors: Matthew Colonnese (MC) & Masaaki Torii (MT)
Campus address: MC Ross Hall 639; MT Center for Neuroscience Research, Children's National

Phone: MC 202-994-4596; MT 202-476-4279

Cell Phone Contact: MC 202-243-9276
GW E-mail: Colonnese@gwu.edu; MTorii@childrensnational.org

Remote office hours: By arrangement

Administrative Coordinator: Colleen Kennedy (gwibs@gwu.edu)

Course prerequisites:

Completion of first semester of the IBS PhD program or permission of instructor.

Learning outcomes

As a result of completing this course, students will be able to:

1. Synthesize and explain the key experimental underpinnings of neural development and function.
2. Summarize for lay person conceptual and experimental foundations of key neuroscience topics.

Required textbooks and recommended readings:

Primary literature and background readings will be provided by course directors for each session.

Schedule:

Date	Topic		Instructor
January 14:	12:30-1:30	Seminar (Tobias Enger, Duke))	
	2-3	Speaker meeting	
	3-3:30	Course Introduction	Colonnese/Torii
	3:30-5	Neuronal Polarity and Its establishment	Torii
January 21:	12:30-1:30	Seminar (Andrew Miller (Emory))	
	2-3	Speaker meeting	
	3-5	Neural Development 1 (Specification,	Zohn

		proliferation, differentiation, migration)	
January 28:	2-3	Synaptic Release (Fatt & Katz)	Colonnese
	3-5	Neuronal Development 2 (Intrinsic determinants of neuronal circuit development and synaptogenesis)	Triplett
February 4:	12:30-1:30	Seminar (Benjamin Auerbach (UIUC))	
	2-3	Speaker meeting	
	3-5	Evolution and development of human Neocortex	Hashimoto-Torii/Torii
February 11:	12:30-1:30	Seminar (Bill Rebeck (Georgetown))	
	2-3	Speaker meeting	
	3-5	Neuronal Excitability	Colonnese
February 18:	12:30-1:30	Seminar (Alison Barth (Carnegie Mellon))	
	2-3	Speaker meeting	
	3-5	Excitatory Synapse	Colonnese
February 25:	2-3:30	Glia (oligodendrocytes)	Miller
	3:30-5	Glia (astrocytes, microglia)	Smith
March 4:	12:30-1:30	Seminar (Lin Mei (Case Western)	
	2-3	Speaker meeting	
	3-5	Inhibitory Synapse	Polter
March 11:	12:30-1:30	Seminar (Ishmail Abdus-Saboor (U Penn))	
	2-3	Speaker meeting	
	3-5	Neuromodulators	Polter

March 18 SPRING BREAK (There is still a seminar**)**

March 25:	2-3:30	Motor Control	Lu
	3:30-5	Amygdala/Fear	Marvar
April 1:	12:30-1:30	Seminar (Dominique Pritchett (Howard))	
	2-3	Speaker meeting	
	3-4	Somatosensory System	Shoykhet
	5-6	Visual System	Chalulpa
April 8:	12:30-1:30	Seminar (Adema Ribic (UVA))	
	2-3	Speaker meeting	
	3-5	Visual Plasticity and Learning	Sidorov
April 15:	12:30-1:30	Seminar (Student Speakers TBD))	
	2-3	Speaker meeting	

	3-5	Homeostatic Behavior and Hypothalamus	Young
April 22:	2-5	Thalamocortical circuits	Colonnese

Assignments

1. Class participation. 50%.

A. Each course session will have a pre-session preparation component consisting of a review paper or textbook chapter. Students will be asked to summarize important components of this work verbally during the session. Students should also come with two questions regarding the readings that demonstrate underlying knowledge of the readings. Questions will be graded pass/fail by the instructor.

B. For the Seminar Speaker sessions (students will meet with the speaker before the seminar) each student should come with one prepared question derived from the readings assigned by the seminar speaker. These should be focused on gaining a solid understanding of the techniques used by the scientist and/or key questions in the field. Questions will be emailed to MC prior to the session and are encouraged to be asked to the speaker given time. Questions should demonstrate knowledge of the assigned paper.

Attendance at the seminar is also required to receive a pass for the assignment.

2. Written Assignments. 50%

Two 'Wikipedia'-style overviews of a topic covered within the course. The topic should expand upon some limited subject covered during the session. The first will be on an aspect of Neural development/Cellular Neuroscience (Sessions prior to (and including) March 4). Proposal for the article will be submitted by March 9th. And the article due March 23rd. You may revise the first article based on the feedback of the directors, with the revision potentially increasing the grade by up to 20 points (out of 100). The second article will cover the topics in the remainder of the class. The proposal for the last article is April 26th, and due May 11th. There is no revision option.

University policies

Use of Electronic Course Materials and Class Recordings

Students are encouraged to use electronic course materials, including recorded class sessions, for private personal use in connection with their academic program of study. Electronic course materials and recorded class sessions should not be shared or used for non-course related purposes unless express permission has been granted by the instructor. Students who impermissibly share any electronic course materials are subject to discipline under the Student Code of Conduct. Please contact the instructor if you have questions regarding what constitutes permissible or impermissible use of electronic course materials and/or recorded class sessions. Please contact Disability Support Services at disabilitysupport.gwu.edu if you have questions or need assistance in accessing electronic course materials.

Academic Integrity Code

Academic Integrity is an integral part of the educational process, and GW takes these matters very seriously. Violations of academic integrity occur when students fail to cite research sources properly, engage in unauthorized collaboration, falsify data, and in other ways outlined in the Code of Academic Integrity. Students accused of academic integrity violations should contact the Office of Academic Integrity to learn more about their rights and options in the process. Outcomes can range from failure of assignment to expulsion from the University, including a transcript notation. The Office of Academic Integrity maintains a permanent record of the violation.

More information is available from the Office of Academic Integrity at studentconduct.gwu.edu/academic-integrity. The University's "Guide of Academic Integrity in Online Learning Environments" is available at studentconduct.gwu.edu/guide-academic-integrity-online-learning-environments. Contact information: rights@gwu.edu or 202-994-6757.

University policy on observance of religious holidays

In accordance with University policy, students should notify faculty during the first week of the semester of their intention to be absent from class on their day(s) of religious observance. For details and policy, see "Religious Holidays" at provost.gwu.edu/policies-procedures-and-guidelines

Support for students outside the classroom

Virtual academic support

A full range of academic support is offered virtually in fall 2020. See coronavirus.gwu.edu/top-faqs for updates.

Tutoring and course review sessions are offered through Academic Commons in an online format. See academiccommons.gwu.edu/tutoring

Writing and research consultations are available online. See academiccommons.gwu.edu/writing-research-help

Coaching, offered through the Office of Student Success, is available in a virtual format. See studentsuccess.gwu.edu/academic-program-support

Academic Commons offers several short videos addressing different virtual learning strategies for the unique circumstances of the fall 2020 semester. See academiccommons.gwu.edu/study-skills. They also offer a variety of live virtual workshops to equip students with the tools they need to succeed in a virtual environment. See tinyurl.com/gw-virtual-learning

Writing Center

GW's Writing Center cultivates confident writers in the University community by facilitating collaborative, critical, and inclusive conversations at all stages of the writing process. Working alongside peer mentors, writers develop strategies to write independently in academic and public settings. Appointments can be booked online. See gwu.mywconline.

Academic Commons

Academic Commons provides tutoring and other academic support resources to students in many courses. Students can schedule virtual one-on-one appointments or attend virtual drop-in sessions. Students may schedule an appointment, review the tutoring schedule, access other academic support resources, or obtain assistance at academiccommons.gwu.edu.

Disability Support Services (DSS) 202-994-8250

Any student who may need an accommodation based on the potential impact of a disability should contact Disability Support Services to establish eligibility and to coordinate reasonable accommodations. disabilitysupport.gwu.edu

Counseling and Psychological Services 202-994-5300

GW's Colonial Health Center offers counseling and psychological services, supporting mental health and personal development by collaborating directly with students to overcome challenges and difficulties that may interfere with academic, emotional, and personal success. healthcenter.gwu.edu/counseling-and-psychological-services

Safety and Security

- In an emergency: call GWPD 202-994-6111 or 911
- For situation-specific actions: review the Emergency Response Handbook at safety.gwu.edu/emergency-response-handbook
- In an active violence situation: Get Out, Hide Out, or Take Out. See go.gwu.edu/shooterpret
- Stay informed: safety.gwu.edu/stay-informed