SYLLABUS, NEUROPHYSIOLOGY 1012 and 2012, SPRING 2020
I. GENERAL INFORMATION

COURSE NUMBERS

Course #	*Class #*	*Class Section*	*Recitation #*	*Recitation Section*
1012 (Undergrad)	22232	1180	22233	1185
2012 (Graduate)	30099	1010	30100	1015

2012 students: please discuss other requirements with Dr. Johnson after the 1st class

CLASS MEETING TIMES AND LOCATION

Class Type	*Day(s)*	*Time*	*Location*
Lecture	Mon, Wed	1:00 – 2:15 pm	Room L9 Clapp Hall
Recitation	Fri	1:00 – 1:50 pm	Room L9 Clapp Hall

INSTRUCTOR AND TEACHING ASSISTANTS (TAs)

Name	*Role*	*Email*	*Other contact*
Jon W. Johnson	Instructor	jjohnson@pitt.edu	(412) 624-4295
Mahmoud M. Khalil	Grad TA	MAK429@pitt.edu	(412) 624-8636
Kacie F. Barry	Undergrad TA	KFB16@pitt.edu	(201) 787-5794
Anisha Venkatesh	Undergrad TA	ANV62@pitt.edu	(717) 880-1462

OFFICE HOURS (if office hours are not convenient, appointments also can be made)

Name	*Day(s)*	*Time*	*Location*
Jon Johnson	Wed	2:15 – 4:15 pm	Room 458 Crawford Hall
Mahmoud Khalil	Mon, Wed	12:20 – 12:50 pm	Room 454 Crawford Hall
Kacie Barry	Tue	noon – 1 pm	Room 454 Crawford Hall
Anisha Venkatesh	Thu	6:00 – 7:00 pm	Nordy's Place, William Pitt Union

WEB SITE

Much information essential to the course will be available at our Web site, which can be accessed through the University of Pittsburgh CourseWeb site (http://courseweb.pitt.edu/). Please familiarize yourself with the site and check it often. If you have website questions or requests, please contact Kacie Barry or Anisha Venkatesh.

ACADEMIC INTEGRITY

All students must comply with University of Pittsburgh's Policy on Academic Integrity (http://www.provost.pitt.edu/info/ai1.html). Violations will be handled according to Pitt policy.

INFORMATION FOR STUDENTS WITH DISABILITIES

If you have a disability for which you wish to request accommodations, please contact Dr. Johnson and the Office of Disability Resources and Services (140 William Pitt Union; (412) 648-7890; http://www.studentaffairs.pitt.edu/drs/) as early in the term as possible. DRS will verify your disability and determine reasonable accommodations for this course.

EMAIL COMMUNICATION POLICY

University e-mail addresses (username@pitt.edu) may be used for important course-related communication with students. Students are expected to read email sent to their account on a regular basis. Failure to read and react to communications in a timely manner does not

absolve the student from knowing and complying with the content of the communications. See www.bc.pitt.edu/policies/policy/09/09-10-01.html.

STUDENT OPINION OF TEACHING SURVEYS

Students will be asked to complete a Student Opinion of Teaching Survey, which will be sent via Pitt email and appear on your CourseWeb landing page during the last 3 weeks of class. Responses are anonymous. Please respond thoughtfully; your feedback is important to us.

II. GRADING POLICIES

FINAL GRADE DETERMINATION

24% for Problem Sets (8% for each of the three graded Problem Sets)
23% for Exam 1 (75 minute exam)
23% for Exam 2 (75 minute exam)
30% for Exam 3 (110 minute exam during finals week)

MATERIALS PERMITTED DURING EXAM

(1) Up to 4 pages of notes are permitted. Pages must be hand-written (one-sided) or typed & printed (one-sided, ≥12 point, single spaced) by the student. No books or photocopies are permitted. Goal: we want to encourage understanding rather than memorization.
(2) A calculator is required for solving some exam problems. Devices with capabilities beyond calculators, such as computers or cell phones, are not permitted.

MISSED EXAMS

Generally a student who misses an exam receives 0 for the exam. Exceptions for medical necessity will be granted for Exams 1 or 2, in which case the student must: (a) contact the instructor before or on the day of the exam; (b) provide a doctor's note stating the student was unable to take the exam when it was given. A makeup exam will not be given. Instead, the student's final grade will be determined as: 31% Problem Sets; 30% Exam 1 or 2; 39% Exam 3. Use of this grading scheme if Exam 1 or 2 is missed for well-justified non-medical reasons may be considered if the student contacts the instructor at least two weeks before the exam. Exam 3 must be taken when given (during finals week) by all students.

GRADED PROBLEM SETS

There will be 3 Graded Problem Sets, which provide students with experience in solving problems and are essential learning tools. Working in study groups to discuss approaches to solving Graded Problem Sets is encouraged. However, solutions to the Graded Problem Sets must be written independently. **If two students hand in identical responses to a problem, their Problem Sets will receive 0 credit**.

Multiple choice and true/false questions generally are not used in Graded Problem Sets because the instructor believes problems that require more detailed answers are better learning tools. As a result, problem set grading is very time-consuming. To avoid excessive time demands on the teaching assistants, student answers to only ~half of the Graded Problem Set questions will be graded. The problems to be graded will not be announced in advance, and students are expected to answer all Graded Problem Set questions.

Dates when Problem Sets will be given out and are due are indicated below. Problem Sets will be accepted up to 1 day late to encourage all students to complete each Problem Set. 5 points (out of 100) will be subtracted from the problem set grade if handed in late. The problem set **is due by 4:00 pm in the Department of Neuroscience Main Office (A210 Langley Hall) on the due date**. If handed in between 4:00 pm sharp on the due date and 4 pm on the Latest Date Accepted, the problem set will be late. 0 credit will be given after 4 pm on the Latest Date Accepted.

Problem Set #	Date Given Out	Date Due	Latest Date Accepted
1	15 Jan	27 Jan (by 4 pm)	28 Jan (by 4 pm)
2	19 Feb	2 Mar (by 4 pm)	3 Mar (by 4 pm)
3	30 Mar	8 Apr (by 4 pm)	9 Apr (by 4 pm)

III. TEXTBOOKS

MAIN TEXTBOOK (recommended; available in book store)

From Neuron to Brain, 5th ed., Nicholls, Martin, Fuchs, Brown, Diamond & Weisblat

Abbreviation used in syllabus: NtoB

SUPPLEMENTAL TEXTBOOK

Cellular Physiology of Nerve and Muscle, 4th ed., Matthews

Abbreviation used in syllabus: CellP

OTHER USEFUL TEXTBOOKS

Essentials of Neural Science and Behavior Study Guide, Calabrese, Gordon, Hawkins & Qian

Principles of Neural Science, 5th ed., Kandel, Schwartz, Jessell, Siegelbaum & Hudspeth

Ion Channels of Excitable Membranes, 3rd ed., Hille

Assigned readings in NtoB and suggested readings in CellP are indicated on the last page of the Syllabus. Students are expected to keep up with readings indicated in the syllabus; reading assignments will not be repeated in class.

To limit textbook cost to students, none of the textbooks is required. Students nevertheless are strongly advised to complete the assigned reading (and, if further clarification is needed, the suggested readings) to reinforce and extend the concepts and information provided in lecture.

All textbooks are available on reserve in Langley Library, and a few copies of some of the textbooks are available in Room 458 Crawford Hall (Dr. Johnson's office) for between-lecture borrowing. Please fill out a card when borrowing a book from the instructor and return the book at the next class meeting.

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IV. SCHEDULE OF LECTURES, READINGS, and EXAMS

Date	Topic	Reading (book and chapter or pages)
Jan 6	Introduction to neurophysiology	NtoB 1 & pp. 159-172
Jan 8	Recording from neurons	CellP 1
Jan 13,15,22	Electrical principles of neuronal function	NtoB Appendix A
Jan 20	*No class (Dr. Martin Luther King's birthday)*	
Jan 27	Structure of biological membranes	NtoB 4, CellP 2
Jan 29	Ion Channels	NtoB 5
Feb 3	Patch-clamp recording techniques	
Feb 5,10	Ionic basis of resting potential	NtoB 6, CellP 3,4,5
Feb 12	**EXAM 1**	
Feb 17	Model of neuron and current-voltage relations	
Feb 19	Na/K pump	NtoB 9
Feb 24	Action potential properties	NtoB 7, CellP 6,7
Feb 26	Voltage clamp techniques	
Mar 2,4	Ion currents responsible for action potentials	
Mar 9,11	*No class (Spring Recess)*	
Mar 16	Ionic basis of action potential properties	
Mar 18	Single-channel basis of action potential currents	
Mar 23	**EXAM 2**	
Mar 25	Other types of ion channels	
Mar 30	Cable properties of neurites	NtoB 8
Apr 1	Action potential propagation	
Apr 6	Introduction to synapses, electrical synapses	NtoB 11, CellP 8
Apr 8	Synaptic responses at the neuromuscular junction	
Apr 13	Nicotinic acetylcholine receptor function	
Apr 15	Fast neuronal synaptic transmission, summation	NtoB p. 279-289, CellP 9

Apr 21 (Tue) **EXAM 3**
Exam 3 will be during Final Exam Week
Time: 10:00 – 11:50 am
Location: Room L9 Clapp Hall (usual lecture room)