ST. JOHN'S UNIVERSITY
DEPARTMENT OF BIOLOGICAL SCIENCES
BIO 2250: INTRODUCTION TO NEUROBIOLOGY

Spring 2016
When: Mon & Thu: 3:25-4:50 PM
Location: ST. JOHN'S HALL 313

Instructor:

Name: Yong Yu, Ph.D., Assistant Professor
Office: St Albert's Hall 210
Office hrs: Mon: 10:30 am-12:00 pm; Thu: 10:30 am-12:00 pm
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Course objective:

This is an advanced course intended to provide an in depth survey of the cellular and molecular aspects of nerve cell function. Topics include the cell biology and biochemistry of neurons, ionic and molecular basis of electrical signals, synaptic transmission and its modulation, function of sensory receptors, neural development, neural plasticity, and the molecular basis of learning and memory.

Required textbook: Neuroscience: Exploring the brain (4rd edition), by Mark Bear et al., *Lippincott Williams & Wilkins (The 3rd edition has some differences but it should be OK to use for this class)*

Online supporting material: Online resources from publisher's website:

4th edition: Look for the link in your text book for online resources.

3rd edition (accessible without buying new book):

http://thepoint.lww.com/Book/ShowWithResource/2816?resourceId=12752
(Answers to Review Questions; Animations; Labeling Exercises; Question Bank; Glossary of Key Terms)

Supplemental Texts (for extra reading, not required):

1. Neuroscience (5th Edition, 2012) by Dale Purves et al.,Sinauer Associates, Inc.
2. Neuroscience Online electronic textbook (**Free access**): http://nba.uth.tmc.edu/neuroscience/index.htm

Course Material:

Lecture slides, animations, handout material, quiz/ exam scores and other information will be available at the course site on **Blackboard** unless otherwise instructed.

Class Attendance:

Several **quizzes** will be given on random days through out of the semester in the first 10 min of class (Don't be late for the class!). Attendance will be based on the quizzes. **Extra credits (2 points) will be given in the final score to the ones who take all quizzes.**

Special lectures/ literature study

It is very important for a researcher to read original article in order learn the updated scientific achievement, and new techniques and approaches that other scientists apply to their research. I want to have you trained on this by introducing two special lectures/discussions to study original neuroscience research articles. One article that is closely related to the topics of our course will be given and discussed in each special lecture/discussion. You are asked to understand their concepts, conclusion, and techniques used in their research by reading the articles carefully and searching the concepts and methods if you are not familiar with them. I will ask questions during our discussion and you are welcome to volunteer to answer those questions. Material discussed in these lectures will be included in the exams. Students who are actively involved in discussion may get extra credits in their final score.

Exams and Grading:

1) Quiz: **10%**.

2) Two Midterms and a Final examination will be given. Most of the examination questions will be multiple choice or true/false choice. Each exam (including final exam) will cover material taught after the previous exam. The lowest exam grade among three exams will contribute **15%** and the other two will each contribute **37.5%** towards the semester grade. **No make-up exams will be allowed** for the first two exams except in cases of serious illness or personal crisis, and the student is required to present a letter from the undergraduate dean as well as other supporting evidence (such as doctor's notes, airline tickets etc.) before the exam or no later than 2 working days after the respective exam date.

   If you miss the final exam that will takes place in **May, 2015** (date to be determined), it is mandated by St John's statutes that you present an excuse to the Dean's office, 145 St John's Hall. The Dean's office will give you the exam. The make-up final exam will be different from the regular final exam and contains short answer questions.

   A typical grading scale is:

93-100:	A
90-92.99:	A-
87-89.99:	B+

83-86.99: B
80-82.99: B-
77-79.99: C+
73-76.99: C
70-72.99: C-
67-69.99: D+
60-66.99: D
Below 60: F

Course expectations/requirements:

You should do the reading assignment, attend lectures and take good notes. Read the chapter and the review questions (answers can be found on publisher's website listed above) before you attend the lectures! It is your responsibility to take notes and save/back-up your files properly. Your lecture notes and the text book are the best resource for the preparation of exams. Anything discussed in class may be included on an exam, even if that information is not found in the textbook or online resources. Review your notes and read the textbook again soon after each lecture. Review or take a practice test on the questions for that chapter on publisher's website will help you to understand material and prepare for the exams.

Two lectures will be mainly based on the supplemental textbook (Neuroscience, 5th Edition, by Dale Purves et al.**), I will upload the scanned chapter on Blackboard before the lectures.**

I will upload my PowerPoint slides on Blackboard before the noon of the lecture day but last minute change can be made on them. You are strongly suggested to print out the PowerPoint slides and bring them to the class to take notes on them. Exams will be focused on materials in textbook. However, materials not in the text or handouts will be discussed (for example the research papers), and you will be responsible for these materials on exams. In addition, not all chapters will be covered to the same extent.

For e-mail correspondence, I will use your St John's e-mail address, and you are responsible to check that account. If you send me an e-mail, please include "BIO2250" in the subject line otherwise it may reach my junk mailbox. I check e-mails at least once a day during week-days, and occasionally during weekends. Compared to email, a face-to-face conversation remains the most reliable and effective mode of communication and should be used whenever possible. **You may stop by my office during my office hours but you are also welcome to visit me at other times by appointments through email. Feel free to stop by if you want to talk about an urgent issue and no appointment is needed in this case.**

Course policies:

- Lectures begin at 3:25 PM. Late arrival is **NOT** accepted (in that case get the class notes from another student). You may miss a quiz if you come late to the class.
- Disruptive behavior during lectures that diminishes the educational experience of the fellow students (frequent late arrivals, unsolicited talking to other students during the class, etc.) will result in points being taken off the course grade.
- **All electronic devices (laptops, cell phones, ipad.....) are OFF and put away**. If you prefer to take note on your laptop, please talk to me to get approval.
- NO recording, but you are welcome to ask questions during the lecture.
- Eating and drinking is tolerated if not noisy (no carrots or chips munching...) and you clean after yourself.
- NO cheating or plagiarism. Remember you signed the "academic honor pledge". **During the exam, hats/caps, foods, drinks and Electronic devices are not allowed.**
- Grade appeals: If, after receiving an exam score and you believe a mistake has been made in the grading of your exam, please do not ask about it during class. Come to see me or email me about your questions/concerns. I will check your exam or we can check it together to make sure your grading is correct.

TENTATIVE SCHEDULE

Note: The schedule is only approximate. We may need to adjust the schedule to ensure smooth operation of the class. I will inform you in class and via email for any changes.

Jan. 21 (R) Lecture 1: Introduction- studying the nervous system (chapter 1)
Jan. 25 (M) Lecture 2: Cell biology of Neurons and Glia (chapter 2)
Jan. 28 (R) Lecture 3: Ionic Basis of the Resting Membrane Potential-1 (chapter 3)
Feb. 1 (M) Lecture 4: Ionic Basis of the Resting Membrane Potential-2 (chapter 3)
Feb. 4 (R) Lecture 5: Ionic basis of the Action potential -1 (chapter 4)
Feb. 8 (M) Lecture 6: Ionic basis of the Action potential -2 (chapter 4)
Feb. 10(**W**) Lecture 7: Ion channels and transporters (Purves book chapter 4)
Feb. 11(R) Lecture 8: Synaptic transmission (chapter 5)
Feb 15 (M) President's Day – No class.
Feb.18 (R) **EXAM I** (Lectures 2-8)
Feb. 22(M) Spring break – No class
Feb. 25 (R) Spring break – No class
Feb. 29(M) **No class** (professor attends the Biophysics Society Annual Meeting).
Mar. 3 (R) Lecture 9 *(special): Study of original research articles I (handout)*
Mar. 7 (M) Lecture 10: Neurotransmitter systems (chapter 6)
Mar. 10 (R) Lecture 11: Molecular signaling within neurons (Purves book chapter 7)
Mar. 14 (M) Lecture 12: The structure of the nervous system (chapter 7)

& review of midterm exam I

Mar. 17 (R) Lecture 13: The chemical senses (chapter 8)
Mar. 21 (M) Lecture 14: Vision: the eye - I (chapter 9)
Mar. 24 (R) **Easter Recess – No class**
Mar. 28 (M) Lecture 15: Vision: the eye - II and the central visual system - I (chapter 9 and 10)
Mar. 31(R) Lecture 16: The central visual system - II (chapter 10)
Apr. 4 (M) **EXAM II** (Lectures 9-16)
Apr. 7 (R) Lecture 15: The auditory and vestibular system - I (chapter 11)
Apr. 11 (M) Lecture 16: The auditory and vestibular system - II (chapter 11)
Apr. 14 (R) Lecture 17 *(special): Study of original research articles II (handout)*
Apr. 18 (M) Lecture 18: The somatic sensory system, touch and pain - I (chapter 12)
Apr. 21 (R) Lecture 19: The somatic sensory system, touch and pain - II (chapter 12)
Apr. 25 (M) Lecture 20: Wiring the brain (chapter 23)
Apr. 28 (R) Lecture 21: Molecular mechanisms of learning and memory - I (chapter 25)
May. 2 (M) Lecture 22: Molecular mechanisms of learning and memory - II (chapter 25)
TBD, **2:45 – 4:45 pm**, **Final Exam** (Lectures 15-22)

In The Classroom (from Dr. Mom's Guide to College)
http://www.lions.odu.edu/~kkilburn/dr_mom_home.htm

1. Get to class early. If it's a large classroom, sit front and center – the teacher is likely to learn your face and, if s/he is in the habit of chatting with students before class, may actually learn your name (or at least what your favorite TV show is). (Note: even if you sit in the back, you can also attract the professor's attention by sleeping, reading the paper, and/or eating lunch during lecture– but I don't recommend it).
2. If you must arrive late, come in quietly and sit in the back of the room. If you can't sit on the aisle, sit on the floor – it's better than disrupting the class by crawling over people to find an empty seat.
3. No cell phones or beepers unless your life, or a family member's life, depends on it. Pizza delivery and party plans, strange as this may seem, don't count.
4. Be organized. Know what you need (notebooks, writing instruments, tape recorders, textbooks, etc.) and have it ready to go before the lecture starts.
5. Be quiet. Snapping gum, unwrapping candy, slurping drinks, clicking your pen, wiggling in your seat to make it squeak, etc., are sure ways to make lots of enemies (especially among those of your fellow students who are trying to catch a few well-earned z's during class).
6. Maintain frequent eye contact with the professor. The impression of attentiveness (even when it's faked) will make the professor feel good. And you might just find

that paying attention to her facial expressions and gestures help you absorb the material.

7. Ask questions. A good professor will stop periodically to let students catch up and ask questions. Take advantage of that time. Don't try to show off by asking a question designed to demonstrate how much you know (it's almost certain to be less than you think). Do seek clarification if you're confused (your fellow students who are too shy to ask will thank you later) and do ask about connections between what the professor is talking about and other things you may be learning. If the professor doesn't leave time for questions during class, take advantage of office hours. One caveat: if it's a question about course structure and/or procedures, check the syllabus first – that's why the professor wrote it in the first place.
8. Answer questions. A good professor will let you ask questions. A better professor will ask you questions to see if you're absorbing the material and/or to help you make connections among concepts. Take advantage of that opportunity and try to answer the questions. Be sure to follow the appropriate protocol – don't shout out answers if a show of hands is asked for or if the teacher has called on someone else (but do try to answer the question in your head if that's the case).
9. Unless the teacher is late and your next class is across campus, don't pack up your stuff and leave before you're dismissed. It's rude and disruptive. If you have a teacher who is always late ending class, let her know that you'll need to leave right at the end of class and sit in the back where you won't disturb people on your way out.
10. Introduce yourself to the students who sit next to you. Get the name, phone number and/or e-mail address of at least one other person in the class – someone you'd feel comfortable contacting for information from missed classes or for getting together to study with.
11. Laugh at the teacher's jokes. Always. Just be sure they're jokes.