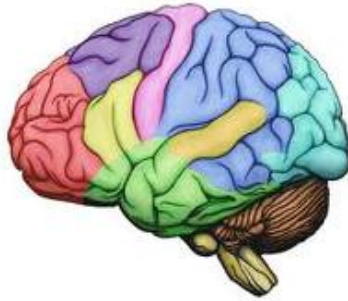


**UNIVERSITY OF VICTORIA
DEPARTMENT OF BIOLOGY**



**Neurobiology: Molecules to Behaviour
Biology 367 A01 -- Spring 2016**

Days & Times: Tuesday/Wednesday/Friday 1:30PM - 2:20PM

Classroom: Clearihue Building, Room CLE A127

Instructor: Dr. Joana Gil-Mohapel, Ph.D. (jgil@uvic.ca)

Office Hours: Medical Sciences Building Room #MSB249.

The hour before each class or by appointment.

About the Instructor:

I am originally from Portugal, where I obtained a B.Sc. with Honours in Biochemistry and a M.Sc. in Cell Biology. I then moved to Sweden, where I completed my Ph.D. in Neuroscience at Lund University. After completing 4 years of post-doctoral training at the Division of Medical Sciences, here at the University of Victoria, I am currently an Assistant Teaching Professor at the Island Medical Program. My research interests include gaining a better understanding on how the brain is affected by neurodevelopmental disorders such as Fetal Alcohol Syndrome and Fragile-X Syndrome, neurodegenerative conditions such as Huntington's disease, and ageing and whether different therapies aimed at promoting brain function (such as the use of endogenous stem cells) can be of therapeutic value. I have co-authored 40 publications in international refereed scientific journals and 15 book chapters on these topics.

About this Course:

BIOL367 will provide an overview of the principles of function of the nervous system. The cellular properties of neurons and how these integrate into neural circuits to produce behaviours and perceptions will be discussed. Throughout the course, examples of neurological dysfunctions will be given to illustrate the functioning and properties of the nervous system.

Topics Covered:

1. Structure of neurons and nervous tissue.
2. Electrical properties of neurons: passive and active.
3. Synaptic transmission between neurons: pre-synaptic and post-synaptic elements.
4. Synaptic plasticity: activity and neuromodulator-dependent processes.

5. Learning and memory: plasticity at the cellular and systems levels.
6. Sensory systems: touch, proprioception, and pain.
7. Motor Systems: motor control and motor system dysfunction (disease and injury).
8. Repair and regeneration in the nervous system: adult neurogenesis.

Required Textbook:

- Purves et al. (2012). *Neuroscience*. 5th Edition. Sunderland, MA: Sinauer Associates Inc.

<http://www.sinauer.com/neuroscience-621.html>

Written Tests:

This course will have two non-cumulative midterms. The dates of the midterms are **29th of January** (test #1; worth **30%** of your final grade) and **4th of March** (test# 2; worth **30%** of your final grade). In addition, there will be a final non-cumulative exam worth 40% of your final grade, which will be scheduled as per the University Exam Schedule. To obtain a passing grade in this course, you will have to write both midterms and the final exam.

The midterms and final exam will have a short-answer format (e.g., drawing or labelling diagrams, filling in blanks or tables and multiple-choice questions). These tests could ask about any material covered in the assigned chapters of the textbook (including figures and summaries) and in the lectures.

I will not answer any questions (by any contact method) within 24 hours of the tests – I have found that such questions are either too late to help or are concerned with details too minor to be worth worrying about. This policy is to encourage you to do your preparation before the night before the test.

Students who miss a midterm with a valid excuse (e.g. illness, family affliction) must show official documentation for the absence and then write a make-up test as scheduled by the instructor. Students who miss tests without a valid excuse will receive a score of zero for that test and will obtain an incomplete course grade.

Students who miss the final exam due to illness, accident, or a family affliction must apply at Records Services for a “*Request for Academic Concession*” within 10 working days of the exam date. Missed exams without a valid reason will result in a score of zero for that test. You should notify the instructor immediately by e-mail.

Evaluation & Grading:

Your final grade will be estimated as follows:

First Midterm (test #1: Jan 29)	30%
Second Midterm (test #2: Mar 4)	30%
Final Exam (TBD)	40%
TOTAL	100%

The final % grade will then be converted into a final letter grade according to the University standard grading system:

A+	(exceptional performance)	90-100%
A	(Outstanding performance)	85-89%
A-	(Excellent performance)	80-84%
B+	(Very good performance)	77-79%
B	(Good performance)	73-76%
B-	(Solid performance)	70-72%
C+	(Satisfactory)	65-69%
C	(Minimally satisfactory)	60-64%
D	(Marginal performance)	50-59%
F	(Failing grade)	0-49%

For incomplete and withdrawal grading policies, see the student handbook for your program.

Tips for success in the course:

1. Come to classes and listen actively. Take notes.
2. During class be engaged and participate. Ask questions and challenge the material. Any psychologist will tell you that the more you engage yourself in the material, the better you will learn it.
3. Read ahead. Simply read the upcoming sections of the text prior to coming to class. By familiarizing yourself with the concepts, terms and issues, you will find the lecture easier to understand and follow. Otherwise you will likely find yourself feeling overwhelmed with the course material.
4. Utilize multiple sources of information. Read all sections of the assigned chapters, including introductory and closing comments. Other neuroscience textbooks (such as: Kandel, Schwartz and Jessel, *Principles of Neuroscience*, or Zigmond et al, *Fundamental Neuroscience*) may also be used as complementary readings. However, it is the student's responsibility to locate and identify the material taught in class in these textbooks.
5. Form a study group. Interaction with others will give you a broader perspective on the material and increase your motivation.
6. Don't cram for the tests. You will find that there is a lot of material in this course. It will be less overwhelming if you learn concepts on a weekly basis.

TENTATIVE SCHEDULE OF TOPICS AND TESTS:

DATE	DAY	TOPIC	READINGS
5-Jan	Tues	<i>Course Orientation</i>	
6-Jan	Wed	Studying the Nervous System	Course Outline
8-Jan	Fri	Electrical Signals of Nerve Cells	Chapters 1-2
12-Jan	Tues	Voltage-Dependent Membrane Permeability	Chapter 3
13-Jan	Wed		
15-Jan	Fri		
19-Jan	Tues	Ion Channels and Transporters	Chapter 4
20-Jan	Wed		
22-Jan	Fri		
26-Jan	Tues	Synaptic Transmission	Chapter 5
27-Jan	Wed		
29-Jan	Fri	Test #1	Chapters 1-5
2-Feb	Tues	Neurotransmitters and their Receptors	Chapter 6
3-Feb	Wed		
5-Feb	Fri		
9-Feb	Tues	READING BREAK	
10-Feb	Wed		
12-Feb	Fri		
16-Feb	Tues	Molecular Signalling Within Neurons	Chapter 7
17-Feb	Wed		
19-Feb	Fri		
23-Feb	Tues	Synaptic Plasticity	Chapter 8
24-Feb	Wed		
26-Feb	Fri		
1-Mar	Tues	Memory	Chapter 31
2-Mar	Wed		
4-Mar	Fri	Test #2	Chapters 6-8, 31
8-Mar	Tues	Sensory Systems: Touch, Proprioception and Pain	Chapters 9-10
9-Mar	Wed		
11-Mar	Fri		
15-Mar	Tues	Movement: Lower Motor Neurons and Upper Motor Neurons	Chapters 16-17
16-Mar	Wed		
18-Mar	Fri		
22-Mar	Tues	Modulation of Movement: Basal Ganglia and Cerebellum	Chapters 18-19
23-Mar	Wed		
25-Mar	Fri		
29-Mar	Tues	Repair and Regeneration in the Nervous System: Adult Neurogenesis	Chapter 25
30-Mar	Wed		
1-Apr	Frid		
TBD*		FINAL EXAM	Chapters 9-10, 16-19, 25

TBD: To be determined according to the University Exam Schedule.

GENERAL EXPECTATIONS:

***Professionalism and Respect for Others.** The instructor and students in this course will act with integrity and strive to engage in appropriate and professional verbal and nonverbal behavior that is mandatory in our profession. Everyone will demonstrate respect for each other. The many factors related to diversity; for example diversity in characteristics such as age, gender, race, culture, background, physical ability, size, sexual orientation, religious preferences, etc. as well as diversity in opinion and experience will be honored at all times. We are dedicated to creating an educational environment that respects diversity and individual differences. Please share in the responsibility of helping us to meet this goal.

***Academic Honesty.** The Psychology Faculty would like to remind you of an important obligation that you bear as psychology students: that of knowing and complying with professional ethics codes and with basic standards of academic honesty and integrity. When writing papers, the sources of all ideas, information and data that are not your original work should be properly referenced and cited. Failure to do so constitutes plagiarism. Also, please keep in mind that it is unethical and inappropriate to submit a piece of work in fulfillment of requirements in more than one course. All acts of dishonesty in any work constitute academic misconduct. The misconduct will be documented and reported, and college policy will be followed.

***Course evaluations.** Students must complete course evaluations. The data are presented to faculty as compiled statistics, graphs, and lists of comments – no student names appear on that list or are disclosed to faculty. Your feedback is critical to quality assurance and to help faculty revise, enhance, or maintain courses, as necessary. Please comment on your experience so that we can continue to provide the highest level of instruction and quality education typical of UVIC.

***Disability Accommodation.** Any requests for special accommodations must be requested and approved prior to or at the beginning of a course. This request must stipulate accommodations to be considered and should be approved IN ADVANCE of receiving the accommodation. Students requiring accommodations are advised to contact the instructor and Student Affairs (Resource Centre for Students with a Disability) as soon as possible to begin the formal request process.

***Policies and Procedures.** Students are responsible for following the policies and procedures outlined in the student handbook of their respective programs, and the UVIC Calendar.