PSYCHOLOGY 543 (A01) Spring, 2017
Behavioural Neuroanatomy

Time: Wednesdays 1:00pm to 2:20pm and Fridays 10:30 to 11:50am.
Room: COR A228
Instructor: Mauricio Garcia-Barrera, Ph.D.
Office: Cornett A274
Office hours: By appointment
Office Phone: 250-472-5067
E-mail: mgarcia@uvic.ca

About the Instructor
I have been a faculty member in the Clinical Psychology Program, Neuropsychology emphasis, at UVic’s Department of Psychology since 2008. I earned my clinical psychology Bachelor at the University of Antioquia (1999), in my home country, Colombia, after which I completed a two-year pre-doctoral training at the Neuroscience Group of Antioquia. I earned my Master’s (2005) and Doctorate (2008) degrees at the University of Georgia. I completed a clinical psychology internship in Neuropsychology. My research aims to better understand executive functioning throughout the developmental lifespan, with an emphasis in its relationship with morphological and functional changes in prefrontal cortex areas. I run a lab named CORTEX, and my current studies involve the effect of physical exercise and sport concussions on executive functioning, and the examination of changes observed in executive control through typical and atypical aging.

About this Course
This neuroanatomy course is designed to provide students with advanced knowledge on the structure and function of the human nervous system. Although the course focus is on typical brain development and functioning, this orientation will be contrasted with neuropathology for a better understanding of typical and atypical brain development and functioning. This course will also provide students with a “hands on” approach to the brain with a wet laboratory training experience, including examination of anatomical findings to foster discussion of brain structure and function.

Prerequisite
In order to benefit from this course, the curriculum committee at the Department of Psychology has established that the prerequisite for this course is PSYC 315B or an equivalent undergraduate human neuropsychology course. I am aware that in some cases this requirement can be waived if you provide evidence of having fulfilled it in another way. If you are not sure, please contact me and we can discuss together ways to make sure you are prepared for this class. Remember the departmental rule of thumb is that:

Students who remain in courses for which they do not have the prerequisites do so at their own risk. Those who complete courses without prerequisites are not exempt from having to complete the prerequisite course(s) at some later date if such courses are required for the degree program.

Textbook for this class

Course Objectives:
As a result of this course, the students will:

1. Identify the gross anatomy of the human central nervous system and cranial nerves;
2. Specify the location of basic brain structures and functions;
3. Describe neurobiological processes involved in brain functions and systems;
4. Recognize characteristics of typical and atypical brain development and function;
5. Study brain-behavior relationships based on clinical cases.
**Course Requirements:**

1. I highly recommend you attend all classes. I strongly believe that learning is an active process, so I personally expect you to come prepared and to actively participate in class discussions.

2. You will have the opportunity to present a few neuropsychological cases throughout the term. I will schedule the presentations one week in advance so that you will have time to prepare.

3. Evaluations are an opportunity for you to display your knowledge and to think in a constructive way about your readings and class discussion. There are two take-home assignments in lieu of exams and a final cumulative evaluation.

**Evaluation and Grading Policy**

Grading in this class is based on a point system than is then converted into the University standard grading system. Every student has the opportunity to earn up to 100 points. These points are distributed as follows:

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Points</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Presentation and Discussion of Case Studies</td>
<td>20 points</td>
<td>20%</td>
</tr>
<tr>
<td>Neuroanatomy Wet Labs (Feb 22, &amp; March 24, 2017)</td>
<td>10 points</td>
<td>10%</td>
</tr>
<tr>
<td>Assignment #1 (February 24th, 2017)</td>
<td>20 points</td>
<td>20%</td>
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<tr>
<td>Assignment #2 (March 24th, 2017)</td>
<td>20 points</td>
<td>20%</td>
</tr>
<tr>
<td>Final exam (Scheduled by the University)</td>
<td>30 points</td>
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**Total**

100 points (100%)

The final letter grade in the course will be based on the total of points earned during the semester, as follows:

- **A+** (Exceptional work) = 90 - 100 points 90-100%
- **A** (Outstanding work) = 85 - 89 points 85-89%
- **A-** (Excellent work) = 80 - 84 points 80-84%
- **B+** (Very good work) = 77 – 79 points 77-79%
- **B** (Acceptable work) = 73 – 76 points 73-76%
- **B-** (Unacceptable work) = 70 – 72 points 70-72%
- **C+** (Unacceptable work) = 65– 69 points 65-69%
- **C** (Unacceptable work) = 60 – 64 points 60-64%
- **D** (Unacceptable work) = 50 – 59 points 50-59%
- **F** (Failing grade) = 0 -49 points

**In-Class Student Case Presentations**

You will be invited to form groups of 2. On some of our sessions (see schedule below), students will present and discuss clinical cases pertinent to the topics covered on the previous lecture. Students will be evaluated based on their preparation, participation, and presentation. More information about the presentation guidelines will be given during the first weeks of classes. Every student will have the opportunity to lead the presentation of at least one case. The presentations are worth a total of 20 points (20%).

**Neuroanatomy Wet Labs**

Students will gain hands on experience, and discuss structure and function, during two neuroanatomy wet lab sessions. Students will receive worksheets at the beginning of each lab session that should be completed by the end of class. As part of the worksheet, students will be asked to describe some of the brain structures present in the anatomical specimens. These labs will take place at the Vancouver Island Medical School in campus, and are scheduled for February 22nd & March 24th, 2017. Each completed lab worksheet is worth up to 5 points (5%) for a total of 10 points (10%).

**Assignment #1**

Students will be provided with a case study a week before the due date of the assignment. The case study will require the student to apply knowledge from the course content covered so far. Emphasis will be placed on how the student came to the solution through evidence provided. Students are expected to work on their own to come-up with their solution to the case. Assignments should not be longer than 1000 words. This assignment will be due on February 24th, 2017 and it is worth 20 points (20%).

**Assignment #2**

Students will choose two neurological conditions from a list provided by the instructor and will draw comparisons between both focusing on the brain structures affected in each and how these translate into the characteristic
symptomatology of each disease. Students are expected to go beyond the textbook and research primary literature when writing this assignment. Assignments should not be longer than 1500 words. This assignment will be due on March 24th, 2017 and it is worth 20 points (20%).

Final Exam
I generally do not conduct final evaluations in my graduate courses. However, I found neuroanatomy to be rich in terminology, systems, interactions, and classifications. In order to further evaluate how well you have met the course objectives, a final (cumulative but selective) exam will be conducted. The final exam is worth 30 points (30%).

Some important housekeeping rules:

Students are expected to familiarize themselves with the Important Course Policy Information (attached) and are responsible for checking and correcting their registration status before the Add/Drop deadlines.

The University of Victoria is committed to promoting, providing and protecting a positive and supportive and safe learning and working environment for all its members. I welcome diversity of perspectives and opinions in my courses, and I expect all students to respect their peers positions.

I expect you to come to the exams on the dates they are scheduled. Make-up exams are only given if a physician’s note documents an illness, or through a “Request for Academic Concession” from the Records Services office in campus if you need additional time to complete course requirements due to calamity, family affliction, or other such reasons. Unfortunately, if you cannot provide these documents, I will have to assign a total of zero (0) points to the test, and will calculate the letter grade accordingly. Similarly, I expect you to conduct the case presentation at the scheduled time, unless documentation is otherwise provided.

Tentative Schedule of Topics

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>January 6, 11</td>
<td>Introduction to the course and overview of syllabus</td>
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<tr>
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<td><strong>Neuroanatomy Overview &amp; Basic Definitions</strong></td>
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<td>We will discuss the nervous system’s macroscopic organization, including the main systems and their components. An emphasis will be placed on the Central Nervous System.</td>
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<tr>
<td></td>
<td>*Reading: Blumenfeld –Chapter 2</td>
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<td>January 13</td>
<td><strong>Review of Neuroimaging Techniques</strong></td>
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<td>In this session, we will discuss the most commonly used structural and functional neuroimaging methods in neuropsychological research. Emphasis will be placed in how these methods inform us about behavioural neuroanatomy and clinical applications.</td>
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<td>*Reading: Blumenfeld –Chapter 4</td>
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<td>January 18, 20*</td>
<td><strong>Meninges, Cerebospinal Fluid &amp; Blood-Brain Barrier</strong></td>
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<td>During this class, we will discuss the structural and functional characteristics of each of the compartments that encapsulate and protect the brain. Emphasis will be placed in their normal anatomy and how injury or illness may affect these systems.</td>
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<td>*Reading: Blumenfeld –Chapter 5</td>
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<td><strong>Case presentations by the students (Drew &amp; Vanessa) – chapter 5 cases</strong></td>
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| January 25, 27* | **Corticospinal Tract, Motor Pathways and Somatosensory Pathways**  
During this session, we will discuss the output (efferent) systems that control movement and action and the input (afferent) systems that control sensations such as touch, pain, and positions of the limbs in space. Emphasis will be placed in how to applied this knowledge to aid in the mapping of a lesion localization.  

*Readings: Blumenfeld –Chapters 6 & 7  
*Case presentations by the students (Abbi & Chantel) chapters 6 & 7 cases |
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<tr>
<td>February 1, 3</td>
<td>International Neuropsychological Society Annual Conference – New Orleans</td>
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| February 8, 10* | **Cerebral Hemispheres and Vascular Supply**  
We will review the anatomy and divisions of the cerebrovascular system with and emphasis on the vascular territories of the main cerebral arteries.  

*Reading: Blumenfeld –Chapter 10  
* Case presentations by the students (Robert & Ryan) - chapter 10 cases |
| February 13 - 17 | -Reading Break- |
| February 22*, 24 | *Wet-Lab - Medical Sciences Building, MSB 310  
**Visual System**  
We will review the functional anatomy of the pathways that carry visual information from the retina in the eye to the visual cortex. How vision may be affected due to damage in specific localization will be an emphasis on this session.  

*Reading: Blumenfeld –Chapter 11  
Your first assignment is due on February 24 |
| March 1*, 3 | *Case presentations by the students (Jamie & Angela) - chapter 11 cases  
**Cerebellum, Pituitary & Hypothalamus**  
WE will start by reviewing the cerebellar structure, connectivity and functionality, followed by a brief review of the neuroendocrine functions of the hypothalamus and the pituitary.  

*Readings: Blumenfeld –Chapters 15 & 17 |
| March 8, 10* | **Basal Ganglia**  
We will discuss anatomy and functional connectivity of the basal ganglia, with an emphasis on its relation to other dopamine systems and the clinical symptoms observed when there is disruption to any of its components.  

*Reading: Blumenfeld –Chapter 16  
*Case presentations by the students (Kristen & Rebecca) - chapter 16 cases |
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<tr>
<th>Date</th>
<th>Topic</th>
<th>Details</th>
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| March 15, 17 | Limbic System                                                         | We will discuss the range of components that are part of the limbic system, with an emphasis on their role in emotion and memory.  
Reading: Blumenfeld – Chapter 18 |
|            | Brain Stem: Surface Anatomy and Cranial Nerves                         | Internal Structures and Vascular Supply                                  
We will review the structure of the brainstem, with an emphasis on its role in consciousness, attention, and other functions. We will also discuss the cranial nerves.  
Readings: Blumenfeld – Chapters 12 & 14 |
| March 22, 24* | Higher-Order Cerebral Function: Cerebral Lateralization, Dominant & Non-dominant Hemispheres | We will discuss the principles of lateralization of function, with an emphasis on the neuroanatomy of language systems and related functions.  
Reading: Blumenfeld – Chapter 19 (pp. 880-905) |
|            | * Wet-Lab - Medical Sciences Building, MSB 310                        | Your second assignment is due on March 24                               |
| March 29, 31 | Higher-Order Cerebral Function: Frontal Lobes, Consciousness, Attention & Awareness | In this second session, we will discuss the anatomy and functions of the anterior part of the brain, including the Frontal Lobes and Prefrontal Cortex, and their role in cognition and other processes. |

**Important Information**

**Academic Honesty:** The Psychology Faculty would like to remind you about an important obligation to keep in mind- that of knowing and adhering with professional ethical standards and principles regarding academic honesty and integrity. When writing papers, the sources of all ideas, information and data that are not original to you should be properly referenced and cited. Failure to do so constitutes plagiarism. As well, 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. This misconduct will be documented and reported, according to university policy.

The Department of Psychology fully endorses and shall enforce rigorously the Senate Policy on Academic integrity ([http://web.uvic.ca/calendar2017-01/grad/academic-regulations/academic-integrity.html](http://web.uvic.ca/calendar2017-01/grad/academic-regulations/academic-integrity.html)). It is important that students who do their work honestly are protected from those who do not. Because this policy is in place to ensure that students carry out and benefit from the learning activities assigned in each course, it is expected that students shall cooperate in its implementation.
Course evaluations:  To help faculty refine out teaching procedures through revisions and enhancements, and also to ensure faculty accountability, students must complete course evaluations. Please give your candid feedback during the course evaluations so that we can continue to provide the highest level of instruction and quality education typical of UVic. The data are presented to faculty as compiled statistics, graphs, and lists of comments after completion of the course and submission of grades- no student names or other personally identifying information are disclosed to faculty.

Disability accommodation:  Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health concern that may require accommodations, please feel free to contact the Resource Centre for Students with a Disability (RCSD) as soon as possible. Staff at the RCSD are available by appointment to advise students and assess specific needs among addressing a host of disability-related issues. To learn more, please go to www.rcsd.uvic.ca.