BEHAVIOURAL NEUROSCIENCE by CLAUDE MESSIER

PSY-3301A, FALL 2014

NO OFFICE HOURS. I AM ON CAMPUS MOST OF THE TIME ON WEEKDAYS. PLEASE E-MAIL FOR AN APPOINTMENT.

EMAIL: CMESSIER@UOTTAWA.CA

All questions sent by email will receive a response within two working days or by the next class if it takes place within the 48 hours following your email. Please note that I reserve the right to not respond to an email if the language is not appropriate (or if I am dead).

BLACKBOARD

All the course material is available on Blackboard.

TEACHING ASSISTANT: ANTHONY MURKAR, amurk054@uottawa.ca

OFFICIAL COURSE DESCRIPTION

From the Undergraduate Calendar: Neural communication and synaptic integration. Biochemistry and pharmacology of synaptic transmission. Brain mechanisms underlying reward and punishment, aggression, memory and sleep-waking processes.

COURSE CONTENT

- GENERAL OBJECTIVES
  The aim of this course is to develop a good knowledge of some of the organizing principles of brain and how the brain generates behaviour (including cognition and emotion). Secondary goals are to develop a basic knowledge of human neuroanatomy, develop a better understanding of brain research techniques in animals and humans and examine some of the current ideas about the brain and self.

TEACHING METHODS
TEACHING METHODS AND LEARNING ACTIVITIES

The course uses a number of in-class activities to improve the chances that your brain will be trained to the best level you can achieve. Similar to a gym workout, your progress depends on regular exercise done at an optimal intensity. For PSY-3301, your brain training activities include:

1) Getting acquainted with the basic material in the textbook or other readings before the class presentation by the professor. In order to ensure that home training goals are met, there will be a short 5-question quiz at the beginning of each class. These are questions with no more than a few lines for each answer. Questions are designed to verify if the readings have been done with sufficient intensity. According to the latest research, this is the best way to build up your cortical circonvolutions (Pennebaker, 2013 #16714).

2) Neuroanatomy self-learning to understand how the brain is organized: These quizzes will be based on the Digital Anatomist (Interactive Brain Atlas) web site: http://da.biorstr.washington.edu/cgi-bin/DA/PageMaster?atlas:Neuroanatomy+ffpathIndex:Splash^Page+2
   If this link does not work for you, just google the atlas. For each picture, there is a quiz mode. Participants will be asked to answer quizzes in which they identify brain structures from brain slices or MRI scans. Students will choose randomly to answer the quizzes at each class. This is based on the following argument: All of psychology concepts are ultimately subserved by the brain – thus a good knowledge of brain parts is essential. Doing a Psychology program of study without acquiring this knowledge is like wanting to become a car mechanic without learning the parts that make up a car.

3) Short oral presentations: Each of you will present 5-min exposés on a topic of your choice but taken from a list provided by me. This is to practice your communication skills so that you can tell your friends about what you are learning in this course.

4) A Short 2-page double-space essay: Again, a practice of your communication skills. A list of topics will be provided and I expect you will consult at least 5 science articles to prepare them.


Note: Use of computing devices (laptop, tablet and phones) are discouraged during classes – this is for your own benefit and that of your classmates: Mueller, Pam A., and Daniel M. Oppenheimer. "The Pen Is Mightier Than the Keyboard Advantages of Longhand Over Laptop Note Taking." Psychological science (2014): 0956797614524581.

GRADING METHODS AND ASSESSMENT CRITERIA

<table>
<thead>
<tr>
<th>Grading Tool</th>
<th>Weight</th>
<th>Deadline</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-class quizzes</td>
<td>40%</td>
<td>Every class</td>
</tr>
<tr>
<td>Neuroanatomy</td>
<td>30%</td>
<td>Every class</td>
</tr>
<tr>
<td>Paper</td>
<td>20%</td>
<td>Two weeks after oral presentation</td>
</tr>
<tr>
<td>Oral presentation</td>
<td>10%</td>
<td>Every class</td>
</tr>
</tbody>
</table>

INSTRUCTIONS FOR THE PAPER AND THE ORAL PRESENTATION CAN BE FOUND AT THE END OF THE SYLLABUS (BELOW). YOU HAVE TO SIGN UP FOR YOUR ORAL PRESENTATION TOPIC ON THE FIRST DAY OF CLASS.
**Course Schedule**

1) September 6:
Presentation of the syllabus
First contact with Digital Anatomist
Topic of formal presentation: Overview of brain function and structure (Pages 34-44, first paragraph)

2) September 9:
Digital Anatomist neuroanatomy quiz: Sagittal forebrain MRI: L 57.2 ; L54.6 ; L52.0
Material for in-class quizzes: Overview of brain function and structure (Pages 34-44, first paragraph)
Topic of formal presentation: Central nervous system: Mediating behavior (Pages 50-60)

3) September 11:
Digital Anatomist neuroanatomy quiz: Sagittal forebrain MRI: L49.4 ; L46.8 ; L44.2
Material for in-class quizzes: Central nervous system: Mediating behavior (Pages 50-60)
Topic of formal presentation: Brain plasticity-1 (Chapter 5-4 pages 164-170)

4) September 16:
Digital Anatomist neuroanatomy quiz: Sagittal forebrain MRI: L41.6 ; L39.0 ; L36.4
Material for in-class quizzes: Chapter 5-4 pages 164-170
Topic of formal presentation: Brain plasticity-2 (Chapter 14-4 pages 502-514)

5) September 18: Digital Anatomist neuroanatomy quiz: Sagittal forebrain MRI: L33.8 ; L31.2 ; L28.6
Material for in-class quizzes: Brain plasticity: Chapter 14-4 pages 502-514
Topic of formal presentation: Brain and Behavior animal studies: anatomical and physiological methods.

6) September 23:
Digital Anatomist neuroanatomy quiz: Brain surface: Sagittal forebrain MRI: L26.0 ; L23.4 ; L20.8
Material for in-class quizzes: Chapter 7-1 pages 213-221 ; Chapter 7-5 pages 235-237
Topic of formal presentation: Brain and Behavior animal studies: behavioural methods.

7) September 26:
Digital Anatomist neuroanatomy quiz: Sagittal forebrain MRI: L18.2 ; L15.6
Material for in-class quizzes: Chapter 7 pages 222-233
Topic of formal presentation: Brain and Behaviour human studies: anatomical and physiological methods

8) September 30:
Digital Anatomist neuroanatomy quiz: Sagittal forebrain MRI: L13.0 ; L10.4
Material for in-class quizzes: On Blackboard: Unraveling the Neuropsychological Assessment

9) October 2:
Digital Anatomist neuroanatomy quiz: Sagittal forebrain MRI : L7.8
Material for in-class quizzes: Chapter 12: pages 422-427; Chapter 16, 599-602
Topic of formal presentation: Variety of brain states: depression, anxiety

10) October 7: Oral presentations

11) October 9:
Digital Anatomist neuroanatomy quiz: Sagittal forebrain MRI : L5.2
Material for in-class quizzes: Chapter 6: pages 207-208; Chapter 16, pages 566-568; Chapter 7, 241.
Topic of formal presentation: Variety of brain states: PTSD, ADHD

Reading week: no class on October 14 & 16

12) October 21:
Digital Anatomist neuroanatomy quiz: Sagittal forebrain MRI : L2.6
Material for in-class quizzes: Chapter 6, pages 181-192
Topic of formal presentation: History of pharmacological treatments for the brain

13) October 23:
Digital Anatomist neuroanatomy quiz: Sagittal forebrain MRI : L0.0
Material for in-class quizzes: Chapter 6, pages 181-191
Topic of formal presentation: Long-term effects of pharmacological treatments

14) October 28:
Digital Anatomist neuroanatomy quiz: Horizontal forebrain: hypothalamus
Material for in-class quizzes: Blackboard: « Animal models of neuropsychiatric Disorders »
Topic of formal presentation: Limitations of animal behavioural models for brain disease

15) October 30:
Digital Anatomist neuroanatomy quiz: Horizontal forebrain: substantia nigra
Topic of formal presentation: Impact of the rest of the body on brain functions.

16) November 4:
Digital Anatomist neuroanatomy quiz: Horizontal forebrain: anterior commissure
Topic of formal presentation: The body representation in the brain: from being here to out-of-body experiences.
17) November 6:
Digital Anatomist neuroanatomy quiz: Horizontal forebrain : thalamus
Material for in-class quizzes: Blackboard : « Imagining being the agent of actions that carry different moral consequences: An fMRI study » - Introduction, discussion and conclusion sections only.
Topic of formal presentation: I feel your pain : the brain mechanisms of empathy and social interactions

18) November 11: Oral presentations

19) November 13:
Digital Anatomist neuroanatomy quiz: Horizontal forebrain : Fimbria Fornix
Material for in-class quizzes: Blackboard : « Seeing Colourful Words: A Brief Look at Language-Related Synaesthesia » Section 4 and 5
Topic of formal presentation: The variety of human perception : Synesthesia

20) November 18:
Digital Anatomist neuroanatomy quiz: Coronal forebrain : MRI+Slab Optic chiasm
Material for in-class quizzes: Blackboard : « Conscious motor intention emerges in the inferior parietal lobule »
Topic of formal presentation: From « I want to do this » to « I need to do this », the progression of voluntary movement and free will

21) November 20:
Digital Anatomist neuroanatomy quiz: Coronal forebrain : MRI+Slab Anterior commissure
Material for in-class quizzes: Blackboard : « Stress in the City » ; « Urban decay »
Topic of formal presentation: Stress, social environment and mental illness

22) November 25: Possible class to complete oral presentations
Digital Anatomist neuroanatomy quiz: Coronal forebrain : MRI+Slab interventricular foramen
Material for in-class quizzes: TBA
Topic of formal presentation: TBA

23) November 27: Possible class to complete oral presentations
Digital Anatomist neuroanatomy quiz: Coronal forebrain : MRI+Slab substantia nigra
Material for in-class quizzes: TBA
Topic of formal presentation: TBA

24) December 2:
Digital Anatomist neuroanatomy quiz: Coronal forebrain : MRI+Slab Posterior commissure
Material for in-class quizzes:
Topic of formal presentation: Unusual brain syndrome (Capgras, Cotard, Morgellon’s, etc)

***There can be shifts in the schedule, depending on the pace of the course.
INSTRUCTIONS FOR ORAL PRESENTATION:

1) This is a 5-minute presentation: I will signal you 30 sec before the end of the presentation so that you can wrap up the presentation.
2) You can use up to 5 slides in PowerPoint as a presentation aid.
3) You have to choose one topic from the “disorder list” word file on Blackboard.
4) You will sign up for your topic on the first class. Only one student presents on one topic. You have to sign up for the date on which you will present.
5) The goal of the presentation is to provide an overview of the disease and point out the brain functions that are impaired and the brain areas most affected.
6) You can add video clips to present an example of the disorder but they take part of your 5-min allotment so they should be very short <30 sec. A video clip is the equivalent of one PowerPoint slide.
7) Although this is not compulsory, I would suggest you don’t read your presentation but rather do it with only the help of the PowerPoint.
8) Marking scheme: Visual presentation (2 pts); organization of presentation (2 pts); covers the important material (2 pts); clear voice – no mumbling (2 pts); respects time limit (2 pts).

INSTRUCTIONS FOR 2-PAGE PAPER

1) This is a 2-page single space paper.
2) The paper is due on the last class of the semester – no exceptions.
3) The topic of the paper is taken from the “Disorder List” but it is different from your oral presentation. There is no restriction on how many students can choose a particular topic.
4) You have to consult and cite 5 (five) scientific papers (those who have an intro, methods, results and discussion).
5) The aim of the paper is to present the disorder (approx 1 page – depends on the complexity of the disorder) and associate the symptoms to brain areas or components (approx 1 page - depends on the complexity of the neural bases). If the symptoms are not very numerous, then you can go in more details on how these differ between individuals. If there are treatments, explain what they do to the brain.
6) Marking scheme:
   A) Originality of content (10 pts): The paper is not a copy paste of websites but an integration of at least 5 sources. The pdf of the 5 sources have to be submitted with your 2-pager.
   B) Organization of paper (4 pts): There is a clear organization with the different parts are well identified.
   C) Comprehensive (4 pts): The paper covers the disorder in enough details and the brain areas involved are clearly identified.
   D) Layout, Readability and Language (2 pts): Don’t cram the 2 pages, identify sections and topics within the 2 pages with headers and titles. There is no valid excuse for poor grammar and spelling.
All suggested readings are found on the Blackboard site for the course.

Resources for you

FACULTY MENTORING CENTRE - http://socialsciences.uottawa.ca/mentoring
The goal of the Mentoring Centre is to help students with their academic and social well-being during their time at the University of Ottawa. Regardless of where students stand academically, or how far along they are in completing their degree, the Mentoring Centre is there to help them continue on the path to success.
A student may choose to visit the Mentoring Centre for very different reasons: talking to older peers to gain insight into programs and services offered by the University, or to simply brush up on study skills (time management, note-taking, exam preparation, etc.)
In sum, at the Mentoring Centre, you can discuss all things academic and everything about life on campus with mentors who are social science students themselves and trained to answer all your questions.

ACADEMIC WRITING HELP CENTRE http://www.sass.uottawa.ca/writing
The Academic Writing Help Centre provides free, individualized help and advice for writing academic assignments. With the help of our advisors, you learn to correct your errors, to write well independently, to improve your critical analysis and to sharpen your argumentation skills—everything you need to master the official language of your choice.

CAREER SERVICES http://www.sass.uottawa.ca/careers
This unit provides an array of career-development services and resources designed to help students identify and put forward the critical skills they need to enter the work force.

COUNSELLING-SERVICE http://www.sass.uottawa.ca/personal/
There are many reasons to call on the Counseling Service, including:

- personal counselling
- career counseling
- study skills counseling.

ACCESS SERVICE http://www.sass.uottawa.ca/access/
The University has always strived to meet the needs of individuals with learning disabilities or with other temporary or permanent functional disabilities (hearing/visual impairments, sustained health issues, mental health problems), and the campus community works collaboratively so that you can develop and maintain your autonomy, as well as reach your full potential throughout your studies. You can call on a wide range of services and resources, all provided with expertise, professionalism and confidentiality.

If barriers are preventing you from integrating into university life and you need adaptive measures to progress (physical setting, arrangements for exams, learning strategies, etc.), contact the Access Service right away:

- in person at the University Centre, Room 339
- online at http://www.sass.uottawa.ca/access/registration
- by phone at 613-562-5976

Deadlines for submitting requests for adaptive measures during exams

- midterms, tests, deferred exams: seven business days before the exam, test or other written evaluation (excluding the day of the exam itself)
- final exams:
  - November 15 for the fall session
  - March 15 for the winter session
  - Seven business days before the date of the exam for the spring/summer session (excluding the day of the exam itself).

Student Resources Centre - http://www.communitylife.uottawa.ca/en/resources.php
These centres strive to meet all sorts of student needs.
NOTE REGARDING INTEGRITY IN ESSAYS AND ASSIGNMENTS

This is a compulsory notice.

Be aware of academic fraud!

Academic fraud consists of dishonest and wrongful acts on exams, tests or assignments, resulting in flawed grades and assessments. The University does not tolerate academic fraud, and anyone found guilty of this behaviour is liable to severe penalties. Here are some examples of academic fraud:

- Plagiarizing or cheating in any way
- Presenting falsified research data;
- Submitting an assignment of which you are not the sole author
- Presenting the same work from another course without written permission from the professors concerned.

With the development of the Internet these past years, it has become much easier to detect plagiarism. Indeed, given the powerful tools now at their disposal, your professors can, by typing a few simple words, readily trace the exact source of a text on the Web.

For more information on fraud and how to avoid it, you can refer to the Faculty web page, which offers tips to help you with your studies and the writing process for university-level projects at the following address: http://www.socialsciences.uottawa.ca/eng/ugrad_tips.asp. You can also refer to the Faculty web page for information on plagiarism in university assignments: http://www.socialsciences.uottawa.ca/eng/ethics.asp

Persons who commit or try to commit academic fraud, or who are accomplices in fraud, will be penalized. Here are some of the possible sanctions:

- a grade of F for the assignment or course in question
- the imposition of three to 30 more credits as a condition of graduation
- suspension or expulsion from their faculty.

To consult the regulation, see section 14.2 of the Academic Regulations
<table>
<thead>
<tr>
<th></th>
<th>100%</th>
<th>90%</th>
<th>80%</th>
<th>70%</th>
<th>60%</th>
<th>50%</th>
<th>40%</th>
<th>30%</th>
<th>25%</th>
<th>20%</th>
<th>15%</th>
<th>10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>90-100</td>
<td>81-90</td>
<td>72-80</td>
<td>63-70</td>
<td>54-60</td>
<td>45-50</td>
<td>36-40</td>
<td>27-30</td>
<td>22.5-25</td>
<td>18-20</td>
<td>13.5-15</td>
<td>9-10</td>
</tr>
<tr>
<td>A</td>
<td>85-89</td>
<td>76.5-80.1</td>
<td>68-71.2</td>
<td>59.5-62.3</td>
<td>51-53.4</td>
<td>42.5-44.5</td>
<td>34-35.6</td>
<td>25.5-26.7</td>
<td>21.25-22.25</td>
<td>17-17.8</td>
<td>12.75-13.4</td>
<td>8.5-8.9</td>
</tr>
<tr>
<td>A-</td>
<td>80-84</td>
<td>72-75.6</td>
<td>64-67.2</td>
<td>56-58.8</td>
<td>48-50.4</td>
<td>40-42</td>
<td>32-33.6</td>
<td>24-25.2</td>
<td>20-21</td>
<td>16-16.8</td>
<td>12-12.6</td>
<td>8-8.4</td>
</tr>
<tr>
<td>B+</td>
<td>75-79</td>
<td>67.5-71.1</td>
<td>60-63.2</td>
<td>52.5-55.3</td>
<td>45-47.4</td>
<td>37.5-39.5</td>
<td>30-31.6</td>
<td>22.5-23.7</td>
<td>18.75-19.75</td>
<td>15-15.8</td>
<td>11.25-11.9</td>
<td>7.5-7.9</td>
</tr>
<tr>
<td>B</td>
<td>70-74</td>
<td>63-66.6</td>
<td>56-59.2</td>
<td>49-51.8</td>
<td>42-44.4</td>
<td>35-37</td>
<td>28-29.6</td>
<td>21-22.2</td>
<td>17.5-18.5</td>
<td>14-14.8</td>
<td>10.5-11.1</td>
<td>7-7.4</td>
</tr>
<tr>
<td>C+</td>
<td>65-69</td>
<td>59.4-62.1</td>
<td>52.8-55.2</td>
<td>46.2-48.3</td>
<td>39.6-41.4</td>
<td>33-34.5</td>
<td>26-27.6</td>
<td>19.8-20.7</td>
<td>16.5-17.25</td>
<td>13-13.8</td>
<td>9.9-10.4</td>
<td>6.6-6.9</td>
</tr>
<tr>
<td>C</td>
<td>60-64</td>
<td>54-57.6</td>
<td>48-52</td>
<td>42-45.5</td>
<td>36-39</td>
<td>30-32.5</td>
<td>24-25.6</td>
<td>18-19.5</td>
<td>15-16.25</td>
<td>12-12.8</td>
<td>9-9.8</td>
<td>6-6.5</td>
</tr>
<tr>
<td>D+</td>
<td>55-59</td>
<td>49.5-53.1</td>
<td>44-47.2</td>
<td>38.5-41.3</td>
<td>33-35.4</td>
<td>27.5-29.5</td>
<td>22-23.6</td>
<td>16.5-17.7</td>
<td>13.75-14.75</td>
<td>11-11.8</td>
<td>8.25-8.9</td>
<td>5.5-5.9</td>
</tr>
<tr>
<td>D</td>
<td>50-54</td>
<td>45-48.6</td>
<td>40-43.2</td>
<td>35-37.8</td>
<td>30-32.4</td>
<td>25-27</td>
<td>20-21.6</td>
<td>15-16.2</td>
<td>12.5-13.5</td>
<td>10-10.8</td>
<td>7.5-8.1</td>
<td>5-5.4</td>
</tr>
<tr>
<td>E</td>
<td>40-49</td>
<td>36-44.1</td>
<td>32-39.2</td>
<td>28-34.3</td>
<td>24-29.4</td>
<td>20-24.5</td>
<td>16-19.6</td>
<td>12-14.7</td>
<td>10-12.25</td>
<td>8-9.8</td>
<td>6-7.4</td>
<td>4-4.9</td>
</tr>
<tr>
<td>F</td>
<td>0-39</td>
<td>0-35.1</td>
<td>0-31.2</td>
<td>0-27.3</td>
<td>0-23.4</td>
<td>0-19.5</td>
<td>0-15.6</td>
<td>0-11.7</td>
<td>0-9.75</td>
<td>0-7.8</td>
<td>0-5.9</td>
<td>0-3.9</td>
</tr>
</tbody>
</table>