

# PSYCHOLOGY 365 - Section 001

## Cognitive Neuroscience

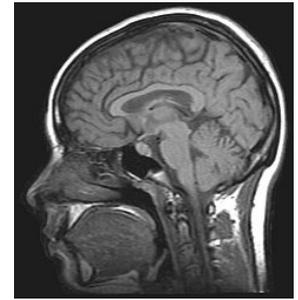
3 credits

University of British Columbia, Vancouver

Spring 2015

MWF 11:00A - 12:00P

Geography 100



**Instructor:** Dr. Michael Souza ("sues-uh")

**E-mail:** souza@psych.ubc.ca

**Office Hours:** Tuesdays 1P-3P in CIRS 4336

\*shared between my PSYC 208 and 365 courses

**TA:**

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**Office Hours:**

Thurs. 100P-200P in Kenny 3508

### I. About your instructor and teaching assistants (TAs)



**Dr. Souza** is a faculty member in Psychology. He received his Ph.D. in Psychology from Berkeley. His interests revolve around higher-order cognitive functions, neurological injury and rehabilitation. He is also interested in fostering opportunities that promote student development.

**Melanie** is a Behavioral Neuroscience graduate student in the Department of Psychology. She received her BA (Honours) from UBC. Her research focuses on Parkinson's Disease and developing a better understanding of the molecular basis for various treatments.

**Nick** is a Cognitive Science graduate student in the Department of Psychology. He uses EEG to study neural networks associated with conscious and unconscious action and perception. Nick's primary topics of interest are attention, consciousness, reading, and dyslexia.

### II. Course description and goals

One of the most fascinating aspects in psychology is examining how the brain gives rise to the mind and how the mind gives rise to thought and action. In this course, we will explore components of human cognition (e.g., attention, memory, executive functions) by using research from neuroimaging (e.g., fMRI, TMS), neurophysiology, and patient populations.

After successful completion of this course, you should have:

- developed knowledge about the link between neuroanatomy and a number of cognitive processes;
- practiced applying how a range of neurocognitive tools (e.g., fMRI) can be used to ask rigorous scientific questions in the context of cognitive neuroscience;
- synthesized what you've learned across the major cognitive domains to better appreciate the highly integrative nature of cognitive processes;
- a clearer understanding of where the "cutting edge" is across a variety of cognitive domains;
- developed experience consuming and understanding primary literature in cognitive neuroscience

### III. Required textbook

There is no textbook for this course. Instead, we will be reading original research articles. A full list of the articles and their associated topics can be found on the last couple of pages of the syllabus.

### IV. Course webpage

<http://elearning.ubc.ca/connect/> (location for important announcements, lecture slides and grades)

### V. Course requirements

#### **Midterm Examinations I & II (26% for MT1 and 34% for MT2 = 60% of course grade)**

Each midterm will consist of short-answer and multiple-choice questions. Short-answer questions may require a several sentence response based on the question complexity and may also require the creation of a visual aid (e.g., diagram). Short-answer questions will be weighted based on difficulty – not all questions will be worth the same number of points. Multiple-choice questions will have with five options each and these questions may come in various formats, including (but not limited to) questions with diagrams and “all of the above” or “none of the above” options. There will be more of a focus from lecture versus the readings but for superior performance, you must have a clear understanding of both lecture and the readings.

#### **Cumulative Final Examination (40% of course grade)**

The Final will be structurally similar to the midterms but it will be cumulative and longer. For the Final, every lecture is fair game but only readings after MT2 will be testable. There will be more of a focus from lecture versus the readings but to perform well, you must have a clear understanding of both lecture and the textbook. **Please note: the date of the final is not announced by the University until mid-February. You should NOT make travel plans until you learn the date of your final exams. You CANNOT take the final at a different date/time unless you have a verifiable medical reason.**

### VI. Research participation (extra credit opportunity)

In addition to your exam scores, you have the opportunity to earn up to three (3) extra percentage points on your overall final grade by participating in studies regularly conducted by the Psychology Department and coordinated through the human subject pool (HSP). This provides the valuable opportunity to observe the research process directly and to contribute to the ongoing research activities at UBC. The extra grades are obtained by signing up for the Introductory Psychology Subject Pool through their web site: <https://hsp.psych.ubc.ca/>. **Please note that any inquiries about credits should be directed to HSP or the experimenters that you worked with, \*not\* the instructor.**

One percentage point is assigned to your final grade for each hour of participation and partial credits will be rounded down (i.e., 1.5 hours = 1% extra credit). Credits can be recorded and tracked via the subject credit website. These credits are added to your grade at the end of the course. Make sure that you retain your portion of the experimental credit receipt in the event that verification of participation is required when the final grades are compiled. If you do not correctly assign your credits to this course, you will NOT receive credit so please make sure you have done this correctly.

As an alternative to participating in studies, you may choose to complete library writing projects, in which you read and summarize a research article; each article summary counts as one hour of research participation. You must select a research article (not a letter to the editor, commentary, or review paper) published between 2000-present in the journal *Psychological Science*. Each summary should be about 500 words and should include the purpose, method and results of the study. Students should submit their assignments on TurnItIn, to class ID 9183443, entitled "Psychology HSP (Winter 2015)", password "research". For more information, please visit: <http://psych.ubc.ca/internal/human-subject-pool/>

The last day to earn and assigned HSP credits is the final day of classes (April 10, 2015).

Please note: no other extra credit opportunities are available for this course.

## VII. Course grading

Your final grade consists of the items described in Section V. Performance for each of the items above will be put into a calculator that outputs your final course percentage earned. As mentioned in Section VI, any extra credit earned will be added to this final score.

In order to reduce grade inflation and maintain equity across multiple course sections, all psychology courses are required to comply with departmental norms regarding grade distributions. According to departmental norms, **the mean grade in a 300-level class is 70 for a good class, 68 for an average class, and 66 for a weak class, with a standard deviation of 13.** Scaling may be used in order to comply with these norms; grades may be scaled up or down as necessary by the professor or department. Grades are not official until they appear on a student's academic record. You will receive both a percent and a letter grade for this course. At UBC, your course percentage is converted according to the key below:

A+	90-100%	B+	76-79%	C+	64-67%	D	50-54%
A	85-89%	B	72-75%	C	60-63%	F	0-49%
A-	80-84%	B-	68-71%	C-	55-59%		

Remember, you are earning a degree at a highly reputable post-secondary institution. Therefore, criteria for success are high. The Faculty of Arts offers the following guidelines that broadly characterize the kind of work that is generally associated with the main grade ranges. These characteristics help to put the Psychology Department Grading Policies into context. Please note that adequate performance is in the C range, which is the typical class average.

**A RANGE: *Exceptional Performance.*** Strong evidence of original thinking; good organization in written work; capacity to analyze (i.e., break ideas down) and to synthesize (i.e., bring different ideas together in a coherent way); superior grasp of subject matter with sound critical evaluations; evidence of extensive knowledge base.

**B RANGE: *Competent Performance.*** Evidence of grasp of subject matter; some evidence of critical capacity and analytic ability; reasonable understanding of relevant issues; evidence of familiarity with the literature.

**D-C RANGE: *Adequate Performance.*** Understanding of the subject matter; ability to develop solutions to simple problems in the material; acceptable but uninspired work; not seriously faulty but lacking style and vigor.

**F RANGE: *Inadequate Performance.*** Little or no evidence of understanding of the subject matter; weakness in critical and analytical skills; limited or irrelevant use of the literature.

## VIII. Course policies

### **Class participation**

Active learning is a critical component of a proper education and for that reason it will be frequently promoted during the term. You may be asked to answer questions at any point in class and you are expected to do your best. It is OK to not know the answer in this context but it is NOT acceptable to not try.

### **Attendance and Powerpoint slides**

Attendance is expected for every class period. In the event you miss a lecture, I strongly suggested that you acquire notes from a fellow classmate. The primary reason for this is that lecture slides are designed to give you a framework of our discussions, as opposed to giving you every piece of information discussed in class. For your convenience, lecture slides will usually be posted by 10PM the evening before a lecture. They will be posted in PDF format in two versions only (2 slides and 6 slides per page). ***Instructional materials are only for the purpose of learning in this course and must not be distributed or used for any other reason.***

### **Reading the assigned articles**

There are two primary goals for the research articles. The first is to expose you to primary literature in the field of cognitive neuroscience. The second is to give you an opportunity to improve your ability to process and evaluate this work, as it is fundamentally different and more challenging than a standard textbook. Exam questions will primarily target your conceptual understanding of the articles, including items such as the goal(s) of the paper, key elements of the methods, the results and what they mean, and any key points of the author's discussion. Lecture will help prepare you to navigate the readings successfully.

### **E-mail policy**

In most cases, e-mails will be answered within 48 hours of receipt (not including weekends). If you send the instructor or teaching assistant an email, the email subject should include the course and nature of the inquiry (i.e., "PSYC 365 – Question about the subtraction method"). Emails that you send should contain no more than one question and you should try to explain your current understanding of the concept in the email (which will be affirmed or corrected).

### **Class discussion board on Connect**

For your convenience, discussion threads will be created to improve information flow in our course. Logistical questions may be directed to the instructor on one thread. Inquiries, requests for class notes or study partners *directed to fellow students* may be posted on a second thread. Please note that you are NOT allowed to post class notes on the discussion board. Finally, current research in psychology will be posted on the third thread. Negative remarks on any of these discussion forums will not be tolerated and failure to respect this policy may result in your access to our course website being revoked.

### **Syllabus changes**

There may be minor changes to the syllabus during the term. You will be notified of these changes ASAP and no changes will be instituted that dramatically affect your ability to properly prepare for an examination (e.g., reading two extra articles the week of the midterm).

### **Research articles added to assigned reading**

In the event that a better article comes along that would enhance your experience in the course, it may be added in or substituted with an article that is currently on the course schedule. In the event that this occurs, ample notice will be given to allow you to adjust accordingly.

### **Office hours**

You should consider visiting Melanie's office hours if you would like to review one of your midterm examinations (note: only Melanie will have your exams for review), if you would like to discuss course content and/or study strategies, or you would like to discuss the field of psychology more broadly.

You should consider visiting Dr. Souza's office hours if you would like to discuss course content (or psychology more broadly) or if you have an issue with course performance or progress (e.g., would like to discuss your exam performance after meeting with Melanie or you missed an exam due to illness). Please note that any grading disputes (other than calculation errors) must be handled within two (2) weeks of the

scores being released. Furthermore, if a student requests a re-mark of a short-answer question, the instructor will re-review the marking of all of their short answer questions.

### **Classroom conduct**

Our classroom is a place where you should always feel safe and respected. It is also a place that is conducive to learning and intellectual curiosity. Any behaviors compromising this environment will not be tolerated and the student(s) and/or individual(s) will be asked to leave.

### **Taking an examination**

In my opinion, punctuality to lectures and exams is a sign of respect to your instructor, teaching assistants and fellow students. Tardy students should not ask the instructor or teaching assistant for what they missed from lecture because they can ask a fellow student. Furthermore, a student will not be allowed to write a midterm or the Final if (1) s/he is tardy 30 minutes or more, or (2) a student has already finished and submitted their exam, whichever occurs first. Students in this situation, or any other situation where they miss the exam for a reason of a non-medical nature, will not be allowed to write the exam and will receive a "o." Absolutely no exceptions will be made to these policies.

There will be no "in and out" privileges once you've started an exam (e.g., bathroom break) unless you have a documented medical reason for such a need. Medical documentation must be disclosed with Dr. Souza at least 24 hours prior to the exam.

When time is called at the end of the exam, you must immediately stop working and submit your exam materials. You will not be allowed more time for any reason, including (but not limited to): putting your name or ID on the exam or filling in or changing an answer. You must also remain completely silent until every exam has been collected. Failure to stop working when time is called or to stay silent until all exams have been collected will result in a 'o' on the exam. No exceptions will be made.

### **Missing a midterm or the Final**

The midterms cannot be written at another time. You will not be accommodated for missing a midterm unless you have a valid doctor's note (which will be verified). If you are a student from the Faculty of Arts, you must meet with an Arts Advisor within 48 hours of missing the exam (unless it is medically impossible). If you are from a different faculty, you should provide Dr. Souza with your medical note within the same time frame. Non-Arts students may scan and email their medical note to Dr. Souza. Being excused from an examination is at the sole discretion of Dr. Souza.

If you are excused from Midterm 1, that portion of the course grade will be evenly split between Midterm 2 and the Final. If you are excused from Midterm 2, that portion of the course grade will be added to the Final. If you are excused from both Midterm 1 and Midterm 2, you will be assigned a research paper (or project) to make up for the portion of the grade corresponding to Midterm 2. If you miss the final examination, you must connect with Arts Advising to address the issue. Make-ups for the Final may differ from the version used for the rest of the class.

### **Access and Diversity**

UBC is committed to equal opportunity in education for all students including those with documented physical or learning disabilities. If you believe you fall in this category, please visit this website (<http://www.students.ubc.ca/access/disability-services/support-students/exam-accommodations/>) to take the necessary steps to ensure that you have every opportunity that you deserve to excel here at UBC.

### Grade bumps

When computing final grades, the instructor carefully analyzes every single student to determine whether a grade bump is deserved. Bumps may be awarded for consistent performance at a major grade boundary or for marked improvement from the midterm to the final (10%+ at minimum). Bumps are not guaranteed and are *\*not\** awarded for non-academic reasons (i.e., student is graduating and/or involved in sports or other extracurricular activities). **DO NOT send the instructor an email asking for a grade bump.**

### Academic Misconduct

Cheating, plagiarism, and other forms of academic misconduct are very serious concerns of the University, and the Department of Psychology has taken steps to alleviate them. Relevant to this course, the Department has implemented software that, can reliably detect cheating on multiple-choice exams by analyzing the patterns of students' responses. This will be used for every assessment we take in this course.

**In all cases of suspected academic misconduct, the parties involved will be pursued to the fullest extent dictated by the guidelines of the University.** Strong evidence of cheating may result in a zero credit for the work in question. According to the University Act (section 61), the President of UBC has the right to impose harsher penalties including (but not limited to) a failing grade for the course, suspension from the University, cancellation of scholarships, or a notation added to a student's transcript.

Do note that during exams, the instructor and invigilators reserve the right to move students in their seating arrangement with no explanation provided.

## IX. Links that you may find useful...

### Helpful student information

UBC Academic Calendar

<http://www.calendar.ubc.ca/vancouver/academicyear.cfm>

UBC Access and Diversity

<http://students.ubc.ca/about/access>

Study skills, test anxiety tips

[http://www2.swccd.edu/~asc/wphomepage\\_3\\_contents.html](http://www2.swccd.edu/~asc/wphomepage_3_contents.html)

### UBC Psych student organizations

Psi Chi (local chapter of the Honors Society)

<http://psichi.psych.ubc.ca/>

Psychology Students' Association (PSA)

<http://psa.psych.ubc.ca/>

UBC Psychology's Undergraduate Journal

<http://ubcujp.psych.ubc.ca/>

UBC Psychology's *Psyched!* newsletter

<http://psanewsletter.wordpress.com/>

## ASSIGNED READINGS

- Anguera, J.A., Boccanfuso, J., Rintoul, J.L., Al-Hashimi, O., Faraji, F., *et al.* (2013). Video game training enhances cognitive control in older adults. *Nature*, 501, 97-103
- Beer, J.S., John, O.P., Scabini, D. & Knight, R.T. (2006). Orbitofrontal cortex and social behavior: integrating self-monitoring and emotion-cognition interactions. *J Cog Neuro*, 18(6), 871-9.
- Catani, M. & Mesulam, M. (2008). What is a disconnection syndrome? *Cortex*, 44, 911-3.
- Ellamil, M., Dobson, C., Beeman, M. & Christoff, K. (2012). Evaluative and generative modes of thought during the creative process. *Neuroimage*, 59(2), 1783-94.
- Gazzaley, A., Cooney, J.W., Rissman, J. & D'Esposito, M. (2005). Top-down suppression deficit underlies working memory impairment in normal aging. *Nat Neurosci*, 8(10), 1298-1300.
- Kanwisher, N., McDermott, J. & Chun, M.M. (1997). The fusiform face area: a module in human extrastriate cortex specialized for face perception. *J Neurosci*, 17(11), 4302-11.
- Koenigs, M., Young, L., Adolphs, R., Tranel, D., Cushman, F., *et al.* (2007). Damage to the prefrontal cortex increases utilitarian moral judgments. *Nature*, 446, 908-11.
- McCabe, D.P. & Castel, A.D. (2008). Seeing is believing: the effect of brain images on judgments of scientific reasoning. *Cognition*, 107, 343-52.
- Paulesu, E., Demonet, J.-F., Fazio, F., McCrory, E., Chanoine, V., Brunswick, N. *et al.* (2001). Dyslexia: cultural diversity and biological unity. *Science*, 291, 2165-7.
- Poldrack, R.A. (2008). The role of fMRI in cognitive neuroscience: where do we stand? *Curr Opin Neurobiol*, 18, 223-7.
- Tunik, E., Frey, S.H. & Grafton, S.T. (2005). Virtual lesions of the anterior intraparietal area disrupt goal-dependent on-line adjustments of grasp. *Nat Neurosci*, 8(4), 505-11.
- Van Der Veen, F.M., Aben, H.P., Smits, M. & Roder, C.H. (2014). Grapheme-color synesthesia interferes with color perception in a standard Stroop task. *Neuroscience*, 258, 246-53.

## Psychology 365: Lecture and reading schedule

Meeting	Date	Day	Topic	Assigned readings
1	05-Jan	M	Course introduction	-
2	07-Jan	W	History of cognitive neuroscience	-
3	09-Jan	F		-
4	12-Jan	M		-
5	14-Jan	W	The basics of cellular neuroanatomy	-
6	16-Jan	F	Fundamentals of gross neuroanatomy and neurodevelopment	Catani (2008)
7	19-Jan	M		
8	21-Jan	W	**optional: <a href="http://www.med.harvard.edu/aanlib/cases/caseNA/pb9.htm">http://www.med.harvard.edu/aanlib/cases/caseNA/pb9.htm</a>	
9	23-Jan	F		
10	26-Jan	M	Methods in cognitive neuroscience	Poldrack (2008); McCabe (2008)
11	28-Jan	W		
<b>12</b>	<b>30-Jan</b>	<b>F</b>	<b>Midterm Examination 1</b>	<b>Meetings 1-11, associated readings</b>
13	02-Feb	M	Sensation and perception	Van Der Veen (2014)
14	04-Feb	W		
15	06-Feb	F	Object recognition	Kanwisher (1997)
16	09-Feb	M	<b>NO CLASS - Family Day (BC)</b>	-
17	11-Feb	W	Control of action	Tunik (2005)
18	13-Feb	F		
19-21	16-20 Feb	MWF	<b>NO CLASS - Spring Recess</b>	-
22	23-Feb	M		
23	25-Feb	W	Attention and consciousness	Ellamil (2012)
24	27-Feb	F		
25	02-Mar	M	Learning and memory	Gazzaley (2005)
26	04-Mar	W		
27	06-Mar	F	Language (with N. Bedo)	Paulesu (2001)
28	09-Mar	M		
<b>29</b>	<b>11-Mar</b>	<b>W</b>	<b>Midterm Examination 2</b>	<b>Meetings 13-28, associated readings</b>
30	13-Mar	F	Hemispheric specializations	TBA after MT2
31	16-Mar	M		
32	18-Mar	W	Emotion	Beer (2006); Koenigs (2005)
33	20-Mar	F		
34	23-Mar	M	Cognitive control	Anguera (2013)
35	25-Mar	W		
36	27-Mar	F	Special topics: Dev. Cog Neuro	TBA after MT2
37	30-Mar	M	Special topics: Soc. Cog Neuro	TBA after MT2
38	01-Apr	W	Special topics: Clin. Cog Neuro (1)	TBA after MT2
39-40	3-6 Apr	F/M	<b>NO CLASS - Good Friday, Easter Monday</b>	-
41	08-Apr	W	Special topics: Clin. Cog Neuro (2)	-
42	10-Apr	F	Course synthesis and conclusion	-
-	TBA	-	<i>*Optional* Q&amp;A review session</i>	-
-	<b>TBA</b>	-	<b>Cumulative Final Examination</b>	<b>Meetings 1-41</b> <b><u>Only the readings AFTER Midterm 2</u></b>