

YORK UNIVERSITY, FACULTY OF HEALTH
DEPARTMENT OF PSYCHOLOGY
PSYCH 4080 Y 6.0 B: NEUROPSYCHOLOGY OF ABNORMAL BEHAVIOUR
Thursday/8:30-11:30/Online via Zoom
FALL & WINTER 2021-2022

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Pre-requisites: PSYC 1010 or PSYC 2410, with a minimum grade of C
PSYC 2030 or PSYC 2530; one of PSYC 2021, PSYC 2020, PSYC 2510;
PSYC 2240 and PSYC 3140. Students without these prerequisites may enroll
with the written permission of the instructor. Course credit exclusion: None.

Course website: eClass, which can be accessed using your Passport York username and
password. All course materials and links will be available on this site.

Course materials: Materials for this course will be drawn from various sources including library
links to readings and internet links to videos and podcasts. Course materials are
designed for use as part of this course at York University and are the property
of the instructor unless otherwise stated. All materials have either been
licensed for use in this course or fall under an exception or limitation in
Canadian Copyright law.

Course Description: The focus of this seminar course is examine how brain structure and function is
central to understanding cognition, emotion, and behaviour. The course will
challenge students to consider *why* specific behaviors or syndromes are
observed in neurological and psychiatric disorders and what factors contribute
to optimal or suboptimal outcomes. Discussion of current research and real life
situations through case study will be the focus of the synchronous component
of the class.

Students can expect to learn:

- i) how disruptions to neurodevelopment, neuroanatomy, and neurophysiology relate to specific patterns of cognitive, emotional, and other behavioural outcomes;
- ii) approaches to the evaluation and treatment of various neuropsychological disorders;
- iii) current issues and trends in the broader field of clinical neuropsychology.

Program Learning Outcomes:

Upon completion of this course, students should be able to:

1. Demonstrate in-depth knowledge in the neuropsychology of abnormal behaviour.
2. Critically evaluate, synthesize and make connections between neuropsychological topics.

3. Locate research articles and show critical thinking about research findings in neuropsychology of abnormal behaviour.
4. Express knowledge of neuropsychology of abnormal behaviour in written form.
5. Engage in evidence-based dialogue with course director and peers.
6. Demonstrate an ability to work with others, including those with diverse backgrounds and perspectives.

Commitment to Intersectionality

The course instructor acknowledges that every individual represents multiple sociocultural identities, driven by systems of privilege and oppression, that intersect to uniquely shape one's world view. The instructor is committed to creating a safe, respectful, and inclusive learning environment that seeks to minimize systemic forces of oppression, including but not limited to classism, racism, ableism, and transphobia. All individuals in this course are invited to join in this commitment to help foster mutual respect within a diversity-oriented learning community.

Readings / Text:

All assigned readings will be available online through the York University library or as documents posted in eClass. Assigned readings will be supplemented with videos, internet resources, podcasts and/or discussions as deemed relevant by the instructor. It is recommended that you download an electronic version of the following textbook as there will be several chapters assigned from this book and it can be additionally used as supplementary resource.

M. R. Schoenberg & J. G. Scott. (2011). *The Little Black Book of Neuropsychology: A Syndrome-Based Approach*, Springer.

Recommended:

- Zinsser W. (2006). *On Writing Well: The Classic Guide to Writing Nonfiction*. (7th edition). New York, NY: Harper Collins Publishers. <http://richardcolby.net/writ2000/wp-content/uploads/2017/09/On-Writing-Well-30th-Anniversa-Zinsser-William.pdf>

The course will be organized into the following modules:

Module	Weeks	Topic
1	2-5	Neuroanatomy for neuropsychologists and general methodologies related to neuropsychological assessment.
2	6-12	Part I: Neuropsychological evaluation of major functional domains (e.g. attention/executive, learning memory, language/speech, etc.). Readings will focus on theoretical issues related to neuropsychological assessment.
3	13-19	Part II: Neuropsychology of neurological and clinical disorders. Topics will focus on one or two current issues related to diagnostic considerations, understanding risk factors, symptomatology, and brain structure-function relationships.
4	20-24	Development of grant proposals related to a neuropsychological concept or issue.

Basis of Evaluation

Overall, ~50% of your final mark will reflect mastery of content and the other 50% will reflect development of ideas.

Assessment	Date of Evaluation	Weighting
Attendance & participation	September 15th – April 6th	10%
Neuroanatomy and methodology quiz	Oct 7, 2021	15%
Critical reflections	Sept 16/21 to Feb 10/22	20%
Discussant role	Oct 21/21 to Mar 3/22	25%
Oral grant proposal	March 10-31, 2021	10%
Written grant proposal	March 31, 2021	20%

Description of Evaluative Components

Attendance and participation (10%). A participation grade will be based on weekly attendance and general quality of contributions to class discussions (5% per term) during course hours. To achieve an excellent grade, students must make insightful comments reflecting course material, and participate regularly in class discussions. Weekly attendance is mandatory. Absences will only be excused in the case of extenuating circumstances with appropriate documentation. **Purpose:** To become co-creators of new knowledge through active participation in evidence-based dialogue with peers and the instructor.

Neuroanatomy and methodology quiz (15%). Students will be quizzed on neuroanatomy and methods in neuropsychology based on course content covered in weeks 2-4, including information covered in select neuroanatomy online teaching modules. The quiz will occur during scheduled class time and will be closed-book. The format will be short answer and multiple choice questions. **Purpose:** To demonstrate foundational knowledge in (1) structural neuroanatomy and (2) the methods used to assess neuroanatomical functions.

Critical reflections (10 in total x 2% each). Prior to class, students are expected to (1) read, watch or listen to assigned material, and (2) submit brief responses using eClass to a set of questions related to the assigned material. There will be 15 critical reflections assigned through the year; students must complete 10 of 15 critical reflections to fulfill requirements for this component. Students may complete any of the 15 critical reflections of their choosing. Responses to all questions must be submitted on eClass at least 24 hours before class (i.e. by 8:30 AM Wednesday). The questions will be designed to: (1) direct student reading/attention to key information; (2) prepare students to have a meaningful discussion in break-out groups; (3) encourage critical reflection on a topic; and (4) help the instructor identify material that needs extra attention during synchronous class time. A mark of 0 (fail/unacceptable), 1 (borderline), or 2 (pass) will be made. Late submissions will be given a 0. **Purpose:** To develop critical thinking skills as it applies to evaluating scientific literature and to stimulate class discussions.

Discussant role (15% seminar leader & 10% lay summary). Part 1. In break-out groups (~15 students per group), there will be one discussant who will expand on the week's topic by linking the assigned material to a contemporary empirical study that the discussant finds. The instructor will make recommendations for the week's topic (see Seminar Topic Ideas). Students may choose a focus that is

not included on the list, but this must be pre-approved by the course instructor. Students **MUST confirm their question/topic with the instructor no later than one week in advance** of their scheduled presentation. Please send a PDF of your article to the instructor one week before your presentation. **Purpose:** (1) to think critically about a selected topic; and (2) to learn to communicate ideas clearly and succinctly in oral and written format. **Tips:** Find your paper early. Read the paper closely and carefully. Reformulate it into your own words and draw connections with your own knowledge base when possible. Only select a paper that you can explain! Avoid highly technical papers. Make sure to explain any unfamiliar terms.

In the first 15 minutes of the break-out room, the discussant:

- Will discuss 3-5 specific take-away points, such as “what is the primary research question”, “why is this topic important?”, “how has this topic been approached?” or “how does the information advance our understanding of the topic?”
- The discussant may challenge an argument made in the assigned reading or compare/contrast the article to the topic discussed in class (e.g. are findings consistent with past studies? Are there alternative explanations that should be considered? How does the paper complement or contradict knowledge acquired in this course?)
- Share their specific take-away points in a simple form; for example, via a visual representation of information (e.g. infographic or poster, concept map, key message slides, summary table) – any visual that helps the other members of the group process the new information is acceptable! The “visual” that is used by each discussant will be posted at the end of the class for the other group to see.

In the last 5 minutes of the break-out room, the members of the group will:

- discuss the take-away points presented by the discussant;
- provide feedback to the discussant regarding the communication of the take-away points.

At the end of the break-out room, a reporter from the group will return to the main class to summarize what was learned and the relevance of the findings based on the break-out room discussion. The reporter will be the students who will serve as the discussant the following week. The discussant will have an opportunity to elaborate on the discussion and share what they found most interesting about their topic with the entire class. A rubric for this assignment is posted on eClass.

Part 2 (10%). One week after discussing the topic in the break-out group, the discussant will submit a reflection on their topic (max 1000 words). The reflection should focus on discussing the following themes: **What was learned? So What?** (i.e. relevance of findings? Other questions that the study raises?). **Now What?** (i.e. implications for future research). Students are encouraged to reflect on the discussion that they had in Part 1 with their peers.

Grant proposal (20% written component). Working with a partner, students will write a research proposal to explore the brain and behaviour relationship for one of the neurocognitive disorders discussed in class. **Purpose:** to help students learn how to conceptualize a research question and propose a methodology to study it. As well, this assignment is to provide students with the opportunity to work as a team. The research proposal will follow the format of a typical funding application, including a background section to support the research question, a clear hypothesis, a methods section, and anticipated outcomes. Topics must be approved in advance by the instructor.

Oral presentation (10%). Each partner pair will give a short, in-class oral presentation (10-12 min) on the grant proposal idea followed by 10 minutes for class feedback and discussion. Students will be marked on the content of the presentation as well as the clarity of oral presentation and organization of slides. Students are expected to use the feedback they receive to refine their proposal. Students who are observing presentations are expected to actively participate in providing peer feedback.

Purpose: To demonstrate ability to effectively communicate neuropsychological concepts to a general lay audience in written/visual and oral formats.

Important York Policies

Grading as per Senate Policy

The course grading scheme conforms to the 9-point grading system used in undergraduate programs at York (e.g., A+ =9, A =8, B+ =7, C+ =5, etc.). Assignments and tests will bear either a letter grade designation or a corresponding number grade (e.g. A+ =90 to 100, A =80 to 89, B+ =75 to 79, etc.)

For any missed quiz/presentation or late assignment, students MUST do the following:

1. Promptly notify the course instructor if you plan on being absent on a day that you are presenting to the class or on a quiz day. Arrange for an alternative date to complete the work. The date will be mutually agreed upon by the course instructor and student. Please discuss your planned absence 48 hours before the class or earlier! Students are strongly encouraged to contact the instructor in advance if they foresee any barriers to or have concerns about completing the required course components.
2. Failure to notify the instructor of your absence 48 hours before the class will require appropriate supporting written documentation with any request to write a make-up quiz or present on an alternate date. Please use the Faculty of Health Missed Tests/Exams Form: <https://www.yorku.ca/health/wp-content/uploads/sites/30/2020/08/MissedTestDocumentationForm.pdf>

Examples of legitimate reasons for missing a quiz or assignment deadline may include physical or mental illness that emerged suddenly or unexpectedly and is severe and enough to prevent a student from attending the Zoom lecture online, or a family emergency that prevents attendance. This does not cover all possible legitimate scenarios; reasons for missed quizzes or deadlines will be evaluated on a case-by-case basis. In the absence of a legitimate documented reason for missing a quiz or presentation, student requests for an alternate date may be denied and a grade of zero will be given for the missed class.

Missed Lecture

If a student misses attendance at a scheduled lecture, they are not required to submit any forms or provide a reason for their absence. However, lack of attendance (or regular participation in class) will be reflected by a low participation grade. If a student has a legitimate reason for which they must miss more than one class, they are encourage to speak with the instructor (before the missed class).

Last day to add course with permission of instructor (October 26). **Last day to drop course** without receiving a grade (Feb 11).

Access/Disability

While all individuals are expected to satisfy the requirements of their program of study and to aspire to achieve excellence, the university recognizes that persons with disabilities may require reasonable

accommodation to enable them to perform at their best. The university encourages students with disabilities to register with Student Accessibility Services to discuss their accommodation needs as early as possible in the term to establish the recommended academic accommodations that will be communicated to Course Directors through their Letter of Accommodation (LOA).

Please let me know as early as possible in the term if you anticipate requiring academic accommodation so that we can discuss how to consider your accommodation needs within the context of this course. Sufficient notice is needed so that reasonable steps for accommodation can be discussed. Accommodations for tests normally require three (3) weeks (21 days) before the scheduled test/exam to arrange. Failure to make these arrangements may jeopardize your opportunity to receive academic accommodations. Additional information is available at www.yorku.ca/disabilityservices

Cheating/Plagiarism

The University does not look favorably on cheating of any kind and the penalties for doing so are very harsh. Become familiar with the rules and regulations regarding cheating / plagiarism. If you have any questions about academic honesty/integrity, please go to the Academic Integrity web site at York University (<http://www.yorku.ca/academicintegrity>) to read the section 'For Students'.

Comments on the Use of Phones, Social Media, and Doing Other Work During Class:

Engaging in texting, email, Facebook, Twitter, and all other social media are strongly discouraged during class. They are highly distracting. Use of social media when someone is speaking is also disrespectful to the speaker. In addition, research on "multi-tasking" shows that that it greatly reduces performance for both people using their devices, and for those beside them.

Course Materials Copyright Information

These course materials are designed for use as part of the PSYC 4080 course at York University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as book chapters, journal articles, music, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law. Copying this material for distribution (e.g. uploading material to a commercial third-party website) may lead to a violation of Copyright law. [Intellectual Property Rights Statement](#).

COURSE SCHEDULE (subject to change by the course instructor)

Week/Date TOPIC		READINGS
1 – Sept 9	Course overview. Introductions; Discuss syllabus & course assignments	None. Please take some time to review discussant topics for next week!
2 – Sept 16	Methods for Assessing Brain Structure and Function Anatomical features of the CNS Discussant topics assigned **Critical reflection #1 due	Bigler, E. (2015). Structural Image Analysis of the Brain in Neuropsychology Using Magnetic Resonance Imaging Techniques. <i>Neuropsychology Review</i> , 25, 224-249. <i>Asynchronous component: “Introduction to neuroanatomy >> introduction to CNS”</i> http://neuroanatomy.ca/modules/CNSintro/story.html
3 – Sept 23	Neuropsychological theory and practice	Ch.3. Neuropsychological Assessment and Diagnosis. From Zillmer EA, Spiers MV, Culbertson W. 2008. <u>Principles of neuropsychology</u> , 2nd edition. Thomson Learning, Inc. <i>Asynchronous component: “Interactive modules” >> “overview of cortex”</i> http://neuroanatomy.ca/modules/
4 – Sept 30	Brain structures/systems and cerebral asymmetry **Critical reflection #2 due	Ch. 3. Neuroanatomy Primer: Structure and Function of the Human Nervous System. *Focus on: Table 3.6, Cortical functional neuroanatomy (p. 112-126) PODCAST (51 minute listen): https://www.npr.org/2019/02/01/690656459/one-head-two-brains-how-the-brains-hemispheres-shape-the-world-we-see
5 – Oct 7	Neuropsychological theory and practice – cont’d.	Quiz (15%) Neuropsychological measures demo
	READING WEEK	
MODULE 2	Seminar Topics / Discussants	READINGS
6 – Oct 21	Attention/Concentration 1. Arslan Aoussi 2. Aagam **Critical reflection #3 due	Koziol LF, Joyce AW, Wurglitz G. (2014). The Neuropsychology of Attention: Revisiting the “Mirsky Model”, <i>Applied Neuropsychology: Child</i> , 3:4, 297-307. Supplemental: Ch. 6. Attention/Concentration: The Distractible Patient.
7 – Oct 28	Language/Speech 1. Kamyra 2. Genesis **Critical reflection #4 due	Ch. 7. Language Problems and Assessment: The Aphasic Patient. Little Black Book. http://neuroanatomy.ca/modules/Language/story_html5.html
8 – Nov 4	Memory & Learning 1. Ravinder 2. Sandra **Critical reflection #5 due	Ch. 8. Memory and Learning: The Forgetful Patient. Little Black Book. Lupien et al. (2018). The effects of chronic stress on the human brain: From neurotoxicity, to vulnerability, to opportunity. <i>Frontiers in Neuroendocrinology</i> , 49:91-105.

9 – Nov 11	Visuospatial / Visuo-constructional Abilities 1. Aysha 2. Lauren **Critical reflection #6 due	Ch. 9. Deficits in Visuospatial/Visuoconstructional Skills and Motor Praxis. Little Black Book.
10 – Nov 18	Executive Functioning 1. Arhum 2. Anoushka 3. Ionela **Critical reflection #7 due	Ch. 10. Frontal lobe/Executive Function. Review (1) neuroanatomy of frontal lobes (p.219-227); (2) symptoms of FL dysfunction (p. 227-232). Focus on the 3 frontal lobe syndromes (p. 232-239) Zelazo PD (2020). Executive function and Psychopathology: A Neurodevelopmental Perspective. Ann Rev Clin Psychol: 16:431-454.
11 – Nov 25	Affect, Emotional Regulation, and Mood 1. Michael 2. Mansi **Critical reflection #8 due	Ch. 11. Affect, Emotions and Mood. Little Black Book. Blakemore S-J & Robbins TW. (2012). Decision-making in the adolescent brain. Nature Neuroscience, 15(9): 1184-1191.
MODULE 3		
12 – Dec 2	Neuroplasticity in childhood 1. Samantha 2. Ireland **Critical reflection #9 due	Dennis et al (2013). Age, plasticity, and homeostasis in childhood brain disorders. Neuroscience and Biobehavioral Reviews, 37: 2760-73.
13 – Jan 13	Psychotic disorders 1. Meghan B 2. Ceren 3. Aarani **Critical reflection #10 due	Woodward ND (2016). The course of neuropsychological impairment and brain structure abnormalities in psychotic disorders. Neuroscience Research. 102:39-46. Palmer BW, Dawes SE, Heaton RK. (2009). What Do We Know About Neuropsychological Aspects of Schizophrenia? Neuropsychol Rev, 19:365-384.
14 – Jan 20	Demyelinating Disorders (Multiple Sclerosis) 1. Sonika 2. Soroush **Critical reflection #11 due	Ch. 20. Multiple Sclerosis and Other Demyelinating Disorders. Little Black Book.
15 – Jan 27	Epilepsy & Seizure disorders 1. Nicole 2. Sylvia **Critical reflection #12 due	Westerveld M. Ch. 10. Neuropsychology in pediatric epilepsy. (pp. 149-157). From Morgan, J. E. & Ricker, J. H. (2008). <u>Textbook of Clinical Neuropsychology</u> . New York: Psychology Press, Taylor & Francis Group.
16 – Feb 3	Traumatic Brain Injury 1. Megan C. 2. Dimitris **Critical reflection #13 due	Ch. 22. Mild traumatic brain injury. Little Black Book. Keightley ML et al. (2014). Is there evidence for neurodegenerative change following traumatic brain injury in children and youth? A scoping review. Frontiers in Human Neuroscience, 8(139).

17 – Feb 10	Dementia 1. Thibisha 2. Moe **Critical reflection #14 due	Ch. 17. Dementia. A family tragedy (pp.304-327). In <u>Fractured Minds: A Case Study Approach to Clinical Neuropsychology</u> . (2 nd ed). Oxford University Press.
18 – Feb 17	Mood related 1. Serena 2. Victoria	<i>Intro to grant writing (Dr. Till)</i> Discussion of sample grants
Feb 24	<i>READING WEEK: NO CLASS</i>	
19 - Mar 3	Interventions in Neuropsychology 1. Sara 2. Lynn **Critical reflection #15 due	Jones et al. (2021). Preserving Prospective Memory in Daily Life: A Systematic Review and Meta-Analysis of Mnemonic Strategy, Cognitive Training, External Memory Aid, and Combination Interventions. <i>Neuropsychology</i> , 35(1): 123-140. Supplemental: Keshavan et al. (2014). Cognitive training in mental disorders: Update and future directions. <i>Am J Psychiatry</i> : A1-13.
20 - Mar 10	Grant Presentations 1. 2. 3.	
21 - Mar 17	Grant Presentations 1. 2. 3. 4.	
22 - Mar 24	Grant Presentations 1. 2. 3. 4.	
23 - Mar 31	Grant Presentations 1. 2. 3. 4.	<u>DUE: Written grant proposal project</u>
24 - Apr 7	Course wrap up; Neuropsychology of everyday functioning	Kraal et al. (2021). Function reserve: The residual variance in instrumental activities of daily living not explained by brain structure, cognition and demographics. <i>Neuropsychology</i> , 35(1): 19-32.

Discussant Topics

Week/date	Topic	Suggested Hot Topics
6 – Oct 21	Attention/Concentration	<ul style="list-style-type: none"> • how a specific brain region (e.g. cingulate, thalamus, corpus callosum, prefrontal cortex.) is implicated in attention, impulsivity or vigilance • role of stimulants on attention • sustained attention network in TBI • lead exposure as a risk factor of ADHD
7 – Oct 28	Language/Speech	<ul style="list-style-type: none"> • how laterality of brain insult can selectively impact language function • how word recognition is represented in the auditory ventral stream • interventions for aphasia

		<ul style="list-style-type: none"> neuroanatomical correlates underlying lexical knowledge of a category (e.g. tools)
8 – Nov 4	Memory & Learning	<ul style="list-style-type: none"> how an anatomical structure (or laterality of brain insult) can show specificity associated with verbal or visual memory outcomes. how stress can impact memory functioning impact of chronic depression on learning and memory emotional memory and aging
9 – Nov 11	Visuospatial / Visuo- constructional Abilities	<ul style="list-style-type: none"> impact of impairment to the ventral or dorsal pathway interventions for agnosias or apraxias following stroke Dissociation between word and face recognition
10 – Nov 18	Executive Functioning	<ul style="list-style-type: none"> how adverse childhood experiences (e.g. exposure to stress, lead exposure, trauma) can impact executive function skills. Dysexecutive syndrome associated with frontal brain injury or Parkinson's disease
11 – Nov 25	Affect and Emotional Regulation	<ul style="list-style-type: none"> role of limbic structures in emotional regulation social cognition in autism spectrum disorder social attention in schizophrenia attentional bias in anxiety disorders epigenetic influences and development of emotional regulation
12 – Dec 2	Neuroplasticity in childhood	<ul style="list-style-type: none"> how the developing brain recovers (or not) following an acute brain injury, such as TBI, stroke, or brain tumour how age at stroke impacts cognitive function in children
13 – Jan 13	Psychotic disorders	<ul style="list-style-type: none"> Frontal-executive deficits in schizophrenia Long-term course of cognitive functioning in schizophrenia Childhood trauma and risk of schizophrenia Facial emotion recognition in schizophrenia Link between substance-induced psychosis and schizophrenia
14 – Jan 20	Demyelinating Disorders (Multiple Sclerosis)	<ul style="list-style-type: none"> how cognition in patients with MS can change as a function of structural damage (e.g. neural compensation hypothesis) intervention that can improve cognitive function in MS role of cognitive reserve in MS association between processing speed and executive functioning in MS
15 – Jan 27	Epilepsy & Seizure disorders	<ul style="list-style-type: none"> Memory impairment associated with seizure disorder Neuroplasticity of language system in young patients with epilepsy Link between verbal memory impairment and socioemotional symptoms Role of neuropsychology in epilepsy surgery
16 – Feb 3	Traumatic Brain Injury	<ul style="list-style-type: none"> Post-concussion syndrome – why are the effects of mild TBI sometimes viewed as being paradoxical? Sex differences in TBI recovery Link between cognitive decline/dementia in moderate/severe TBI Neurodegenerative changes following TBI Chronic traumatic encephalopathy (CTE) in athletes
17 – Feb 10	Dementia	<ul style="list-style-type: none"> Link between depression and dementia Risk factors that predict onset and/or trajectory of Alzheimer's disease Self-awareness in Alzheimer's disease Emotion recognition in individuals with dementia

18 – Feb 17	OPEN for class vote!	<ul style="list-style-type: none">• Cognitive sequelae associated with Long COVID; Neurotoxic exposures and brain function; Substance use disorders; Anxiety and depression; neurodevelopmental disorders (FASD, genetic disorders, etc.) OTHER?
19 - Mar 3	Interventions in Neuropsychology	<ul style="list-style-type: none">• Effects of computerized cognitive training in healthy elderly – does it work?• Effects of physical exercise on brain and/or cognition• Virtual reality interventions to improve cognition• Moderators of response to cognitive training• Brain neuromodulation approaches (e.g. TMS)