

YORK UNIVERSITY, FACULTY OF HEALTH
DEPARTMENT OF PSYCHOLOGY

FALL/WINTER 2019-2020 COURSE OUTLINE

Course: PSYCH 4080 6.0C (Y), Neuropsychology of Abnormal Behaviour

Time and Location: 8:30 -11:30 AM, Thursday, CLH-110

Course Instructor: Christine Till, PhD, C.Psych *Office:* 125 BSB
Phone: 416.736.2100 ext. 20776 *Office Hours:* by appointment
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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: **Moodle@York**, which can be accessed at: <http://moodle.yorku.ca/> using your
Passport York username and password. Course announcements, lecture slides,
and handouts will be posted on Moodle.

*Course materials are designed for use as part of this course at York University and are the property of the instructor unless otherwise stated. Third party copyrighted materials (such as book chapters, journal articles, videos, etc.) have either been licensed for use in this course or fall under an exception or limitation in Canadian Copyright law.

Course Description:

Neuropsychology is the bridge between psychology and neuroscience. The focus of this seminar course is to examine how brain function is affected by a variety of neurological and psychiatric disorders that occur across the lifespan. The course will challenge students to consider *why* specific behaviors or syndromes are observed and what factors contribute to optimal or suboptimal outcomes. A key focus of the course will be on discussing how we have come to understand various clinical disorders and what factors are considered in neuropsychological evaluation. The course will emphasize how widely held assumptions in the field of neuropsychology have evolved.

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 resolve conflicting results in neuropsychology of abnormal behaviour.
3. Articulate trends in neuropsychology of abnormal behaviour.
4. Locate research articles and show critical thinking about research findings in neuropsychology of abnormal behaviour.
5. Express knowledge of neuropsychology of abnormal behaviour in written form.
6. Engage in evidence-based dialogue with course director and peers.
7. Demonstrate an ability to work with others.

Specific Learning Objectives:

1. To understand the impact of clinical disorders on neuropsychological function
2. To give an oral presentation related to the field of neuropsychology
3. To conceptualize a research question and methodology related to neuropsychology

Organization of the Course:

The course will involve didactic lecture, in-class demonstrations and videos, discussion of case presentations and readings, and student oral presentations. Lectures are designed to enrich, clarify, and illustrate current issues in clinical neuropsychology. Oral presentations will provide students with the opportunity to prepare a teaching-style presentation – an important skill for graduate or professional training. My goal is to engage students in the field by interweaving biopsychological theory with real-life clinical examples and multi-disciplinary scientific methods. Prior to arriving for class, you are expected to complete assigned readings. To achieve an excellent grade, students must make regular, insightful comments reflecting the readings in class, and participate in class discussions.

The course will be divided into three parts:

Part 1: Introduction to neuroanatomy, neural organization and neurodevelopment, general methodology, and theoretical issues of neuropsychological assessment with a short test assessing mastery of content in these areas.

Part 2: Seminars on how major clinical disorders affect behavioural function. Each seminar will begin with an overview and/or clinical case study examining the features of a disorder (i.e. diagnostic considerations in assessment, prevalence, etiology, symptomatology, neuropathology), and the neuropsychological profile related to each disorder. Seminars are designed to promote discussion of specific and relevant topics and to challenge students to apply knowledge acquired in class to real-life clinical and research situations. Students will be encouraged to participate in class discussions about theoretical and experimental issues raised in student presentations and readings.

Part 3. Working in groups, students will conceptualize a research study and propose a methodology for answering a novel research question¹. Each member of the group will give a short presentation in class related to the grant proposal.

Basis of Evaluation (specific assignment instructions and guidelines to follow):

1. Mastery of content (70%)

15% In-class quiz (October 3, 2019). This quiz will assess your knowledge of functional neuroanatomy, neurodevelopment, general principles of clinical neuropsychology.

35% Take home Test 1 (due Dec 5, 2019; 20%) and Test 2 (due Feb 27, 2019; 15%). This test will assess your knowledge of neuropsychology theory as it relates to neurological disorders and syndromes that have been discussed in class. On each test, you will be provided with 5-6 questions and will be asked to answer a subset of the questions (maximum 2 pages, double-spaced for each answer).

20% Discussant role. You will select a specific topic and then focus on reviewing the evidence for or against your topic. For example, 'cannabis use increases risk of schizophrenia' or 'psychostimulants enhance cognitive function in people with ADHD'. Your goal is to explain the rationale for the question (why is this important?) and then

¹Recommended text for grant proposal: Harrington, M. 2006. The design of experiments in neuroscience, 1st Ed., Thomson Learning, Inc.

provide evidence supporting or refuting your topic. You must discuss at least one paper to form the basis of your presentation. You may choose a paper that is recommended by the instructor or one that you select. The paper can be a review article on the topic or an empirical study. You are encouraged to speak with (or email) the course instructor if you are having trouble selecting a topic. Remember – you should only select a paper that you can explain! Try to avoid highly technical papers.

You must select your paper at least one week before your presentation and inform the instructor. I will upload a link to your paper and slides onto moodle. Presentations will be roughly 15 min plus 10 min for discussion and questions. Typically, a power-point presentation is prepared. Please provide a hard copy of your slides to the instructor.

Some examples of topics include (see website for some suggested papers)

- A cognitive ability that is affected by a disorder (trajectory over time, etc.)
- A neuropsychological measure that is sensitive to detecting impairment for a disorder
- Risk or protective factors associated with a disorder
- Challenges to conceptualization of a disorder (e.g. how pain or other associated problems, such as affective distress, sleep disturbance, or medication use can interfere with cognitive performance and confound interpretation of neuropsychological results)
- Neural correlates associated with a disorder or brain changes following an intervention
- Gene x environment interactions

2. Development of ideas (30%)

20% Grant proposal (15% written, 5% oral presentation). Working with a partner, you will write a research proposal to explore the brain and behaviour relationship for one of the disorders that we have discussed in class. The purpose of this assignment is to help you learn how to conceptualize a research question and propose a methodology to study it. As well, the exercise is to provide you with the opportunity to work as a team. You will be provided with a template in early January for what to include in the grant and how to structure it. Each group will give a short, in-class oral presentation (20-25 min.) on the grant followed by 10-15 minutes for class feedback and discussion.

10% Participation. A participation grade will be based on weekly attendance and general quality of contributions to class discussions (5% per term)

Important York Policies

Grading as per Senate Policy

The grading scheme for the course 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.)

Policy for Late Work / Missed Tests or Exams

Students with a documented and valid reason for missing a course test, such as illness, compassionate grounds, etc., which is confirmed by supporting documentation, i.e., Attending Physician's Statement Form available at: http://www.registrar.yorku.ca/pdf/petitions/attending_physician_statement.pdf may request to write a make-up test. Failure to provide appropriate documentation will result in a grade of 0% for the missed test.

Non-medical circumstances must be supported by appropriate documentation, i.e., death certificates, obituary notice, automobile accident reports, airline/bus ticket/receipt for emergency travel (must indicate date of booking, destination, departure and return dates). A conflict in another course during the time of the make-up is not an acceptable reason for missing the make-up (unless there is an examination in the other course at that time).

Access/Disability

York provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods. Students with physical, learning or psychiatric disabilities who require accommodation in teaching style or evaluation methods should **discuss this with the course director early in the year** so that appropriate arrangements can be made. 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 Cellphones, Social Media, and Doing Other Work During Class:

Texting, email, Facebook, twitter, and all other social media are not allowed during class (except during a break). They are highly distracting to you and to others. 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. If you need to use social media during class, then please excuse yourself and do so outside of class. Finally, students are not allowed to use their laptops to take care of other tasks that are not class related. This is for the same reason as using social media.

GENERAL GUIDES TO WRITING AND PRESENTATIONS

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>

Kosslyn, S.M. (2007). *Clear and to the Point: 8 Psychological Principles for Compelling PowerPoint Presentations*. New York, NY: Oxford University Press.

ONLINE RESOURCES FOR FUNCTIONAL NEUROANATOMY

University of Washington Brain Atlas: <http://www9.biostr.washington.edu/da.html>

An excellent resource for anyone trying to learn human neuroanatomy.

Harvard Medical School Brain Atlas: www.med.harvard.edu/AANLIB/home.html

Visit "Top 100 Brain Structures" under "Normal Brain"

The Brain from Top to Bottom: http://thebrain.mcgill.ca/flash/index_d.html (Author: Canadian Institute of Health Research). Material is presented for three type of learners (beginner, intermediate, advance) and topics are organized in five levels (social, psychological, neurological, cellular, molecular).

TEXTBOOKS RELATED TO NEUROPSYCHOLOGY

Blumenfeld, H. (2002). *Neuroanatomy through clinical cases*. Sunderland, MA: Sinauer Associates.

Lezak, M. D., Howieson, D. B. Loring, D. W., Hannay, H. J., & Fischer, J. (2004). *Neuropsychological assessment* (4th ed.). New York: Oxford University Press.

Ogden, J.A. (2005). *Fractured Minds: A Case Study Approach to Clinical Neuropsychology*. (2nd ed). Oxford University Press.

Zillmer EA, Spiers MV, Culbertson W. (2008). *Principles of neuropsychology*, 2nd edition. Thomson Learning, Inc.

COURSE SCHEDULE

This schedule is meant as a guide to how the course will progress. Students are expected to read the readings before the material is covered in class.

DATE	TOPIC	In-class exercises	READINGS / ASSIGNMENTS
Sept 5	Course overview	Discuss syllabus & course assignments	
Sept 12	History and methods in clinical neuropsychology	Student seminar topics assigned	Ch 1. History of neuropsychology (pp.3-35). From Zillmer EA, Spiers MV, Culbertson W. 2008. <u>Principles of neuropsychology</u> , 2nd edition. Thomson Learning, Inc. Rorden & Karnath (2004). Using human brain lesions to infer function: a relic from a past era in the fMRI age? <u>Nature Reviews</u> , 5, 812-819.
Sept 19	Brain structures and systems	Check out online functional neuroanatomy resources	Ch. 5. Neuroanatomy for the neuropsychologist. (pp. 61-82) From Morgan, J. E. & Ricker, J. H. (2008). <u>Textbook of Clinical Neuropsychology</u> . New York: Psychology Press, Taylor & Francis Group.
Sept 26	Neuropsychological theory and practice	**Discussion of Dennis paper: When, what, how and why of neuropsychological evaluation Testing considerations	Ch. 5. The neuropsychological examination: Procedures. In <u>Neuropsychological Assessment</u> . (2012). Edited by MD Lezak, DB Howieson, ED Bigler, D Tranel. **Dennis M et al (2014). Functional plasticity in childhood brain disorders: When, what, how, and whom to assess. <u>Neuropsychology Review</u> , 24(2). <i>Optional:</i> Silver et al. (2006). The importance of neuropsychological assessment for the evaluation of childhood learning disorders: NAN Policy and Planning Committee. <u>Archives of Clinical Neuropsychology</u> , 21(7), 741-744.
Oct 3	Neuropsychological Assessment	Demonstrations of neuropsychological measures	Quiz (15%) – focus on content discussed in class Guidelines for giving a talk
	TOPIC	PRESENTERS & SEMINAR TOPICS	READINGS
Oct 10	Attention deficit hyperactivity disorder (ADHD)	1. _____ 2. _____	**Duff CT & Sulla EM (2015). Measuring executive function in the differential diagnosis of ADHD: Does it really tell us anything? <u>Applied Neuropsychology: Child</u> : 4, 188-196.

	Suggested hot topics: <ul style="list-style-type: none"> - Why is ADHD a behaviourally diagnosed disorder? (What is the role of neuropsych measures in the assessment of ADHD) - Is attention impaired in ADHD? - Does increasing academic demands on young children affect the diagnosis of ADHD? - Do stimulants improve cognitive function? 		
Oct 17	READING WEEK		
Oct 24	Learning Disabilities (LD)	1. _____ 2. _____	**Ch. 6. Dyslexia. (pp. 45-81). RL Peterson & LM McGrath. In BF Pennington (2009). <u>Diagnosing Learning Disorders. A neuropsychological framework</u>. 2nd edition. Guilford Press: New York.
	Suggested hot topics: <ul style="list-style-type: none"> - Evidence for a symbolic representation of numbers in the brain - Cognitive factors that are implicated in math learning difficulties - Brain changes following reading intervention 		
Oct 31	Autism	1. _____ 2. _____	Schroeder et al (2010). The neurobiology of autism: Theoretical applications. <u>Research in Autism Spectrum Disorders</u>, 4 (4), 555-564.
	Suggested hot topics: <ul style="list-style-type: none"> - Global versus local processing in autism - Do brain differences explain sex-related differences in social brain function in autism? - Is motor learning impaired in autism? - Neurobiological correlates of autism (e.g. cerebellar involvement, role of frontal-striatal circuit in executive functioning). 		
Nov 7	Depression	1. _____ 2. _____	aan het Rot M, Mathew SJ, Charney DS. (2009). Neurobiological mechanisms in major depressive disorder. <u>Can Med Assoc J</u>, 180(3): 305-313.
	Suggested hot topics: <ul style="list-style-type: none"> - Gene by environment interaction in the development of depression: polymorphisms of the serotonin transporter (Ciccetti et al, 2007). - Mindfulness training and depression - Attentional impairment as a core feature of major depressive disorder 		
Nov 14	Anxiety	1. _____ 2. _____	Ch. 6. Neuropsychological considerations in child and adolescent anxiety. Larson M, South M, Merkle T. (2011). In <u>Handbook of Child and Adolescent Anxiety Disorders</u>. Edited by McKay D, Storch EA: Springer: New York.
	Suggested hot topics: <ul style="list-style-type: none"> - Cannabis use and anxiety - Attentional bias in anxiety disorders - Contribution of the amygdala to fear and fear learning - Gene x environment interactions and anxiety symptoms 		

Nov 21	Traumatic brain injury (TBI)	1. _____ 2. _____	Ch. 11. Donders: TBI of childhood. In: Morgan, J. E. & Ricker, J. H. (2008). <u>Textbook of Clinical Neuropsychology</u> . New York: Psychology Press, Taylor & Francis Group.
Suggested hot topics: <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 - Predictors of recovery after moderate/severe TBI - Neurodegenerative changes following TBI 			
Nov 28	Psychotic disorders TAKE HOME TEST #1 (20%)	1. _____ 2. _____	Palmer BW, Dawes SE, Heaton RK (2009). What do we know about neuropsychological aspects of schizophrenia? <u>Neuropsychol Review</u> , 19:365-84.
Suggested hot topics: <ul style="list-style-type: none"> - Frontal-executive deficits in schizophrenia - Long-term course of cognitive functioning in schizophrenia - Neurodevelopmental hypothesis of schizophrenia - Predictors of outcome in the psychosis prodrome. 			
Dec 5	(no class)	*DUE Responses to take-home test – pt 1	
DECEMBER BREAK!!!			
Jan 9	Cerebrovascular disorders	1. _____ 2. _____	Ch 12. Cerebrovascular disorders and tumors (pp.340-357). From Zillmer EA, Spiers MV, Culbertson W. 2008. <u>Principles of neuropsychology</u> , 2nd edition. Thomson Learning, Inc.
Suggested hot topics: <ul style="list-style-type: none"> - Neuropsychological impairment associated with stroke (focus on aphasia, dysexecutive syndrome, etc.) - Impact of right hemisphere stroke: Neglect - Executive function following childhood stroke: impact of age and lesion size 			
Jan 16	Multiple Sclerosis	1. _____ 2. _____	Till et al. (2011). MRI correlates of cognitive impairment in pediatric onset MS. <u>Neuropsychology</u> , 25(3):319-332. Calabrese et al (2006). Neuropsychology of MS. <u>J Neurology</u> , 253(S1):1-15
Suggested hot topics: <ul style="list-style-type: none"> - How does reduced processing speed affect higher-order cognitive functioning? (Leavitt et al, 2011) - The role of cognitive and brain reserve when studying neurodegeneration (see Sumowski) - Benefits of physical activity on slowing disease progression in MS 			

Jan 23	Epilepsy & Seizure disorders <i>*Groups assigned for grant project</i>	1. _____ 2. _____	Westerveld M. Ch. 10. Neuropsychology in pediatric epilepsy. (pp. 149-157). From Morgan, J. E. & Ricker, J. H. (2008). <u>Textbook of Clinical Neuro-psychology</u> . New York: Psychology Press, Taylor & Francis Group.
Suggested hot topics: <ul style="list-style-type: none"> - Memory impairment associated with seizure disorder - Neuroplasticity of language system in young patients with epilepsy 			
Jan 30	Mild Cognitive Impairment and Alzheimer's disease (AD)	1. _____ 2. _____	Caselli et al. (2014). The neuropsychology of normal aging and preclinical Alzheimer's disease. <u>Alzheim & Dementia</u> ,10:84-92. Ogden JA (2005). 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.
Suggested hot topics: <ul style="list-style-type: none"> - When is memory impairment considered abnormal in an older person? - Spared vs. preserved memory systems in AD 			
Feb 6	Subcortical dementias (Parkinson's, Huntington's Disease) <i>*Sign-up for grant presentation dates</i>	1. _____ 2. _____	Ogden JA (2005). Ch. 16. Huntington's disease (pp.276-303). In <u>Fractured Minds: A Case Study Approach to Clinical Neuropsychology</u> . (2 nd ed). Oxford University Press. Optional: Alzahrani H & Venneri A. (2015). Cognitive and neuroanatomical correlates of neuropsychiatric symptoms in PD: A systematic review. <u>J Neurolog Sci</u> , 356:1-2: 32-44.
Decision making in Parkinson's disease Does dancing improve Parkinson's Disease? Cognitive reserve as a protective factor for subcortical dementias			
Feb 13	Neurotoxic exposures <i>*Receive take-home Test 2 questions (15%)</i>	1. _____ 2. _____	<i>Intro to grant writing (Dr. Till)</i> Discussion of sample grants
Suggested hot topics: <ul style="list-style-type: none"> - <i>Chemobrain (long-term effects of chemotherapy)</i> - <i>Endocrine disruptors</i> - <i>Developmental neurotoxicity of lead</i> 			

Feb 20	READING WEEK: NO CLASS	
Feb 27	Recovery, rehabilitation and intervention (Dr. Till) 1. _____ 2. _____	Keshavan et al. (2014). Cognitive training in mental disorders: Update and future directions. Am J Psychiatry: A1-13. <u>DUE</u>: Responses to take-home questions – pt 2
Mar 5	Grant Presentations 1. 2. 3.	
Mar 12	Grant Presentations 1. 2. 3.	
Mar 19	Grant Presentations 1. 2. 3.	
Mar 26	Grant Presentations 1. 2. 3.	<u>DUE</u>: Written grant proposal group project (15%)
Apr 2	Course summary; Ethical and theoretical issues in understanding brain-behaviour relations	

**Last day to add course with permission of instructor (October 22). Last date to drop course without receiving a grade (Feb 5).*

As the discussant, you should be prepared to discuss the following:

- **Key Learning Objectives** – Identify 3-5 objectives for someone who would set out to learn about the topic. Your major take-away points should be specific, such as “why is this topic important?”, “how has this topic been approached methodologically?”, or “what did you find interesting about the topic?”
- **Concept List** – Note any terms or constructs of which you are unfamiliar or that are new/relevant to your topic.
- **Questions** – You will prepare 2-3 questions to stimulate curiosity and facilitate discussion about the reading. Strive to create questions that encourage your peers to think critically and actively about the reading. Thought provoking questions could include critiquing or challenging an argument made by the author, comparing/contrasting the reading to another topic discussed in class.