NROD67 Psychobiology of Aging
Tentative Syllabus 2020

Instructor: Janelle C LeBoutillier
Office: S557
Email: leboutillier@utsc.utoronto.ca

Lecture: Tues 11-1 pm on-line synchronous

Office Hours: Wed 12-1 by appointment

Fascinating psychological and biological questions cluster around the phenomenon of development and aging. Indeed, various lines of research are helping us to understand the aging process.

In this seminar course we will explore the neurobiological changes that occur during the process of aging and the relationship between these neurobiological changes and the cognitive changes that are experienced in the aged. We will examine both normal age-related changes and the cognitive changes that occur in age related disease states. Some of the questions we will discuss in this course include the following. Does every species age in the same way as the human? Is there a fundamental process of "aging" common to all organisms? How does the aging process deviate from the "normal" to cause aging-related disorders in long-lived species? Can one prevent and/or modify the aging process? What roles do nature and nurture play in this process? Can we learn something from various human lifestyles, diets, cultures, environments and even from other species in order to enhance healthy aging? Indeed, the quest to maintain a healthy, long life by mankind has been going on from time immemorial. Past and current research has focused on beginning to answer some of these questions. As we progress through this course we will observe that advances in aging research are contributed by worldwide researchers who cut across many disciplines.

Text: There is no text book for this course. Instead you will read various journal articles on topics related to aging.

Learning Outcomes:

By the end of the course you will:

1. Increase your confidence in oral scientific communication of course content in weekly classes.
2. Develop and write a research proposal on a chosen topic related to sleep and aging.
3. Assess current topics through in-class discussion and written assignments.
4. Demonstrate your ability to communicate effectively your research proposal
5. Critique research proposals on a topic you are familiar with.

Grading Scheme:

25% Leading In-Class Readings and Presentation
25% Class Participation, Discussion Board Postings, Pop Up Quizzes
2% Research Goals/Purpose
7% Proposal Outline
20% Evaluating Research Proposals (2 per person valued at 10% each)
6% Video clip
15% Final Research Proposal

Leading In-Class Assigned Reading and Presentations

Articles for the week are posted through the library for our course. Each week a group of students will be responsible for presenting the articles to the class and facilitating discussion of these articles. Each group should work together to come up with a good way to highlight the important issues discussed in the articles and to engage the rest of the class in a thoughtful and critical discussion of those issues. You will be graded on your ability to summarize/highlight the important issues in the articles, your presentation skills, your understanding of the readings, and your ability to lead and engage your peers in a group discussion. Your grade will be based on the group performance and your individual contributions. Each group is required to submit a near complete ppt of their presentation to me no later than noon Monday for the next day class. Remember, students are expected to have read the assigned readings in preparation for the class. You do not need to present on all of the information contained within the articles. You should discuss other empirical papers on your topic that complement the readings and our understanding of research in the field.

Participation:

You are expected to read assigned papers before each class, attend regularly, be on time, and be engaged in our class discussion. All course readings can be obtained through the library course reserves tab in Quercus. In addition, students will be required to submit a weekly thought question/idea/issue based on the assigned readings to our Quercus discussion board. This question/idea/issue must be posted no later than 5 pm of the Sun prior to our Tues lecture. You are not required to post an answer to the discussion board posting but may be called upon during the class to provide your answer.

Research Proposal:

There are several components of your research proposal that will be graded and these are described below. You may choose to work with a partner on your research proposal and you will each receive the same final grade for this submission. Please note, while you may work with a partner on the hypothesis, outline and final paper, all students must evaluate the proposals assigned to them independently. You have a choice to complete your research proposal on 1. Covid19 and Aging or 2. Sleep and Aging.

Research Goals/Purpose

The hypothesis/purpose (i.e. the proposed explanation for the phenomenon you are investigating) is not valued at a high proportion of your final grade but is due early in the term to ensure you are working towards the final product well in advance of the deadline and approved by the instructor. This should be clearly and concisely written and submitted to Quercus (grade Column = Goals) no later than Feb 2. If you are working with a partner one person may submit the assignment with both authors names on it.

Proposal Outline

You should submit your proposal outline no later than Feb 22 at 9 am to Quercus (grade column = proposal outline). Dates and times for individual meetings will be assigned during class. You are expected to demonstrate that you have examined the literature, have a list of references to support the research done to date (you are not expected to have your final list of references) and an idea of how you will conduct this research.

The purpose of the proposal outline is to ensure that you have

- done sufficient preliminary reading/research in the area of your interest
- thought about the issues involved and are able to provide more than a broad description of the topic which you are planning to research.

Final Research Proposal:

The challenge in this assignment is to convince members of the scientific community and our class that you

- have identified a scientific problem
- have reviewed the theoretical background
- have a methodical approach to solve the problem
- have a realistic time frame and reasonable costs associated with the project.

The following sections should be included in this paper:

Project title

Summary statement of the research project:
This one paragraph summary should focus on the research topic, its new, current and relevant aspects. While this will appear at the start of your proposal, you should write this section last.

Review of research literature
A short and precise overview about the current state of research that is immediately connected with your research project.

- Reference the most important contributions of other scientists.
- Discuss the theoretical scope or the framework of ideas that will be used to back the research.
- State clearly how your research will contribute to the existing research.

Objective of the research project
Give a concise and clear outline of the academic (you may also include non-academic, e.g. social) objectives that you want to achieve through your project. Be clear as to why the intended research is important.

Outline the project
This is the central part of your research outline.

- Detail your research procedure.
- Provide a timetable you will follow.
- Describe the intended methods of data gathering, include the controls you will include, the statistical methods to be used
- You are not expected to provide a budget

References
List all articles mentioned in your research

There will be no results or discussion section for this assignment

You are encouraged to be as concise as possible in this final proposal while adequately covering the topic. This proposal should be a maximum of 10 pages, double spaced. Late papers will be accepted but docked 10% per day or part of a day. This proposal is due at the start of class on March 9, 2020 and should be submitted through Quercus to the grade column marked Proposal Peer Review. Please note, if you are working with a partner you each must submit a copy of your paper independently. The paper will be peer reviewed and the author will receive the comments.

Evaluating Research Proposals
You will evaluate class research proposals and provide constructive feedback and suggestions to the author. You should expect to review 2 proposals for your peers. Only I will evaluate your feedback but the author will receive your comments. On Mar 23, 2020 you should return 2 copies of each proposal evaluated. These evaluations should be a maximum of 2 pages. You may find it helpful comment directly on the pdf or word document you are assigned but should still include a written summary.

Video Clip

You will prepare a short video clip highlighting your proposal, its importance and why you believe this work should be further investigated and "funded". The video clip should not be longer than 5 minutes and may be captured on your cell phone or other video capturing device or directly through Quercus. The due date is Mar 2, 2020.

Final Proposal Submission
Your final proposal which will be evaluated by me is due Mar 30 at the start of class. This proposal should be submitted to TURNITIN electronically through Quercus. TURNITIN will time stamp your submissions so please do not submit late. A printed version should be brought to class. This copy should be double spaced but can be printed double sided.

First, some background information on this program. Turnitin.com is a tool that assists in detecting textual similarities between compared works i.e.: it is an electronic resource that assists in the detection and deterrence of plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site.

"Normally, students will be required to submit their course essays to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site"

Psychology Department Missed Term Work Policy, WINTER 2021

For missed term work (assignments and term tests) due to illness, emergency, or other mitigating circumstances, please follow the procedures outlined below.

Notes:

- The following reasons are not considered sufficient for missed term work: travel for leisure, weddings, personal commitments, work commitments, human error.
- Missed Final Exams are handled by the Registrar's Office and should be declared on eService: http://www.utsc.utoronto.ca/registrar/missing-examination
- Instructors cannot accept term work any later than five business days after the last day of class**.** Beyond this date, you would need to file a petition with the Registrar's Office: https://www.utsc.utoronto.ca/registrar/term-work

Accommodations for Illness or Emergency:

For missed work due to ILLNESS OR EMERGENCY, please complete the following **two-step** process:

1. Complete the **Request for Missed Term Work Accommodations Form** (http://uoft.me/PSY-MTW) and email it to Keely Hicks at keely.hicks@utoronto.ca ,

   and

2. **Declare your absence** on ACORN (Profile & Settings > Absence Declaration)

Deadline: You must complete the above steps **within 3 business days** of the missed work.

Note: For this semester, we do not require any additional supporting documentation (ex. medical notes) to support your missed term work accommodation request.

Accommodations for Academic Conflicts:

For missed term work due to an ACADEMIC CONFLICT (i.e. two quizzes or tests scheduled at the same time), please complete the following process:

1. Complete the **Request for Missed Term Work Accommodations Form** (http://uoft.me/PSY-MTW), choosing "Other" as your reason for missed work and explaining the conflict in the space provided.
2. Take screenshots of your course homepages that demonstrate the conflict.
3. Email the form and screenshots to Keely Hicks (keely.hicks@utoronto.ca).

Deadline: You should report the conflict to Keely Hicks (keely.hicks@utoronto.ca) **at least two weeks (10 business days) before the date of the activity,** or as soon as possible if it was not possible to identify the conflict earlier.

Note: Multiple assignments due on the same day are not considered conflicts. Accommodations may only be possible in the case of quizzes and tests that are both scheduled during the same discrete period. Back-to-back tests/quizzes are not considered conflicts.

Note: Students are responsible for keeping their course timetables conflict-free. Students who choose to register in two synchronous courses with overlapping lecture/tutorial/lab schedules may not necessarily be accommodated.

Accommodations for Religious Conflicts:

For missed term work due to a RELIGIOUS CONFLICT, please complete the following process:

1. Complete the **Request for Missed Term Work Accommodations Form** (http://uoft.me/PSY-MTW), choosing "Other" as your reason for missed work and noting "Religious conflict" in the space provided.
2. Email the form to Keely Hicks (keely.hicks@utoronto.ca).

Deadline: You should report the conflict to Keely Hicks (keely.hicks@utoronto.ca) **at least two weeks (10 business days) before the date of the activity,** or as soon as possible if it was not possible to identify the conflict earlier.

Accommodations for Time Zone Conflicts:

If you are physically in a different time zone and a quiz or midterm is scheduled outside of 7:00am to midnight in your local time, please complete the following process:

1. Complete the **Time Zone Conflict Form** (https://uoft.me/PSY-TimeZone), and
2. Email the form to Keely Hicks (keely.hicks@utoronto.ca)

Deadline: You should report the conflict to Keely Hicks (keely.hicks@utoronto.ca) **at least two weeks (10 business days) before the date of the activity,** or as soon as possible, if it was not possible to identify the conflict earlier.

Accommodations for Students Registered with AccessAbility Services:

For missed **TERM TESTS** due to ACCESSABILITY REASONS:

- **Contact your AccessAbility consultant** and have them email Keely (keely.hicks@utoronto.ca) detailing accommodations required.

For missed **ASSIGNMENTS** due to ACCESSABILITY REASONS:

- If your desired accommodation is **within the scope** of your Accommodation Letter (ex. your letter includes "extensions of up to 7 days" and you need 3 days):
    1. Complete the **Request for Missed Term Work Accommodations Form** (http://uoft.me/PSY-MTW).
    2. Email the form and your **Accommodation Letter** to Keely Hicks (keely.hicks@utoronto.ca).
- If your desired accommodation is **outside the scope** of your Accommodation Letter (ex. your letter includes "extensions of up to 7 days" but you need more time than that):
    1. **Contact your AccessAbility consultant** and have them email Keely Hicks (keely.hicks@utoronto.ca) detailing the accommodations required.

After submitting your documentation:

Within approximately one to five business days, you will receive a response from your instructor detailing the accommodations to be made (if any).

You are responsible for checking your official U of T email and Quercus course announcements daily, as accommodations may be time-critical.

You should continue to work on your assignments to the best of your ability, as extension accommodations may be as short as one business day, depending on the nature of the illness/emergency.

If an accommodation has been granted but you are unable to meet the conditions of the accommodation (ex. you need a longer extension, or you missed a make-up test), you will need to repeat the missed term work procedure and submit additional forms to request further accommodation. Note that in the case of a missed make-up test, an opportunity to write a second make-up test may not be provided.

Completion of this form does not guarantee that accommodations will be made. The course instructor reserves the right to decide what accommodations (if any) will be

made. Failure to adhere to any aspect of this policy may result in a denial of your request for accommodation.

Missed Accommodations

If an accommodation is granted but a continued illness/emergency prevents you from meeting the requirements of your accommodation, you must repeat the missed term work procedure to request additional accommodations.

(E.g.) If you miss a make-up midterm, you would need to submit another Request for Missed Term Work Accommodations form and declare your extended absence on ACORN.

Importance of Three Business Day window:

If you are unable to submit your documents within the three business day window, **you must email Keely (keely.hicks@utoronto.ca) within the three business day window** to explain the nature of the delay, and when you will be able to provide your documents. Exceptions to the documentation deadline will only be made under **exceptional circumstances.**

Questions?

If you have any questions about this Missed Term Work policy, please contact Keely Hicks (keely.hicks@utoronto.ca) **well before** the date of the test / assignment deadline to describe your circumstances and inquire about procedures.

General Information which you should be aware of:

The University of Toronto is dedicated to fostering an academic community in which the learning and scholarship of every member may flourish, with vigilant protection for individual human rights, and a resolute commitment to the principles of equal opportunity, equity and justice.

ACCESSABILITY STATEMENT
Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible. I will work with you and AccessAbility Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC AccessAbility Services staff (located in S302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416) 287-7560 or ability@utsc.utoronto.ca.

ACADEMIC INTEGRITY STATEMENT
Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm)

outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

IN PAPERS AND ASSIGNMENTS: Using someone else's ideas or words without appropriate acknowledgement. Submitting your own work in more than one course without the permission of the instructor. Making up sources or facts. Obtaining or providing unauthorized assistance on any assignment.

ON TESTS AND EXAMS: Using or possessing unauthorized aids. Looking at someone else's answers during an exam or test. Misrepresenting your identity.

The Centre for Teaching and Learning (CTL) is available to support you in your writing, English language, and math and stats needs. It offers online tutoring and consultations and has a variety of helpful online resources. For more information, please visit CTL's Academic Learning Support site at http://uoft.me/AcademicLearningSupport.

Tentative Course Schedule

DATE	TOPIC	READINGS
Jan 12	Course Introduction	doi.org/10.1523/JNEUROSCI.1527-19.2019
Jan 19	Neurobiology of Healthy Aging	Geldmacher 2012 Imhof 2007 Boyle 2013
Jan 26	Models of Aging	Youssef 2016 Engle 2012 Alexander 2012 Roberson 2012
Feb 2	Cognitive Training and Enhancers Research goal/s due no later than Feb 2	Davis 2017 Punzi 2017 Jiang 2016
Feb 9	Lifestyle Enrichment and Education	Huang 2020 Scharaga 2015 Santos 2015 Yaffe 2014 Festini 2016
Feb 16	Reading Week	
Feb 23	Proposal outlines due no later than Feb 22 Individual Meetings to Discuss Proposal Outlines Scheduled	
Mar 2	Vascular Cognitive Impairments and Stress Video clips Due	Jellinger 2013 Hestad 2020 De la Torre 2004

Mar 9	Anatomy and Brain Structure Proposal Due	Ousman 2018 Jin 2018 Cook 2017
Mar 16	AD and MCI	Bjorkli 2020 Invitto 2018 Tampi 2015
Mar 23	Nutrition Proposal Evaluations Due	Swaminathanand 2014 Gopinath 2016 Granzotto 2014 Kent 2014 Hsu 2014
Mar 30	Exercise Final Proposal Due	Bherer 2013 Chapman 2013 Petersen 2018 McGregor 2013 Wei 2014
April 6	In Class Video Presentations and Course Wrap up	

Readings:

Alexander GE, Ryan L, Bowers D, Foster TC, Bizon JL Gelmacher DS & Glisky EL. (2012). Characterizing cognitive aging in humans with links to animal models. Frontiers in Aging Neuroscience. doi: 10.3389/fnagi.2012.00021

Bherer L, Erickson KI & Liu-Ambrose T. (2013). A review of the effects of physical activity and exercise on cognitive and brain functions in older adults. Journal of Aging Research, Vol 2013, doi.org/10.1155/2013/657508

Bjorkli1 C, Sandvig A & Sandvig I (2020). Bridging the Gap Between Fluid Biomarkers for Alzheimer's Disease, Model Systems, and Patients Frontiers in Aging Neuroscience doi: 10.3389/fnagi.2020.00272

Boyle PA, et al. (2013). Relation of neuropathology with cognitive decline among older persons without dementia. doi: 10.3389/fnagi.2013.00050

Chapman SB. et al. (2013). Shorter term aerobic exercise improves brain, cognition, and cardiovascular fitness in aging. Frontiers in Aging Neuroscience. doi: 10.3389/fnagi.2013.00075.

Cook AH, Sridhar J, Ohm D, Rademaker A, Mesulam,MM, Weintraub,S, Rogalski E (2017). Rates of Cortical Atrophy in Adults 80 Years and Older With Superior vs

Average Episodic Memory. JAMA. 2017;317(13):1373-1375. doi:10.1001/jama.2017.0627

Davis, N. (2017). Brain stimulation for cognitive enhancement in the older person: State of the art and future directions. J Cogn Enhanc 1:337–344 DOI 10.1007/s41465-017-0036-1

De la Torre JC (2004), Is Alzheimer's disease a neurodegenerative or a vascular disorder? Data, dogma, and dialectics. Lancet Neurol. 3(3): 184-190.

Engle JR & Barnes CA. (2012). Characterizing cognitive aging of associative memory in animal models. Frontiers in Aging Neuroscience. doi: 10.3389/fnagi.2012.00010

Festini SB. (2016). The busier the better: Greater busyness is associated with better cognition . Frontiers in Aging Neuroscience. doi: 10.3389/fnagi.2016.00098

Geldmacher DS, Levin BE & Wright CB. (2012). Characterizing healthy samples for studies of human cognitive aging. Frontiers in Neuroscience doi: 10.3389/fnagi.2012.00023

Gopinath et al. (2016**).** Association between carbohydrate nutrition and successful aging over 10 years. J Gerontol A Biol Sci Med Sci, 2016, Vol. 71, No. 10, 1335–1340. doi:10.1093/gerona/glw091

Granzotto A & Zatto P. (2014). Resveratrol and Alzheimer's disease: message in a bottle on red wine and cognition. Frontiers in Aging Neuroscience. doi:10.3389/fnagi.2014.00095

Hestad K, Engedal K, Horndalsveen P and Strand B.H. (2020). Blood Pressure in Different Dementia Disorders, Mild Cognitive Impairment, and Subjective Cognitive Decline. Frontiers in Aging Neuroscience. doi: 10.3389/fnagi.2020.00257

Huang Z, Guo Y, Ruan Y, Sun S, Lin T, Ye J, Li J, He L, Wang S, Shi Y and Wu F (2020). Associations of Lifestyle Factors With Cognition in Community-Dwelling Adults Aged 50 and Older: A Longitudinal Cohort Study. Frontiers in Aging Neuroscience. doi.org/10.3389/fnagi.2020.601487

Huhn S, Masouleh SK, Stumvoll M., Villringer A & Witte V. (2015). Components of a Mediterranean diet and their impact on cognitive functions in aging. Frontiers in Aging Neuroscience. doi: 10.3389/fnagi.2015.00132

Hsu TM & Kanoski SE. (2014). Blood-brain barrier disruption: mechanistic links between Western diet consumption and dementia. Frontiers in Aging Neuroscience. doi: 10.3389/fnagi.2014.00088

Imhof A et al. (2007). Morphological substrates of cognitive decline in nonagenarians and centenarians: a new paradigm? J Neurscience. 257(1-2): 72-79.

Invitto S. et al. (2018). Potential role of OERP as early marker of mild cognitive impairment. Frontiers in Aging Neuroscience. doi: 10.3389/fnagi.2018.00272

Jellinger KA. (2013). Pathology and pathogenesis of vascular cognitive impairment—a critical update. doi: 10.3389/fnagi.2013.00017

Jiang L et al. (2016) Cortical thickness changes correlate with cognition changes after cognitive training: Evidence from a chinese community study. Frontiers in Aging Neuroscience doi: 10.3389/fnagi.2016.00118

Jin K. (2018). Relationship between sulcal characteristics and brain ageing. Front. Aging Neurosci. doi: 10.3389/fnagi.2018.00339

Kent B. (2014). Synchronizing an aging brain: can entraining circadian clocks by food slow Alzheimer's disease? Frontiers in Aging Neuroscience.
doi: 10.3389/fnagi.2014.00234

McGregor KM, et al. (2013). Effects of aerobic fitness on aging-related changes of interhemispheric inhibition and motor performance. doi: 10.3389/fnagi.2013.00066

Ousman S .and Palmer AL (2018). Astrocytes and Aging. Front. Aging Neurosci.
doi: 10.3389/fnagi.2018.00337

Petersen CB. et al. (2018). Physical activity and the development of visible age-related signs in the general population: a prospective cohort study. Healthy Aging Research.
http://dx.doi.org/10.1097/HXR.0000000000000013

Punzi e t al. (2017). Modafinil-induced changes in functional connectivity in the cortex and cerebellum of healthy elderly subjects. Frontiers in Aging Neuroscience. doi: 10.3389/fnagi.2017.00085

Roberson, et al. (2012). Challenges and opportunities for characterizing cognitive aging across species. Frontiers of Neuroscience Aging.
doi: 10.3389/fnagi.2012.00006

Santos NC, et al. (2014). Clinical, physical and lifestyle variables and relationship with cognition and mood in aging: across-sectional analysis of distinct educational groups. Frontiers in Aging Neuroscience doi: 10.3389/fnagi.2014.00021

Scharaga R, Holtzer R. (2015). Preliminary findings of the Brief Everyday Activities Measurement (BEAM) in older adults. The Journal of Nutrition Health and Aging 19:929-934

Swaminathan A. and Gregory AJ. (2014). Nutrition and prevention of Alzheimer's dementia. Frontiers in Aging Neuroscience. doi: 10.3389/fnagi.2014.0028

Tampi RR, et al. (2015). Mild cognitive impairment: A comprehensive review. Healthy Aging Research 4:39

Wei G. et al. (2014). Tai Chi Chuan optimizes the functional organization of the intrinsic human brain architecture in older adults. Frontiers in Aging Neuroscience. doi: 10.3389/fnagi.2014.00074

Yaffe K. et al. (2014). Lifestyle and health-related risk factors and risk of cognitive aging among older veterans. Alzheimer's & Dementia 10 S111-S121

Youssef SA, Capucchio MT, Rofina JE, Chambers JK, Uchida K, Nakayama H and Head E. (2016). Pathology of the Aging Brain in Domestic and Laboratory Animals, and Animal Models of Human Neurodegenerative Diseases. Veterinary Pathology Vol. 53(2) 327-348 DOI: 10.1177/0300985815623997