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 being 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.

Grading Scheme:

25% Leading In-Class Readings and Presentation
20% Class Participation, Discussion Board Postings, Pop Up Quizzes
2% Hypothesis for Research Proposal
8% Proposal Outline
20% Evaluating Research Proposals
5% Video Clip
20% 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 Tues for the next day class. Remember, students are expected to have read these 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 and be engaged in our class discussion. All course readings can be obtained through the course reading tab in BB. In addition, students will be required to submit a weekly thought question/idea/issue based on the assigned readings to our BB discussion board. This question/idea/issue must be posted no later than noon of the Tues prior to our Wed 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. All proposals will address an aspect of sleep and aging. We will discuss the range of topics in class in depth.

Hypothesis for Research Proposal

The hypothesis (ie 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. These should be clearly and concisely written and submitted to me electronically by the due date. Please mark Hypothesis and your name in the subject line.

Proposal Outline
You should bring a hard copy of your proposal outline to your individual meeting. You are expected to demonstrate that you have examined the literature, have an incomplete list of references to support the research done to date and an idea of how you will conduct this research.

**Research Proposal:**

The purpose of the proposal 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.

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 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. Your proposal should be double space with the only exception being that references may be single spaced. Late papers will be accepted but docked 10% per day unless a medical note is provided. A version of this proposal is due at the start of class on March 8, 2016. You will bring printed copies (number to be confirmed) which can be double spaced to class without your name on them. This copy of the paper will be peer reviewed and the author will receive the comments prior to the submission of the final proposal to me for evaluation through TURNITIN.

Evaluating Research Proposals
You will evaluate class research proposals and provide constructive feedback and suggestions to the author. You should expect to review 3 proposals for your peers. Only I will evaluate your feedback but the author will receive your comments. These are due On Mar 15. You should return 2 copies of each proposal evaluated. Only 1 copy should have your name on it. These evaluations should be a maximum of 2 pages.

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. The file should be submitted to me by email with your name and Video Clip in the subject line. The due date is Mar 1.

Final Proposal Submission
Your final proposal which will mark is due Mar 22 at the start of class. This proposal should be submitted to TURNITIN electronically. TURNITIN will time stamp your submissions so please to not submit late. Details on the Turnitin are as follows:

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”

Students will submit their final paper to the turnitin.com site (www.turnitin.com). You will need the following information to submit your proposal.

Course: NROD67
Class ID: 14326060
Password: graduating

Missed Term Work due to Medical Illness or Emergency:

All students citing a documented reason for missed term work (this includes assignments and midterm exams) must bring their documentation to the Undergraduate Course Coordinator, Ainsley Lawson, within three (3) business days of the term test / assignment due date. All documentation must be accompanied by the departmental Request for Missed Term Work form (http://uoft.me/PSY-MTW).

In the case of missed term work due to illness, only an original copy of the official UTSC Verification of Illness Form (http://uoft.me/PSY-MED) will be accepted. Forms are to be completed in full, clearly indicating the start date, anticipated end date, and severity of illness. The physician’s registration number and business stamp are required.

In the case of other emergency, a record of visitation to a hospital emergency room or copy of a death certificate may be considered.

Forms should be dropped off in SW427C between 9 AM - 4 PM, Monday through Friday. Upon receipt of the documentation, you will receive an email response from the Course Instructor / Course Coordinator within three business days. The Course Instructor reserves the right to decide what accommodations (if any) will be made for the missed work.

Note that this policy applies only to missed term work (assignments and midterms). Missed final exams are dealt with by the Registrar’s Office (http://www.utsc.utoronto.ca/registrar/missing-examination).

Failure to adhere to any aspect of this policy may result in a denial of your request for accommodation.
<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPIC</th>
<th>READINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 4</td>
<td>Course Introduction</td>
<td></td>
</tr>
<tr>
<td>Jan 11</td>
<td>Neurobiology of Healthy Aging</td>
<td>Geldmacher 2012</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kennard 2011</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Imhof 2007</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Boyle 2013</td>
</tr>
<tr>
<td>Jan 18</td>
<td>Models of Aging</td>
<td>Engle 2012</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alexander 2012</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Roberson 2012</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Roth 2004</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bizon 2012</td>
</tr>
<tr>
<td>Jan 25</td>
<td>Cognitive Training</td>
<td>Sternberg 2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Edwards 2009</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jiang 2016</td>
</tr>
<tr>
<td>Feb 1</td>
<td>Enrichment, Education and Lifestyle</td>
<td>Scharaga 2015</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Santos 2015</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hanna-Pladdy 2012</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Festini 2016</td>
</tr>
<tr>
<td>Feb 8</td>
<td>No class, work on proposal</td>
<td></td>
</tr>
<tr>
<td>Feb 15</td>
<td>Vascular Cognitive Impairments</td>
<td>Jellinger 2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>De la Torre 2004</td>
</tr>
<tr>
<td>Feb 22</td>
<td>Reading Week No classes</td>
<td></td>
</tr>
<tr>
<td>Mar 1</td>
<td>Vascular Cognitive Impairments CONT</td>
<td>Hinman 2007</td>
</tr>
<tr>
<td></td>
<td>Cortical Changes, Oxidative Stress/Chronic Stress</td>
<td>Richards 2009</td>
</tr>
<tr>
<td></td>
<td>Video clips Due</td>
<td>Gems 2008</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Christensen 2015</td>
</tr>
<tr>
<td>Mar 8</td>
<td>AD and MCI</td>
<td>Tampellini 2015</td>
</tr>
<tr>
<td></td>
<td>Proposal Due</td>
<td>Granzotto 2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tampi 2015</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Castanho 2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marchionni 2013</td>
</tr>
<tr>
<td>Mar 15</td>
<td>Nutrition</td>
<td>Sinclair 2005</td>
</tr>
<tr>
<td></td>
<td>Proposal Evaluations Due</td>
<td>Huhn 2015</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kent 2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hsu 2014</td>
</tr>
<tr>
<td>Mar 22</td>
<td>Aerobic Exercise</td>
<td>Coubard 2011</td>
</tr>
<tr>
<td></td>
<td>Final Proposal Due</td>
<td>Muscari 2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>McGregor 2013</td>
</tr>
<tr>
<td>Mar 29</td>
<td>Non Aerobic Exercise</td>
<td>Pons van Dijk, 2013</td>
</tr>
</tbody>
</table>
Readings:


