YORK UNIVERSITY FACULTY OF HEALTH DEPARTMENT OF PSYCHOLOGY	**PSYC 4270 3.0, Section M** **Seminar in Memory & Cognition** **Winter 2015** **Thursday 2:30 – 5:30 p.m.** **Building / Room: Vanier College (VC) / 114**

COURSE DETAILS

Instructor	**Dr. W. Dale Stevens**	**Email: stevensd@yorku.ca**
Office Hours	**By Appointment** **Sherman Health Science Research Centre, Room 2036 (or BSB 244)** **Office phone: 416.736.2100 x44662 [BUT PLEASE USE EMAIL]**	
Reading Materials	No textbook is required for this course. Instead, selected articles from the relevant literature will be assigned for reading each week for the various topics. (See **Schedule of Readings** below.)	
Course Description:	This course will survey a variety of topics in the area of human memory and its relationship with other cognitive processes, such as perception, conceptual processes, and executive function, primarily from a cognitive neuroscience perspective. Current theories and research on memory will be presented and discussed, focusing on the processes and systems involved at encoding, storage, and retrieval, as well as the errors of memory and the importance of memory in our everyday lives. Evidence derived from work with clinical populations with memory disturbances, healthy older individuals, research involving the use of animal models, and brain-imaging techniques to study the neural basis of memory and cognition will be explored. Students will be required to read and critically evaluate selected articles from the literature and engage in active discussion during classes, with a particular focus on ongoing debates in the field regarding a number of topics. *Prerequisites: Students should be familiar with basic principles of brain structure and function to fully appreciated the readings and material that will be presented. Official course pre-requisites include: AK/AS/SC/PSYC 1010 6.00 or AK/PSYC 2410 6.00, with a minimum grade of C; AK/AS/SC/PSYC 2030 3.00 or AK/PSYC 2530 3.00; one of AK/AS/SC/PSYC 2021PSYC 3.00, AK/AS/SC/PSYC 2020 6.00, AK/PSYC 2510 3.00; one of AK/PSYC 3130 3.00, AK/PSYC 3135 3.00, AK/PSYC 3260 3.00 (after Winter 2002), AS/SC/PSYC 3260 3.00, AK/AS/SC/PSYC 3265 3.00.*	
Evaluation:	Class Participation 20% Thought Papers (×4) 20% * Presentations 20% Term Paper Outline 10% (Due: **Beginning** of class, February 12, 2015) Term Paper 30% (Due: **Beginning** of the last class, April 2, 2015) (See detailed description of each component below under **Course Evaluation**) * Late thought papers will **not** be accepted. See policy for missed classes, presentations, and deadlines below. **Note: The last day to drop the course without receiving a grade on your transcript is March 6, 2015.**	

ACADEMIC POLICIES

Missed Classes, Presentations, and Deadlines

1. Students must email the instructor in advance of any missed class/presentation/deadline if at all possible; otherwise, within 24 hours following the missed class/presentation/deadline.

2. Appropriate documentation (See A, B below) verifying the circumstances for the missed class/presentation/deadline must be provided within one week (7 calendar days). Failure to provide appropriate documentation will result in: a grade of 0 for participation in a given class, thought papers, and presentations; a penalty of 10% per day for late Term Paper Outlines and Term Papers.

A. Classes, presentations, and deadlines for thought papers, term papers/outlines missed for medical reasons must be supported by an Attending Physician's Statement, which can be downloaded at the following link:
http://www.registrar.yorku.ca/pdf/attend_physician_statement.pdf

The Attending Physician's Statement must:

(i) Include the full name, mailing address and telephone number of the physician
(ii) State the nature of the illness and its duration
(iii) Include a statement that the illness and/or treatment would have SERIOUSLY affected the student's ability to study or perform over the period in question, not just that they were ill and were seen by a doctor. Notes without such wording will not be accepted.

NOTE: The instructor and/or psychology undergraduate office will follow-up on medical notes. Falsification of any documentation relating to an absence or missed deadline is a serious academic offence (see "Academic Policies" below).

B. Tests or exams missed for legitimate non-medical reasons must be supported by appropriate documentation (i.e., copy of a death certificate, automobile accident report, etc.) Pre-booked travel is not a legitimate excuse for missing classes, presentations, or deadlines.

Academic Policies

Students must familiarize themselves with the Senate Committee on Curriculum & Academic Standards webpage:
http://www.yorku.ca/academicintegrity/students/index.htm

Further information can be found here:
http://www.yorku.ca/secretariat/policies/document.php?document=69
http://secretariat-policies.info.yorku.ca/

Please also complete the tutorial on academic integrity:
http://www.yorku.ca/tutorial/academic_integrity/

Policy Regarding E-mail
All email correspondence to Dr. Stevens must include the course code (PSYC 4270) in the subject-header to prevent messages from being filtered as spam, and close with your full name and student number (e.g., "Jennifer Jones, 867530986"). A response from Dr. Stevens can be expected within 48 hours, not including weekends. Please re-send your message if you do not receive a reply within this timeframe. **Before contacting Dr. Stevens, reread the syllabus carefully first to determine if it answers your question.**

COURSE OUTLINE

DATE:	TOPIC:	ASSIGNMENT:
January 8, 2015	**Course Overview**	Thought Papers: 4 required; 5 maximum
January 15, 2015	**Approaches & Methods in Memory & Cognition Research**	Thought Paper #1
January 22, 2015	**Object Concepts & Semantic Memory**	Thought Paper #2
January 29, 2015	**Neurocognitive Specialization & Plasticity**	Thought Paper #3
February 5, 2015	**Implicit Memory** **Term-Paper Tutorial**	Thought Paper #4
February 12, 2015	**Priming & Repetition Suppression**	Thought Paper #5 **TERM PAPER OUTLINE DUE**
February 26, 2015	**Encoding & Perception**	Thought Paper #6
March 5, 2015	**Retrieval & Distortions**	Thought Paper #7
March 12, 2015	**Time & Space: Prospection & Spatial Cognition**	Thought Paper #8
March 19, 2015	**Executive Function & Working Memory**	Thought Paper #9
March 26, 2015	**Cognitive Neuroscience Lab Tour**	Trek to the Sherman Health Science Research Centre for a tour of MRI & TMS labs
April 2, 2015	**Neurocognitive Aging**	Thought Paper #10 **TERM PAPER DUE**

Resources
A number of valuable resources are available to students at York University.
Importantly, this includes the Writing Center. Please visit the website: http://www.yorku.ca/laps/writ/centre/

York University also offers both academic and crisis counseling services. For information, visit the Counseling and Development Centre website: http://www.yorku.ca/cds/

Please inform the instructor as soon as possible if there are extenuating circumstances that may interfere with the successful completion of the course requirements in order to make appropriate arrangements.

Course Evaluation:

Class Participation:
A large proportion of each class will be devoted to class discussion. Therefore, an evaluation of each student's participation makes up a considerable proportion of the overall grade for the course. Participation in the seminars includes being present and prepared for every class, having read the assigned readings, and engaging in discussion. Students will be expected to discuss the opinions, comments, and views expressed in their thought papers, and those expressed by their fellow students.

Thought Papers:
Students are required to submit "thought papers" on the readings at the beginning of class (excluding the first class). The purpose of the thought paper is to present your view of the readings in at least one of the following ways: describe the interesting or main questions and how well you believe they were addressed by one or more of the papers; evaluate the experimental design and/or the authors' interpretation of the findings; discuss ideas for theory or experiments that the paper(s) inspired; describe how the papers complemented or contradicted each other. The thought paper must demonstrate that the student has **read and critically evaluated** one or more of the readings. Importantly, the thought paper is NOT meant to summarize the readings, but rather to serve as a stimulus for class discussion.

Thought papers should be 1 (minimum) to 2 (maximum) pages long (double-spaced, 12-point font, 1-inch margins all around), not including the title page and references (at least 1 reference must be included). 4 thought papers are required, but you may submit up to 5 (only 1 per class), and the best 4 will be counted towards your final grade. Thought papers are due at the beginning of each class in which the relevant paper(s) is/are being covered, and will not be accepted late.

Presentation:
Each student will serve as a discussion leader and be responsible for presenting a seminar on one of the assigned topics. This will involve extracting the important issues of one or two of the readings, posing discussion questions for class, and leading/moderating the discussion. There will typically be 2 student presentations per class, so presenting students must coordinate with one another to ensure that their presentations are complementary and not overlapping or redundant.

To lead the discussion, it will be necessary to elaborate on the background and introduction of the paper to provide the theoretical context in which the main question or questions were asked in the paper. To do this well, you may need to read an additional article or two in order to be fully prepared to discuss the assigned paper. If you choose an empirical article, it will also be necessary to provide a concise description of the methods, the main findings, and interpretation of the findings. You should also share your perspective on, and evaluation of, the paper, and prepare several questions to discuss with the rest of the class. The questions can be points of confusion, issues for further consideration, follow-up research ideas, and so on. The presentation should take approximately 30 minutes, with another 15-30 minutes for class discussion.

Additionally, three students will evaluate each presentation and provide feedback via email to the presenter (sending a copy to the instructor as well) within the following week, as will the instructor. The reason for this is to provide valuable feedback to he presenter so that they can learn from the experience and improve their communication and presenting skills. A portion of each student's presentation grade will be based on her/his feedback to other student presenters.

Term Paper & Outline:
For your term paper, you may write a comprehensive review, or a research proposal, related to any of the topics covered throughout the course. If you choose to write a review paper, it must have a clear thesis and present a novel argument or synthesis of the ideas presented and/or discussed in the course (e.g., you may choose to compare, contrast, and evaluate two competing theories). If you choose to write a research proposal, it must include an introduction providing the context and rationale for the study, and a methods section (participants, materials, procedures, proposed analyses, and hypothesized results). Your paper must be a maximum of 8 pages (double-spaced, 12-point font, 1-inch margins all around) not including the title page, abstract, or references. The paper must be written in APA format (see Publication Manual of the American Psychological Association, 5th Edition, Washington, DC: American Psychological Association). There will be a penalty for late submissions of 10% per day.

Approximately halfway through the term (see Course Schedule), you must submit a 2-page outline that indicates whether you will write a review or a research proposal, and clearly delineates the structure of your paper. The structure and requirements of your outline will be discussed during class.

Schedule of Readings:

Some of the readings will be mandatory, others will be optional/supplemental, as indicated each week prior to class. The reading list will be modified throughout the term, and additional readings will be added on occasion. See course website for most up-to-date list of readings for each week.

Jan. 8 **Course Overview**

No Readings

Jan. 15 **Approaches & Methods in Memory & Cognitive Research**

Cabeza, R., & Moscovitch, M. (2013). Memory Systems, Processing Modes, and Components: Functional Neuroimaging Evidence. *Perspectives in Psychological Science, 8,* 49-55.

Davis, T., & Poldrack, R.A. (2013). Measuring neural representations with fMRI: practices and pitfalls. *Annals of the New York Academy of Sciences, 1296,* 108-134.

McIntosh, A. R. (2004). Contexts and catalysts: a resolution of the localization and integration of function in the brain. *Neuroinformatics, 2*(2), 175-182.

Rosenbaum, R.S., Köhler, S., Schacter, D. L., Moscovitch, M., Westmacott, R., Black, S.E., Gao, F., & Tulving, E. (2005). The case of K.C.: Contributions of a memory-impaired person to memory theory. *Neuropsychologia, 43,* 989-1021.

Moscovitch, M., Winocur, G., & Behrmann, M. (1997). What Is Special about Face Recognition? Nineteen Experiments on a Person with Visual Object Agnosia and Dyslexia but Normal Face Recognition. *J Cogn Neurosci, 9*(5), 555-604.

Holdstock JS, Parslow DM, Morris RG, Fleminger S, Abrahams S, Denby C, Montaldi D, Mayes AR. (2008). Two case studies illustrating how relatively selective hippocampal lesions in humans can have quite different effects on memory. *Hippocampus, 18,* 679-91.

Jan. 22 **Object Concepts & Semantic Memory**

Martin, A. (2007). The representation of object concepts in the brain. *Annual Review of Psychology, 58,* 25-45.

Patterson, K., Nestor, P. J., & Rogers, T. T. (2007). Where do you know what you know? The representation of semantic knowledge in the human brain. *Nat Rev Neurosci, 8*(12), 976-987.

Martin, A., Simmons, W. K., Beauchamp, M. S., & Gotts, S. J. (2014). Is a single 'hub', with lots of spokes, an accurate description of the neural architecture of action semantics?: Comment on "Action semantics: A unifying conceptual framework for the selective use of multimodal and modality-specific object knowledge" by van Elk, van Schie and Bekkering. *Phys Life Rev*.

Simmons, W. K., & Martin, A. (2009). The anterior temporal lobes and the functional architecture of semantic memory. *J Int Neuropsychol Soc, 15*(5), 645-649.

Simmons, W. K., Reddish, M., Bellgowan, P. S., & Martin, A. (2010). The selectivity and functional connectivity of the anterior temporal lobes. *Cereb Cortex, 20*(4), 813-825.

Jan. 29 **Neurocognitive Specialization & Plasticity**

Dehaene, S., & Cohen, L. (2011). The unique role of the visual word form area in reading. *Trends Cogn Sci, 15*(6), 254-262.

Glezer, L. S., Jiang, X., & Riesenhuber, M. (2009). Evidence for highly selective neuronal tuning to whole words in the "visual word form area". *Neuron, 62*(2), 199-204.

Vogel, A. C., Petersen, S. E., & Schlaggar, B. L. (2014). The VWFA: it's not just for words anymore. *Front Hum Neurosci, 8*, 88.

Glezer, L. S., & Riesenhuber, M. (2013). Individual variability in location impacts orthographic selectivity in the "visual word form area". *J Neurosci, 33*(27), 11221-11226.

Behrmann, M., & Plaut, D. C. (2013). Distributed circuits, not circumscribed centers, mediate visual recognition. *Trends Cogn Sci, 17*(5), 210-219.

Stevens, W. D., & Spreng, R. N. (2014). Resting-state functional connectivity MRI reveals active processes central to cognition. *Wiley International Reviews (WIREs) Cognitive Science* 2013. doi: 10.1002/wcs.1275

Lewis, C. M., Baldassarre, A., Committeri, G., Romani, G. L., & Corbetta, M. (2009). Learning sculpts the spontaneous activity of the resting human brain. *Proc Natl Acad Sci U S A, 106*(41), 17558-17563.

Feb. 5 **Implicit Memory**

Schacter, D. L. (1987). Implicit memory: History and current status. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 13,* 501-518.

Hamann, S. B., & Squire, L. R. (1997). Intact perceptual memory in the absence of conscious memory. *Behav Neurosci, 111*(4), 850-854.

Schacter, D. L., & Buckner, R. L. (1998). Priming and the brain. *Neuron, 20*(2), 185-195.

Schott, B. H., Richardson-Klavehn, A., Henson, R. N., Becker, C., Heinze, H. J., & Duzel, E. (2006). Neuroanatomical dissociation of encoding processes related to priming and explicit memory. *J Neurosci, 26*(3), 792-800.

Schott, B. H., Henson, R. N., Richardson-Klavehn, A., Becker, C., Thoma, V., Heinze, H. J., & Duzel, E. (2005). Redefining implicit and explicit memory: the functional neuroanatomy of priming, remembering, and control of retrieval. *Proc Natl Adac Sci USA, 102*, 1257-1262.

Turk-Browne, N. B., Yi, D. J., & Chun, M. M. (2006). Linking implicit and explicit memory: common encoding factors and shared representations. *Neuron, 49*(6), 917-927.

Feb. 12 **Priming & Repetition Suppression**

Grill-Spector, K., Henson, R., & Martin, A. (2006). Repetition and the brain: neural models of stimulus-specific effects. *Trends Cogn Sci, 10*(1), 14-23.

Schacter, D. L., Wig, G. S., & Stevens, W. D. (2007). Reductions in cortical activity during priming. *Curr Opin Neurobiol, 17*(2), 171-176.

Dobbins, I. G., Schnyer, D. M., Verfaellie, M., & Schacter, D. L. (2004). Cortical activity reductions during repetition priming can result from rapid response learning. *Nature,*

428(6980), 316-319.

Wig, G. S., Grafton, S. T., Demos, K. E., & Kelley, W. M. (2005). Reductions in neural activity underlie behavioral components of repetition priming. *Nat Neurosci, 8*(9), 1228-1233.

Koutstaal, W., Wagner, A. D., Rotte, M., Maril, A., Buckner, R. L., & Schacter, D. L. (2001). Perceptual specificity in visual object priming: functional magnetic resonance imaging evidence for a laterality difference in fusiform cortex. *Neuropsychologia, 39*(2), 184-199.

Feb. 26 **Encoding & Perception**

Craik, F.I. (2002). Levels of processing: past, present, and future? *Memory, 10, 305-318.*

Wagner, A. D. et al. (1998). Building memories: remembering and forgetting of verbal experiences as predicted by brain activity. *Science, 281,* 1188-1191.

Graham, K. S., Barense, M. D., & Lee, A. C. (2010). Going beyond LTM in the MTL: a synthesis of neuropsychological and neuroimaging findings on the role of the medial temporal lobe in memory and perception. *Neuropsychologia, 48*(4), 831-853.

Knutson, A.R., Hopkins, R.O., & Squire, L.R. (2012). Visual discrimination performance, memory, and medial temporal lobe function. *Proc Natl Acad Sci U S A, 109,* 13106-13111.

Erez J, Lee AC, & Barense MD. (2013). It does not look odd to me: perceptual impairments and eye movements in amnesic patients with medial temporal lobe damage. *Neuropsychologia, 51,* 168-180.

Mar. 5 **Retrieval & Distortions**

Eichenbaum, H., Yonelinas, A. P., & Ranganath, C. (2007). The medial temporal lobe and recognition memory. *Annual Review of Neuroscience, 30,* 123–152.

Eldridge, L.L. et al. (2000). Remembering episodes: a selective role for the hippocampus during retrieval. *Nature Neuroscience, 3,* 1149-1152.

Bowles, B., Crupi, C., Mirsattari, S.M., Pigott, S.E., Parrent, A.G., Pruessner, J.C., Yonelinas, A.P. & Kohler, S. (2007). Impaired familiarity with preserved recollection after anterior temporal-lobe resection that spares the hippocampus. *Proceedings of the National Academy of Sciences, USA,* 16382-16387.

Schacter, D. L., Guerin, S. A. & St. Jacques, P. L. (2011). Memory distortion: an adaptive perspective. *Trends in Cognitive Science, 15,* 467 – 474.

Schacter, D. L. (1999). The seven sins of memory. Insights from psychology and cognitive neuroscience. *Am Psychol, 54*(3), 182-203.

Gilboa, A. & Verfaellie, M. (2010). Introduction – Telling it like it isn't: The cognitive neuroscience of confabulation. *Journal of the International Neuropsychological Society, 16,* 961-966.

Mar. 12 **Time & Space: Prospection & Spatial Cognition**

Schacter, D. L., Addis, D. R., Hassabis, D., Martin, V. C., Spreng, R. N., & Szpunar, K.

K. (2012). The future of memory: remembering, imagining, and the brain. *Neuron, 76*(4), 677-694.

Hassabis, D., Kumaran, D., Vann, S. D., & Maguire, E. A. (2007). Patients with hippocampal amnesia cannot imagine new experiences. *Proc Natl Acad Sci U S A, 104*(5), 1726-1731.

Spreng, R. N., Stevens, W. D., Chamberlain, J. P., Gilmore, A. W., & Schacter, D. L. (2010). Default network activity, coupled with the frontoparietal control network, supports goal-directed cognition. *Neuroimage, 53*(1), 303-317.

Epstein, R. A., & Vass, L. K. (2014). Neural systems for landmark-based wayfinding in humans. *Philos Trans R Soc Lond B Biol Sci, 369*(1635), 20120533.

Aminoff, E. M., Kveraga, K., & Bar, M. (2013). The role of the parahippocampal cortex in cognition. *Trends Cogn Sci, 17*(8), 379-390.

Mar. 19 **Executive Functions & Working Memory**

Baddeley, A. (2012). Working memory: theories, models, and controversies. *Annu Rev Psychol, 63*, 1-29.

Champod, A. S., & Petrides, M. (2010). Dissociation within the frontoparietal network in verbal working memory: a parametric functional magnetic resonance imaging study. *J Neurosci, 30*(10), 3849-3856.

Jonides, J., Lewis, R. L., Nee, D. E., Lustig, C. A., Berman, M. G., & Moore, K. S. (2008). The mind and brain of short-term memory. *Annual Review of Psychology, 59,* 193-224.

Race, E., LaRocque, K. F., Keane, M. M., & Verfaellie, M. (2013). Medial temporal lobe contributions to short-term memory for faces. *J Exp Psychol Gen, 142*(4), 1309-1322.

Mar. 26 **Cognitive Neuroscience Lab Tour**

*Readings TBA

Apr. 2 **Neurocognitive Aging**

Buckner, R. L., Head, D., & Lustig, C. (2006). Brain changes in aging: a lifespan perspective. In Bialystok, E., & Craik, F.I.M. (Eds.), *Lifespan cognition: Mechanisms of change.* New York: Oxford University Press.

Turner, G. R., & D'Esposito, M. (2010). Functinoal Neuroimaging in Aging. In Albert, M. L., & Knoefel, J. E. (Eds.), Clinical neurology of aging, third edition. New York: Oxford University Press.

Taylor, M. J. (2006). Neural Bases of Cognitive Development. In Bialystok, E., & Craik, F.I.M. (Eds.), *Lifespan cognition: Mechanisms of change.* New York: Oxford University Press.

Stevens, W. D., Hasher, L., Chiew, K. S., & Grady, C. L. (2008). A neural mechanism underlying memory failure in older adults. *J Neurosci, 28*(48), 12820-12824.

RECOMMENDED TEXTBOOKS (OPTIONAL)

Cognitive Neuroscience:

Banich, M. T., & Compton, R. J. (2011). Cognitive Neuroscience, 3rd edition. Wadsworth, Cengage Learning.

Eichenbaum, H. (2011). The Cognitive Neuroscience of Memory: An Introduction, 2nd edition. New York: Oxford University Press.

Gazzaniga, M.S. (2014). The Cognitive Neurosciences, 4th edition. Cambridge, MA: MIT Press.

Ward, J. (2010). The Student's Guide to Cognitive Neuroscience, 2nd edition. Psychology Press.

Neuroimaging

Rosler, F., Ranganath, C., Roder, B., & Kluwe, R. H. (2009). Neuroimaging of Human Memory: Linking Cognitive Processes to Human Systems. New York: Oxford University Press.

Huettel, S.A., Song, A.W., & McCarthy, G. (2014). Functional Magnetic Resonance Imaging, 3rd edition. Sunderland, MA: Sinauer.

Luck, S.J. & Kappenman, E.S. (2013). *The Oxford Handbook of Event-Related Potential Components.* New York: Oxford University Press.

General Guides to Writing and Presentation

Burchfield, R.W. (2004). Fowler's Modern English Usage.

Kosslyn, S.M. (2006). Graph Design for the Eye and Mind. New York, NY: Oxford University Press.

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

ONLINE RESOURCES

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). This is an excellent website.

Dana Foundation Brain Web: http://www.dana.org/default.aspx (Author: Dana Foundation): provides information and links to validated sites about brain diseases and disorders, as well as webcasts & podcasts.