**University of Alberta, Faculty of Science, DEPARTMENT OF Psychology**

**2020 - 2021 *PSYCO: 371– (Winter Term): Neurobiology of Learning and Memory***

**Time**: *asynchronous* **Place**: *Online* **Course Website***: eClass*

**Instructor:** Claire Scavuzzo **Office**: electronic-on Zoom **E-mail**: [scavuzzo@ualberta.ca](mailto:scavuzzo@ualberta.ca)

TA: Felicitas Kluger Office hours: appointment via **E-mail:** kluger@ualberta.ca

**ELECTRONIC Office Hours**: Thursdays 9AM (ACCESS USING eclass link). Password: psych

**ELECTRONIC OFFICE HOURS PLAN B**: IF CANNOT ACCESS ELECTRONIC OFFICE HOURS PLEASE CONTACT ME BY EMAIL AND I CAN VIRTUALLY CONNECT WITH YOU BY INVITING YOU TO A GOOGLE HANGOUT

**ELECTRONIC OFFICE HOURS PLAN C**: EMAIL ME, WE CAN SET UP ALTERNATIVE TIME FOR VIRTUAL APPOINTMENT

**Course Pre-requisite:** Successful completion of **PSYCO 275** or consent of department

**Free Required Textbook:** Eichenbaum, H (2002). The Cognitive Neuroscience of Memory: An Introduction (2nd Edition), New York, NY: Oxford University Press

\*\*free online versions through UALBERTA library

<https://www-oxfordscholarship-com.login.ezproxy.library.ualberta.ca/view/10.1093/acprof:oso/9780199778614.001.0001/acprof-9780199778614>

**Supplemental Text (Available free online)**: Kessler H., Blackwell S.E., Kehyayan A. (2017) Reconsolidation and Trauma Memory. In: Axmacher N., Rasch B. (eds) Cognitive Neuroscience of Memory Consolidation. Studies in Neuroscience, Psychology and Behavioral Economics. Springer, Cham

<https://search.library.ualberta.ca/catalog/8135679>

<https://link-springer-com.login.ezproxy.library.ualberta.ca/book/10.1007%2F978-3-319-45066-7>

Frontiers young minds, has very digestible concept builders for this course, also free: <https://kids.frontiersin.org/articles?Phrase=memory&SpecialtySlug=>

**Course Description and Objectives**: The aim of this course is to provide an introduction to the neural and cognitive basis of learning and memory. There will be extensive review of the experimental methods used to study cellular mechanisms, cognitive neuroscience, learning and memory systems, and memory consolidation in laboratory animals, non- human primates and humans. This course begins with an introduction to research themes in studying the neurobiology of learning and memory, followed by an in depth review of the cellular and molecular mechanisms involved in learning and memory. Next the course shifts to the cognitive aspects of memory, followed by an in depth look into the multiple memory systems of the brain, the different brain structures that underlie different types of memory. The class ends with discussions of memory consolidation.

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| assessment | * Due Dates | Worth |
| Quizzes | Quizzes open for one week starting on the dates listed below  1: Jan 21  2: Feb 4  3: March 4  4: April 1 | 40%; 4 quizzes @10% each |
| Assignments | 1. Unit reflection discussion posts (3 total @ 5%)   1: February 9: amnesia  2: March 9: cellular molecular  3: April 6: multiple memory systems  Post discussion submission on eclass | 15 % total; 3 @ 5% each reflection post |
| Final Exam | Cumulative, Delivered on eclass, See bear tracks for date | 45% |

**Explanatory Notes:**

Assessments are to be submitted on eClass and will only be accepted within the deadlines indicated on eClass. See syllabus for dates; also verify due date and time indicated on eClass. All exams and quizzes have a single attempt, will be timed and taken online. All will be accessed on eclass. To accommodate time zones, quizzes will be made available for 1 week windows on the dates indicated. Once the quiz/exam is opened you will have a single attempt to complete the assessment within a 30-120 min time limit. Please review instructions on eclass prior to opening to prepare for the time limit. If you open a quiz close to the deadline it will kick you off if the deadline hits before your time limit is up. Be sure to give yourself time to complete the work within the window available. In the event eclass has a problem during a quiz , just hit refresh on the page.

**EXAM**s will consist of multiple choice and true/false questions. The Final Exam is cumulative.

**Quiz :** Questions have matching, multiple choice, true/ false .

**Late/Missing quiz Penalty**: If an quiz is not submitted within eClass dates you will get a zero and the weight will be moved to the final exam. I will defer the weight of **up to** 2 missed quizzes, after missing more than 2 quizzes you will not be able to make up or defer the lost weight, it will just be counted as a zero. *Please do not contact the instructor or TA* for missed quizzes, the weight will be transferred automatically at the end of semester. There will be no make up quizzes. In the case that you have missed a discussion assignment, there will be 10% deduction for each day that a discussion post is late.

**Missed Term Exams:**

For an excused absence where the cause is religious belief, a student must contact the instructor(s) within two weeks of the start of Fall or Winter classes to request accommodation for the term (including the final exam, where relevant). Instructors may request adequate documentation to substantiate the student request.

A student who cannot write a term examination or complete a term assignment due to incapacitating illness, severe domestic affliction or other compelling reasons can apply for a deferral of the weight of the missed term. *FYI: Deferral of term work to exam will increase the weight of the exam for that student, but does not change the ‘syllabus weight’ of the exam and does not qualify a student for re-examination, if the syllabus weight of the final lecture exam was <40%.*

Deferral of term work is a privilege and not a right; there is no guarantee that a deferral will be granted. Misrepresentation of Facts to gain a deferral is a serious breach of the *Code of Student Behaviour*.

**Exams:** Will be delivered online. Will be timed. Will be a mix of multiple choice, true/false, and short answer questions. The final exam is cumulative

**Unit Reflections Discussion Posts**: At the end of each unit we will have a discussion forum to “reflect” on what we have learned that week. The purpose of your reflection post , is to include evidence that you have mastered the knowledge expected of you for that unit.

Use the discussion prompt at the top of each forum: some weeks there will be a general reflection of the textbook/lecture content, or it could be a more specific reflection of recent scientific literature in the field, or evaluation of a case study/ youtube video. The reflections are to be posted by the due date indicated to the forum associated with the unit. Once every 2 weeks we will virtually meet as a class to discuss these reflections (see below).

**Zoom Reflection Discussions at 2pm on discussion due date**: For this I will go through the discussion forum, live and we can discuss a selection of the reflections one-at-a-time. I will ask students directly to elaborate or support their claims made in the discussion forum.

There is no credit associated with this, this is just a chance to “meet” each other and speak on common ground. This is an optional activity to attend. You are encouraged to share what you know, in both the discussion posts and in the virtual meetings. This can be a valuable learning experience for all of us!

**Expectations**: Some notes about online classroom behaviour on virtual discussion boards and meetings that will be considered when formulating assessment criteria. So be mindful of 'netiquette'

* When signing onto an online meeting, IT IS REQUIRED THAT YOU use your REAL full name (first and last) to gain access to the room.
* Just as with *face-to-face* conversations, there are polite and impolite ways to engage in an *online* conversation. For more information about appropriate netiquette, refer to <http://www.albion.com/netiquette/index.html>
  + There is a human being on the other end of the computer. Follow same standards you would in real life
    - Be pleasant.
    - Refrain from use of offensive language towards each other.
    - Do not plagiarize, follow copyright law
    - Cite your source
  + Confrontations should include a logical, evidence- based argument. We can’t always agree, but we can always be constructive when discussing our disagreements.
    - Express yourself freely, but there is No need to hurt people’s feelings
      * Ask yourself if you would say this to this person’s face?
    - Of particular relevance see “avoid flame wars, not flaming” : <http://www.albion.com/netiquette/rule7.html>
  + Respect the time of others, by posting and discussing meaningful relevant content.
    - Please do not post the same thing more than once (please remove if you do so accidentally)
    - Brevity and succinctness in posts is best.
      * We all have a lot of reading online to do. Let’s try not to monopolize the screen and working memory capacity of each other.
  + Don't forget to make yourself look good. Proper spelling and grammar increase your credibility.
    - Make it clear what you are talking about, so it is less easy for your words and ideas to be distorted.
    - Keep your writing simple, and logical, instead of trying to look impressive.
      * Use evidence to support your claims/beliefs/understanding.
    - Proofread before submitting your posts.

**Lecture Schedule:** Lecture materials will be made available by Tuesday at 12 pm each week.

**\*\*\*Lecture Notes Posted on eClass as Google Slides**

**\*\*\* Lecture Recordings posted on eClass as Youtube links (with closed captioning) or Google drive links (for those without YouTube access)**

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| DATE | TOPIC | READING |
| Jan 12 | Syllabus Review  Watch COVID and the brain | This document and eclass |
| Jan 14, 19 | Introduction to research themes | Ch1: <https://www-oxfordscholarship-com.login.ezproxy.library.ualberta.ca/view/10.1093/acprof:oso/9780195141740.001.0001/acprof-9780195141740-chapter-1> |
| Jan 21 | Quiz 1 opens for 1 week | Content from start of course |
| Jan 21, 26, 28, Feb 2 | Amnesia and testing in animal models | Ch4: <https://www-oxfordscholarship-com.login.ezproxy.library.ualberta.ca/view/10.1093/acprof:oso/9780195141740.001.0001/acprof-9780195141740-chapter-4>  Ch5: <https://www-oxfordscholarship-com.login.ezproxy.library.ualberta.ca/view/10.1093/acprof:oso/9780195141740.001.0001/acprof-9780195141740-chapter-5>  Supplemental: <https://link-springer-com.login.ezproxy.library.ualberta.ca/chapter/10.1007/978-3-319-45066-7_24>  <https://link-springer-com.login.ezproxy.library.ualberta.ca/chapter/10.1007/978-3-319-45066-7_4> |
| Feb 4 | Quiz 2 opens for 1 week |  |
| Feb 9 | Discussion post 1 due | Optional zoom call to attend and discuss the post |
| Feb 11, 23, 25, March 2 | Cellular and Molecular bases of memory | Ch2:<https://www-oxfordscholarship-com.login.ezproxy.library.ualberta.ca/view/10.1093/acprof:oso/9780195141740.001.0001/acprof-9780195141740-chapter-2>  Ch3:<https://www-oxfordscholarship-com.login.ezproxy.library.ualberta.ca/view/10.1093/acprof:oso/9780195141740.001.0001/acprof-9780195141740-chapter-3>  Ch6: <https://www-oxfordscholarship-com.login.ezproxy.library.ualberta.ca/view/10.1093/acprof:oso/9780195141740.001.0001/acprof-9780195141740-chapter-6>  Supplemental:  <https://link-springer-com.login.ezproxy.library.ualberta.ca/chapter/10.1007/978-3-319-45066-7_1>  <https://link-springer-com.login.ezproxy.library.ualberta.ca/chapter/10.1007/978-3-319-45066-7_2>  <https://link-springer-com.login.ezproxy.library.ualberta.ca/chapter/10.1007/978-3-319-45066-7_14> |
| March 4 | Quiz 3 opens for 1 week | All content covered since last quiz |
| March 9 | Discussion post 2 due | Optional zoom call to discuss post in depth |
| March 11, 16 | Cortex and memory  Multiple memory systems in the brain | Ch7 :<https://www-oxfordscholarship-com.login.ezproxy.library.ualberta.ca/view/10.1093/acprof:oso/9780199778614.001.0001/acprof-9780199778614-chapter-7>  Ch8: <https://www-oxfordscholarship-com.login.ezproxy.library.ualberta.ca/view/10.1093/acprof:oso/9780199778614.001.0001/acprof-9780199778614-chapter-8>  Supplemental: <https://link-springer-com.login.ezproxy.library.ualberta.ca/chapter/10.1007/978-3-319-45066-7_7> |
| March 18, 23 | A brain system for declarative memory | Ch 9: <https://www-oxfordscholarship-com.login.ezproxy.library.ualberta.ca/view/10.1093/acprof:oso/9780199778614.001.0001/acprof-9780199778614-chapter-9>  Supplemental: <https://link-springer-com.login.ezproxy.library.ualberta.ca/chapter/10.1007/978-3-319-45066-7_3> |
| March 25 | A brain system for procedural memory | Ch 10: <https://www-oxfordscholarship-com.login.ezproxy.library.ualberta.ca/view/10.1093/acprof:oso/9780199778614.001.0001/acprof-9780199778614-chapter-10> |
| March 30 | A brain system for emotional memory | Ch 11: <https://www-oxfordscholarship-com.login.ezproxy.library.ualberta.ca/view/10.1093/acprof:oso/9780199778614.001.0001/acprof-9780199778614-chapter-11>  Supplemental: <https://link-springer-com.login.ezproxy.library.ualberta.ca/chapter/10.1007/978-3-319-45066-7_17>  <https://link-springer-com.login.ezproxy.library.ualberta.ca/chapter/10.1007/978-3-319-45066-7_22> |
| April 1 | Quiz 4 opens for 1 week | Content since last quiz |
| April 6 | Discussion 3 post due | Optional zoom call to discuss post in depth |
| April 8, 13, 15 | 2 stages of memory consolidation: | Ch 12: <https://www-oxfordscholarship-com.login.ezproxy.library.ualberta.ca/view/10.1093/acprof:oso/9780199778614.001.0001/acprof-9780199778614-chapter-12>  Supplemental:  <https://link-springer-com.login.ezproxy.library.ualberta.ca/chapter/10.1007/978-3-319-45066-7_16>  <https://link-springer-com.login.ezproxy.library.ualberta.ca/chapter/10.1007/978-3-319-45066-7_15> |
| April 15 | TA guest lecture |  |
| TBA | Final Exam | cumulative |

**Past or Representative Evaluative Course Material will be made available** for sample test questions within 1 week of exam dates and posted to eClass.SEE ECLASS UNDER THE “EXAM TOPIC” TO FIND PRACTICE EXAMS, THAT ARE USING THE SAME REMOTE TESTING DELIVERY SYSTEM AS YOUR MIDTERM AND FINAL.

**Technology for Remote Learning:**

To successfully participate in remote learning in this course, it is recommended that students have access to a computer with an internet connection that can support the tools and technologies the University uses to deliver content, engage with instructors, TAs, and fellow students, and facilitate assessment and examinations. Please refer to [Technology for Remote Learning - For Students](https://www.ualberta.ca/campus-life/technology-requirements.html) for details. If you encounter difficulty meeting the technology recommendations, please email the Dean of Students Office (dosdean@ualberta.ca) directly to explore options and support.

Please contact the instructor by the add/drop deadline January 15, 2021 if you do not have access to the minimum technology recommended. The instructor will make arrangements for accommodating students who contact the instructor before this date. Failure to do so may result in a zero in any assessment that depends on the minimum technology.

**Student Resources for Remote Learning:**

Online learning may be new to you. Check out tips for success and find out more about online learning on the Campus Life page, and specifically on the Student Resources for Remote Learning page.

**Policy about course outlines can be found in the “**[**Evaluation Procedures and Grading System**](http://calendar.ualberta.ca/content.php?catoid=20&navoid=4939)**” section of the University Calendar.**

**COVID-19 Updates:** Updates pertaining to university-related activities can be found on the [COVID-19 Information website](https://www.ualberta.ca/covid-19/index.html).

**Policy about course outlines can be found in the “**[**Evaluation Procedures and Grading System**](http://calendar.ualberta.ca/content.php?catoid=20&navoid=4939)**” section of the University Calendar.**

**Academic Integrity and Honesty**

“The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at [www.governance.ualberta.ca](http://www.governance.ualberta.ca/en/CodesofConductandResidenceCommunityStandards/CodeofStudentBehaviour.aspx)) and avoid any behaviour that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.”

**All students** should consult the information provided by the [Student Conduct & Accountability Office](http://www.osja.ualberta.ca/) regarding avoiding cheating and plagiarism in particular and academic dishonesty in general (see the [Academic Integrity Undergraduate Handbook](http://www.deanofstudents.ualberta.ca/en/AcademicIntegrity/UndergraduateHandbook.aspx) and [Information for Students](http://www.deanofstudents.ualberta.ca/en/AcademicIntegrity.aspx)). If in doubt about what is permitted in this class, ask the instructor.

The [Code of Student Behaviour](http://www.governance.ualberta.ca/CodesofConductandResidenceCommunityStandards/CodeofStudentBehaviour.aspx) should be reviewed since ignorance is not acceptable as a defence in cases of academic offences. Students should be informed that when cheating and/or plagiarism has been determined to have occurred, a number of sanctions can be imposed, such as lowering a grade or expulsion from the University (outlined in [Section 30.4.2](http://www.governance.ualberta.ca/en/CodesofConductandResidenceCommunityStandards/CodeofStudentBehaviour/304SanctionsandTheirImpact/3042TypesofSanctions.aspx) of the Code).

All forms of dishonesty are unacceptable at the University. Any offence will be reported to the Associate Dean of Science who will determine the disciplinary action to be taken. Cheating, plagiarism and misrepresentation of facts are serious offences. Anyone who engages in these practices will receive at minimum a grade of zero for the exam or paper in question and no opportunity will be given to replace the grade or redistribute the weights. As well, in the Faculty of Science the sanction for **cheating** on any examination will include **a disciplinary failing grade** (NO EXCEPTIONS) and senior students should expect a period of suspension or expulsion from the University of Alberta*.*

**Recording of Lectures:**

Audio or video recording, digital or otherwise, of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s).

**Attendance(THERE IS NO REQUIREMENT TO ATTEND CAMPUS FOR THE PURPOSES OF THIS COURSE) , Absences, and Missed Grade Components**:

Lectures for the week will be released by Tuesdays at 12 pm. Regular attendance is essential for optimal performance in any course. Luckily this class is taught remotely. Try to set aside time 2ce a week to go through each lecture for the week, this class was set originally for Tuesday and Thursday afternoons, try to make time for this course, so you don’t fall behind.

In cases of potentially excusable absences due to illness or domestic affliction, notify your instructor by e-mail within two days. Regarding absences that may be excusable and procedures for addressing course components missed as a result, consult the Calendar regarding [Attendance](http://calendar.ualberta.ca/content.php?catoid=20&navoid=4939#Attendance) and [Examinations](http://calendar.ualberta.ca/content.php?catoid=20&navoid=4939#Examinations_(Exams)) sections of the University Calendar. Be aware that unexcused absences will result in partial or total grade deductions for any assignments that are not handed-in or completed as a result.

See [*Calendar*, Attendance](http://calendar.ualberta.ca/content.php?catoid=20&navoid=4939#Attendance). Students may miss a term exam, or an assignment deadline for a number of reasons. Acceptable reasons include incapacitating illness, severe domestic affliction, or religious reasons. Excused absences are not granted automatically. Approval for an excused absence from term work . . . or term exams is at the discretion of the instructor.

Students must apply to the instructor within two working days of the absence (or as soon as possible with due regard for the circumstances). Refer to “Missed assignments” and “missed exam” sections above for information on how to replace the missing work/exam score.

Students are no longer required to present medical documentation to support absence due to illness **and cannot be asked to do so**. Students may present a [*Medical Declaration Form* *for Students*](https://cloudfront.ualberta.ca/-/media/arts/student-services/documents/2016-forms/medical-declaration-form-for-students-feb-2016-rac.pdf) in lieu. If the absence is for non-medical reasons, appropriate documentation can be requested (e.g. police report regarding a crime; a Court Attendance form for jury duty; death certificate or obituary for bereavement).

**Deferred Final Examination (if applicable):**

Deferred Final Exams will be retaken within 3 days of the scheduled final exam

Date or approval from the faculty. No exceptions.

A student who cannot write the final examination due to incapacitating illness, severe domestic affliction or other compelling reasons can apply for a deferred final examination. Students who failed at the start of term to request exam accommodations for religious beliefs are expected to follow the normal deferred final examination process. Such an application must be made to the student’s Faculty office within two working days of the missed examination and must be supported by appropriate documentation or a Statutory Declaration (<http://calendar.ualberta.ca/content.php?catoid=20&navoid=4939#Attendance>). Deferred examinations are a privilege and not a right; there is no guarantee that a deferred examination will be granted. Misrepresentation of Facts to gain a deferred examination is a serious breach of the *Code of Student Behaviour*.

**STUDENTS ELIGIBLE FOR ACCESSIBILITY-RELATED ACCOMMODATIONS (students registered with Student Accessibility Services - SAS):** Eligible students have both rights and responsibilities with regard to accessibility-related accommodations. Consequently, scheduling ​exam accommodations in accordance with SAS deadlines and procedures is essential. Please note adherence ​to procedures and deadlines​ is required for U of A to provide accommodations. Contact SAS ([www.ssds.ualberta.ca](http://www.ssds.ualberta.ca/)) for further information. All quizzes and exams are designed to take an allotted period of time (see individual instructions on eclass). All quizzes and exams are provided a 2x time multiplier for all students. If a student requires time extensions or accommodations in addition to the 2x time multiplier please contact the instructor to ensure you are accommodated.

**STUDENT SUCCESS CENTRE**: Students who require additional help in developing strategies for better time management, study skills or examination skills should contact the Student Success Centre (2-300 Students’ Union Building).

**Withdrawal from Classes**

Students may withdraw from classes after the add/drop deadlines have passed. The 2017-18 deadlines for Withdrawal are:

·May 7?/ 11?, 2020 (fee repayment)

May 19, 2020 (50% fee repayment)

June 3, 2020 receive a grade of W

**Grade Evaluation**:

Marks for assignments, tests, and exams are given in percentages, to which letter grades are also assigned, according to the table below. The percentage mark resulting from the entire term work and examination then produces the final letter grade for the course.

\*\*There will be no rounding up of percentage grades. Letter grades are non negotiable.

\*\*If students see a problem in the grading of their assessment, they must contact the TA (in case of assignments) or instructor (in case of quizzes and exam) within 2 weeks of their grade being released. Last minute (i.e. end of semester) attempts for grade changes cannot be expected to be argued after 2 weeks of receiving the grade.

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| Letter | % | Pts |
| A+ | 97-100+ | 4.0 |
| A | 92-96.99 | 4.0 |
| A- | 87-91.99 | 3.7 |
| B+ | 82-86.99 | 3.3 |
| B | 77-81.99 | 3.0 |
| B- | 72-76.99 | 2.7 |
| C+ | 67-71.99 | 2.3 |
| C | 62-66.99 | 2.0 |
| C- | 57-61.99 | 1.7 |
| D+ | 52-56.99 | 1.3 |
| D | 50-51.99 | 1.0 |
| F | <49.99 | 0.0 |

Instructors will mark, provide appropriate feedback, and return to students all term work in a timely manner. See the University of Alberta [Assessment and Grading Policy](https://policiesonline.ualberta.ca/PoliciesProcedures/Pages/DispPol.aspx?PID=101).

**Disclaimer:** Any typographical errors in this Course Outline are subject to change and will be announced in class. The date of the final examination is set by the Registrar and takes precedence over the final examination date reported in this syllabus.