Psychology 351C (A01) – Cognitive Neuroscience – Fall 2021

Course Outline

**Time:** Monday & Thursday, 11:30am – 12:50pm  
**Location:** ECS 116  
**Website:** Brightspace

**Instructor:** Prof. Adam Krawitz  
**Email:** akrawitz@uvic.ca  
**Office:** Cornett A251  
**Office Hours:** TBA on Brightspace

**Teaching Assistant:** Josh Palmer  
**Email:** jmpalmer@uvic.ca  
**Office:** Cornett B327  
**Office Hours:** TBA on Brightspace

**Course Inspiration & Goals**

“The mind is what the brain does.”

*Steven Pinker, p. 21, How the Mind Works, 1997.*

My primary goals for this course are for you to:

- Improve your knowledge of the field of cognitive neuroscience.
- Develop your ability to critically read and evaluate research about the mind and brain.
- Gain a deeper understanding of the methods of cognitive neuroscience.
- Increase your appreciation for how cognitive neuroscience is applicable to everyday life.

**Territory Acknowledgement**

We acknowledge and respect the lək̓əwəŋən peoples on whose traditional territory the university stands and the Songhees, Esquimalt and WSÁNEĆ peoples whose historical relationships with the land continue to this day.

**Respect for Diversity**

I intend that students from all backgrounds and perspectives be well-served by this course, that students’ learning needs be addressed both in and out of class, and that students’ diversity be viewed as a resource, strength, and benefit. I intend to present materials and activities that are respectful of diversity, including gender, sexuality, disability, age, socio-economic status, ethnicity, race, and culture. Please suggest ways to improve the effectiveness of this course for you and your fellow students. In addition, if any of our class meetings conflict with your religious events, please let me know so that we can make arrangements for you.

**Prerequisites & Registration**

Prerequisites for this course are: PSYC 201 and PSYC 251.

Students are responsible for checking their own registration status. Students will not be added to the course after the Add Deadline on September 25. Students may not be automatically dropped for non-attendance, so students deciding to drop the course must do so themselves. The Drop Deadline with 100% fee reduction is September 24, with 50% fee reduction is October 12, and without penalty of failure is October 31. Refer to the UVic Calendar for further dates: [https://web.uvic.ca/calendar/dates/](https://web.uvic.ca/calendar/dates/)

**Required Materials**

**Hardware/App/Web:** iClicker/iClicker 2/iClicker+ remote, or iClicker Student Mobile/Web App

For sale at the UVic Bookstore and online: [https://www.iclicker.com/students](https://www.iclicker.com/students)

Register your iClicker through UVic Online Tools: [https://www.uvic.ca/tools/student/tools-forms/iclicker/](https://www.uvic.ca/tools/student/tools-forms/iclicker/)

**Assigned Readings:** Journal articles and book chapters.

Available as PDFs on Brightspace: [https://bright.uvic.ca/d2l/home/148312](https://bright.uvic.ca/d2l/home/148312)

**Optional Materials**


At UVic Bookstore and online at: [https://wwnorton.com/books/9780393603170](https://wwnorton.com/books/9780393603170)
Grades
Your final letter grade in the course will be determined by your total percent score according to the standard UVic grading scale (https://www.uvic.ca/calendar/undergrad/index.php#/policy/S1AagoGuV). Final grades with a decimal point of 0.5 or above will be rounded to the next higher whole number, and grades with a decimal point below 0.5 will be rounded to the next lower whole number. The minimum percentage necessary for each grade is as follows:

<table>
<thead>
<tr>
<th>Letter grade</th>
<th>Minimum %</th>
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<tbody>
<tr>
<td>A+</td>
<td>90</td>
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<tr>
<td>A</td>
<td>85</td>
</tr>
<tr>
<td>A-</td>
<td>80</td>
</tr>
<tr>
<td>B+</td>
<td>77</td>
</tr>
<tr>
<td>B</td>
<td>73</td>
</tr>
<tr>
<td>B-</td>
<td>70</td>
</tr>
<tr>
<td>C+</td>
<td>65</td>
</tr>
<tr>
<td>C</td>
<td>60</td>
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<tr>
<td>D</td>
<td>50</td>
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Evaluation
Your grade will be based on the following items:

<table>
<thead>
<tr>
<th>Item</th>
<th>Date</th>
<th>% of Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>iClicker Participation</td>
<td>throughout</td>
<td>5 (or 0)</td>
</tr>
<tr>
<td>Homework Assignments</td>
<td>throughout</td>
<td>20 (or 25)</td>
</tr>
<tr>
<td>Exam 1</td>
<td>Mon., Oct. 18</td>
<td>25</td>
</tr>
<tr>
<td>Exam 2</td>
<td>Mon., Nov. 15</td>
<td>25</td>
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<tr>
<td>Exam 3</td>
<td>(Exam Period)</td>
<td>25</td>
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<tr>
<td>Extra Credit</td>
<td>by Mon., Dec. 6</td>
<td>(up to 2)</td>
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The exams are required course components. Failure to complete all 3 exams will result in an N grade.

iClicker Participation (5% or 0%): The use of iClickers will give you opportunities to participate in class and compare your thoughts with those of other students, and provide me with feedback on your level of understanding. You will not be evaluated on the answers you give, just on participation.

iClicker participation credit for a class is earned by making at least one iClicker response that day. Credit will be given for each class, except for the first class and exam days, thus there are 20 available classes. You can miss iClicker participation in up to 4 classes and still receive full credit. If you miss participation in more than 4 classes, your grade will be based on the number of days you participated divided by 16.

Note: The 5% for iClicker Participation may alternatively be determined by your Lab Activities. This option will be automatically invoked if it will benefit your final course mark. While I strongly believe you will get the most out of the course if you attend and participate in class, this option allows for flexibility if you cannot or choose not to attend.

Homework Assignments (20% or 25%): For each topic, a homework assignment will give you hands-on experience and active engagement with the material. Credit will be divided evenly over the 7 assignments. Detailed instructions on how to access and complete the assignments will be provided on Brightspace.

Exams (75%): Exams will evaluate your understanding of the material presented in the assigned articles, the lectures, and the homework assignments. Exams will include multiple choice and short answer questions on the following topics:

- Exam 1: TMS & Perception and ERPs & Attention
- Exam 2: Single-Unit Recording & Action and Neural Networks & Cognitive Control
- Exam 3: fMRI & Long-Term Memory, Lesions & Language, Converging Methods & Decision Making

The first 2 exams will be during class, while Exam 3 will be during the examination period. You are responsible for taking examinations as scheduled. This responsibility includes Exam 3, so DO NOT plan your travel until the exam schedule is finalized. If you miss an exam for a valid reason (e.g. illness or accident) you may be permitted to take a make-up test at the instructor’s discretion. Unexcused missed examinations will be assigned a score of zero. If you will need time beyond the end of the term, you must apply to the Office of the Registrar to request a deferral (see the UVic Calendar for guidelines: https://www.uvic.ca/calendar/undergrad/index.php#/policy/HjAxigO4).
Extra Credit (up to 2%):

Research Participation: Experience research being carried out here at UVic, while simultaneously helping out our scientific community with data collection. Earn up to 2% toward your final grade by participating in research studies in the Department of Psychology. Each 15 minutes of participation will earn 0.25 credits and up to 2 credits may be counted toward this course. Each credit increases your final grade by 1%, thus 2 hours (i.e. 2 credits) of participation will earn the full 2%. For details, go to the Psychology Research Participation System web page (https://www.uvic.ca/socialsciences/psychology/research/participants) and follow the instructions for students. You are encouraged, but not required, to participate in studies pertaining to this class. The last day for earning and assigning credits towards this course is Monday, December 6.

Alternative Activity (article reviews): If you want to earn extra credit, but do not wish to be a research participant, article reviews are an alternative. You will gain research experience by writing reviews of recent journal articles about original research relevant to the course. Each review will be worth 1% extra credit and a maximum of 2 reviews will be accepted (i.e. you can earn a total of 2% extra credit). You must send an email to the TA no later than Monday, November 29 indicating you wish to use this option, and submitting the chosen journal article(s) for approval. Completed reviews must be submitted via Brightspace no later than Monday, December 6. Details and requirements are on Brightspace.

Note: You can combine Research Participation and an Article Review, but the total cannot exceed 2%.

Course Experience Survey (CES)

Near the end of the term, you will receive an email inviting you to complete the CES online. Please complete the CES in class on Monday, December 6. I will set aside ~15 minutes at the beginning of class. We do the CES in class because this increases the number of students who complete it. You will need your UVic Netlink ID and a laptop, tablet, or mobile device. If you do not own one, then please try to borrow one for that class. If you don’t complete the CES during class, you can complete it at any time during the last week of classes.

I value your feedback on this course! The more students that complete the survey, the more meaningful and informative the results will be. The CES provides vital information that I will use to improve this course in the future. It will also be used by the Department of Psychology to evaluate my performance as an instructor. I will not receive the results until after I have submitted marks for this course. Responses are anonymous unless you choose to say things in optional open-ended comments that identify you.

Tips for Success

Please consider the following suggestions for maximizing success:

- Take care of yourself and do your best to maintain a healthy lifestyle by eating well, exercising, getting enough sleep and taking some time to relax.
- Attend, participate, and engage in class.
- Use the posted lecture slides and class recordings for note-taking, reference, and studying.
- Read the assigned articles and chapters to augment the lecture material.
- Do the homework assignments, and make sure you understand how to arrive at the correct answers.
- When you are studying, don’t just reread, actively self-test.
- Focus not just on facts, but also on concepts, methods, and relationships between ideas.
- Don’t cram, rather, spread out you study time over days and weeks.
- Organize a study group using the Student Discussion Forum on Brightspace.
- If you struggle in the course, seek help sooner rather than later – we want you to succeed!
Sources of Assistance
Please make use of the following resources as needed:

Course Material: Do you have questions about course material? Or do you just want to chat about the course? Please feel free to contact Prof. Krawitz or the TA during office hours or by email.

Course Marks: Do you have questions about the marking of an exam or lab activity? First, review the course material, including the answer key (if applicable), to determine the explanation yourself. Second, if you still have questions, visit the TA during office hours. Third, if talking to the TA does not resolve the issue, visit Prof. Krawitz during office hours.

Brightspace, Echo360, etc…: For issues using Brightspace, Echo360, or other online tools, visit UVic’s Learn Anywhere site: https://onlineacademiccommunity.uvic.ca/learnanywhere/

Email, Netlink ID, Lab Computers: For technical matters, please contact the Computer Help Desk: helpdesk@uvic.ca, (250) 721-7687, Clearihue A004, or visit the University Systems Help Centre: https://www.uvic.ca/systems/support/

Psychology Research Participation System: Email the coordinator: p100res@uvic.ca, or refer to the documentation at: https://www.uvic.ca/socialsciences/psychology/research/participants/

Reading & Writing: For help with academic reading and writing, contact the Centre for Academic Communication: https://www.uvic.ca/learningandteaching/cac/

Learning Assistance Program: Are you struggling with understanding course material or finding effective study methods? You may want to consult with the tutors and learning strategists at the Learning Assistance Program (fees may apply): https://onlineacademiccommunity.uvic.ca/lap/

Academic Accommodation: Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodation, please feel free to approach me and/or the Resource Centre for Students with a Disability (RCSD) as soon as possible. The RCSD staff members are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations: https://www.uvic.ca/services/cal/

English as an Additional Language: If English is not your first language and you are having trouble because of that, please contact the English Language Centre: https://continuingstudies.uvic.ca/elc

Counselling Services: Counselling Services can help you make the most of your university experience. They offer free professional, confidential, inclusive support to currently registered UVic students. https://www.uvic.ca/services/counselling/

Elders’ Voices: The Office of Indigenous Academic and Community Engagement (IACE) has the privilege of assembling Elders from local communities to guide students, staff, faculty and administration in Indigenous ways of knowing and being: https://www.uvic.ca/services/indigenous/students/programming/elders/

Mental Health and Well-being: Most students at one time or another struggle with mental health issues (anxiety, depression, insomnia, substance abuse, etc.). UVic has a wealth of resources to help students through those tough times: https://www.uvic.ca/mentalhealth/

Notice & Disclaimer
Students are expected to familiarize themselves with the Department of Psychology Important Course Policy Information (attached).

All information in this Course Outline is subject to change in the event of extenuating circumstances.


<table>
<thead>
<tr>
<th>Topic</th>
<th>Date</th>
<th>Reading</th>
<th>Optional Textbook Reading</th>
<th>Homework*</th>
</tr>
</thead>
<tbody>
<tr>
<td>0. Course Introduction</td>
<td>Thu., Sept. 9</td>
<td>Posner &amp; DiGirolamo (2000)</td>
<td>Ch. 1</td>
<td></td>
</tr>
<tr>
<td>1. TMS &amp; Perception</td>
<td>Mon., Sept. 13</td>
<td>Hallett (2007)</td>
<td>Ch. 3 (pp. 88-89) &amp; Ch. 5</td>
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<td>Thu., Sept. 16</td>
<td>Walsh &amp; Cowey (1998)</td>
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<td>Mon., Sept. 20</td>
<td>Pascual-Leone &amp; Walsh (2001)</td>
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<tr>
<td>2. ERPs &amp; Attention</td>
<td>Thu., Sept. 23</td>
<td>Luck (2012)</td>
<td></td>
<td>HW 1 Due</td>
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<td>Mon., Sept. 27</td>
<td>Luck, Woodman, &amp; Vogel (2000)</td>
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<td></td>
<td>(Thu., Sep. 30)</td>
<td>National Day for Truth and Reconciliation – No Class</td>
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<td></td>
<td>Mon., Oct. 4</td>
<td>Luck, Vogel, &amp; Shapiro (1996)</td>
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<td>3. Single-Unit Recording &amp; Action</td>
<td>Thu., Oct. 7</td>
<td>Buzsáki (2004)</td>
<td>Ch. 3 (pp. 95-98) &amp; Ch. 8</td>
<td>HW 2 Due</td>
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<td></td>
<td>(Mon., Oct. 11)</td>
<td>Thanksgiving Day – No Class</td>
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<tr>
<td>Exam 1</td>
<td>Mon., Oct. 18</td>
<td>(Topics 1 &amp; 2)</td>
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<td>Thu., Oct. 21</td>
<td>Georgopoulos et al. (1989)</td>
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<td>4. Neural Networks &amp; Cognitive Control</td>
<td>Mon., Oct. 25</td>
<td>Lewandowsky &amp; Farrell (2010), Hinton (1992)</td>
<td>Ch. 3 (pp. 111-114) &amp; Ch. 12</td>
<td>HW 3 Due</td>
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<td>Thu., Oct. 28</td>
<td>Botvinick &amp; Cohen (2014)</td>
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<td>Mon., Nov. 1</td>
<td>Braver, Barch, &amp; Cohen (1999)</td>
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<td>5. fMRI &amp; Long-Term Memory</td>
<td>Thu., Nov. 4</td>
<td>Wittmann &amp; D’Esposito (2012)</td>
<td>Ch. 3 (pp. 107–110) &amp; Ch. 9</td>
<td>HW 4 Due</td>
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<td></td>
<td>Mon., Nov. 8</td>
<td>Henson (2005)</td>
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<td></td>
<td>(Thu., Nov. 11)</td>
<td>Reading Break – No Class</td>
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<tr>
<td>Exam 2</td>
<td>Mon., Nov. 15</td>
<td>(Topics 3 &amp; 4)</td>
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<td></td>
<td>Thu., Nov. 18</td>
<td>Cabeza et al. (2001)</td>
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<td>6. Lesions &amp; Language</td>
<td>Mon., Nov. 22</td>
<td>Rorden &amp; Karnath (2004)</td>
<td>Ch. 3 (pp. 78–86) &amp; Ch. 11</td>
<td>HW 5 Due</td>
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<td>Thu., Nov. 25</td>
<td>Hillis (2007)</td>
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<td></td>
<td>Mon., Nov. 29</td>
<td>Dronkers (1996)</td>
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<td>7. Converging Methods &amp; Decision Making</td>
<td>Thu., Dec. 2</td>
<td>Bechtel (2002)</td>
<td>Ch. 3 (pp. 114-117) &amp; Ch. 12</td>
<td>HW 6 Due</td>
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<tr>
<td></td>
<td>Mon., Dec. 6</td>
<td>Platt &amp; Huettel (2008), Knoch et al. (2006)</td>
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* Homework Activities are due at 11:59 pm on the due date.
Prerequisites

Students who remain in courses for which they do not have the prerequisites do so at their own risk. Students who complete courses without prerequisites ARE NOT exempt from having to complete the prerequisite course(s) if such courses are required for the degree program.

Program Requirements

For more information see the UVic Calendar September 2021.

Registration Status

Students are responsible for verifying their registration status. Registration status may be verified using My Page, View Schedule. Course adds and drops will not be processed after the deadlines set out in the current UVic Calendar.

Commitment to Inclusivity and Diversity

The University of Victoria is committed to promoting, providing and protecting a positive and supportive and safe learning and working environment for all its members.

In the Event of Illness, Accident or Family Affliction

- What to do if you miss the final exam scheduled during the formal exam period

Apply at Records Services for a “Request for Academic Concession”, normally within 10 working days of the date of the exam. Records Services will forward the form to the instructor. If the concession is granted, the instructor will determine how to deal with the situation (for example, a deferred exam). Where a concession is not applied for or where such application is denied, an N grade will be entered on the student’s academic record.

OR, you can download the Request for Academic Concession form here: http://www.uvic.ca/registrar/assets/docs/record-forms/rac.pdf

- What to do if you miss an exam other than one scheduled during the formal exam period

Do not apply at Records Services for a “Request for Academic Concession”. Instead submit documentation of the illness, accident or family affliction directly to your course instructor (or designated teaching assistant).

- What to do if you require additional time to complete course requirements

Apply at Records Services for a “Request for Academic Concession”, normally within 10 working days of the end of the course. Records Services will forward the form to the instructor. If the concession is granted, the instructor will determine how to deal with the situation (for example, a deferred exam). Where a concession is not applied for or where such application is denied, an N grade will be entered on the student’s academic record.

OR, you can download the Request for Academic Concession form here: http://www.uvic.ca/registrar/assets/docs/record-forms/rac.pdf
Policy on Academic Integrity including Plagiarism and Cheating

The Department of Psychology fully endorses and intends to enforce rigorously the Senate Policy on Academic Integrity. It is of utmost importance that students who do their work honestly be protected from those who do not. Because this policy is in place to ensure that students carry out and benefit from the learning activities assigned in each course, it is expected that students will cooperate in its implementation.

The offences defined by the policy can be summarized briefly as follows:

1. **Plagiarism.** You must make sure that the work you submit is your work and not someone else's. There are proper procedures for citing the works of others. The student is responsible for being aware of and using these procedures.

2. **Unauthorized Use of an Editor.** The use of an editor is prohibited unless the instructor grants explicit written authorization.

3. **Multiple Submission.** Only under exceptional circumstances may a work submitted to fulfill an academic requirement be used to satisfy another similar requirement. The student is responsible for clarifying this with the instructor(s) involved.

4. **Falsifying Materials Subject to Academic Evaluation.** This includes falsification of data, use of commercially prepared essays, using information from the Internet without proper citation, citing sources from which material is not actually obtained, etc.

5. **Cheating on Assignments, Tests, and Examinations.** You may not copy the work of others in or out of class; you may not give your work to others for the purpose of copying; you may not use unauthorized material or equipment during examinations or tests; and you may not impersonate or allow yourself to be impersonated by another at an examination. The Department of Psychology has a policy of not making old examinations available for study purposes. Therefore, use of old exams without the express written permission of the instructor constitutes cheating by the user, and abetting of cheating by the person who provided the exam.

6. **Aiding Others to Cheat.** It is a violation to help others or attempt to help others to engage in any of the conduct described above.

Instructors are expected to make every effort to prevent cheating and plagiarism. This may include the assignment of seating for examinations, asking students to move during examinations, requests to see student identification cards, and other measures as appropriate. Instructors also have available to them a variety of tools and procedures to check for Internet and electronic media-based cheating. In instances of suspected or actual plagiarism or cheating, instructors, following prescribed procedures, are authorized to take steps consistent with the degree of the offence. These measures will range from a zero on the test or assignment or a failing grade for the course, probation within a program to temporary or even permanent suspension from the University.

Rights of Appeal are described in the Policy on Academic Integrity in the University calendar September 2021.

The definitive source for information on Academic Integrity is the University Calendar. Other useful resources on Plagiarism and Cheating include:

1. The Ombudsperson's office: [https://uvicombudsperson.ca/tips/plagiarism/](https://uvicombudsperson.ca/tips/plagiarism/)
   The Office of the Ombudsperson is an independent and impartial resource to assist with the fair resolution of student issues. A confidential consultation can help you understand your rights and responsibilities. The Ombudsperson can also clarify information, help navigate procedures, assist with problem-solving, facilitate communication, provide feedback on an appeal, investigate and make recommendations. Phone: 250-721-8357; Email: ombuddy@uvic.ca; Web: uvicombudsperson.ca.


BE WELL

A note to remind you to take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle. You are not alone.

Social Life, Friends, & Community at UVic:
Having a social network is an extremely important foundation for positive mental health. There are lots of benefits to joining clubs, course unions, intramurals and teams on campus.
https://www.uvic.ca/mentalhealth/undergraduate/connecting/index.php

Counselling Services:
Counselling Services can help you make the most of your university experience. They offer free professional, confidential, inclusive support to currently registered UVic students. www.uvic.ca/services/counselling/

Health Services:
University Health Services (UHS) provides a full service primary health clinic for students, and coordinates healthy student and campus initiatives.
www.uvic.ca/services/health/

Centre for Accessible Learning:
The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations www.uvic.ca/services/cal/. The sooner you let us know your needs, the quicker we can assist you in achieving your learning goals in this course.

Elders' Voices:
The Office of Indigenous Academic and Community Engagement (IACE) has the privilege of assembling a group of Elders from local communities to guide students, staff, faculty and administration in Indigenous ways of knowing and being.
www.uvic.ca/services/indigenous/students/programming/elders/

Mental Health Supports and Services:
mMental health supports and services are available to students from all areas of the UVic community: www.uvic.ca/mentalhealth/undergraduate/
Sexualized Violence Prevention and Response at UVic

UVic takes sexualized violence seriously, and has raised the bar for what is considered acceptable behaviour. We encourage students to learn more about how the university defines sexualized violence and its overall approach by visiting www.uvic.ca/svp. If you or someone you know has been impacted by sexualized violence and needs information, advice, and/or support please contact the sexualized violence resource office in Equity and Human Rights (EQHR). Whether or not you have been directly impacted, if you want to take part in the important prevention work taking place on campus, you can also reach out:

Where: Sexualized violence resource office in EQHR, Sedgewick C119

Phone: 250.721.8021

Email: svpcoordinator@uvic.ca

Web: www.uvic.ca/svp