



**CUMMING SCHOOL OF MEDICINE  
GRADUATE COURSE OUTLINE**

<b>COURSE TITLE: Systems Neuroscience</b>			
<b>Course</b>	MDSC 619.02		
<b>Pre/Co-Requisites</b>	<p>Sufficient background in biological sciences, physical sciences, and neuroscience to qualify for admission to the Graduate Program in Neuroscience. It will be helpful, but not formally required, to take MDSC 619.01 (Neuro I) before taking this course. Preference is given to graduate students registered in Neuroscience (MDNS). Consent of a Course Coordinator is required for all other students.</p> <p>Note: Not open to undergraduate students.</p>		
<b>Faculty</b>	Cumming School of Medicine, Graduate Science Education		
<b>Instructor Name(s)</b>	Dr. Jonathan Epp and Dr. Alexander Lohman	<b>Email</b>	<a href="mailto:Jonathan.epp1@ucalgary.ca">Jonathan.epp1@ucalgary.ca</a> <a href="mailto:Alex.lohman@ucalgary.ca">Alex.lohman@ucalgary.ca</a>
<b>Office Location</b>	HMRB 162 (Epp) and HMRB 159 (Lohman)	<b>Office Hours</b>	No formal office hours scheduled; please contact to schedule a meeting with either of us or TA
<b>Instructor Email Policy</b>	E-mail instructors as needed.		
<b>Telephone No.</b>	(403) 210-6349 (Epp) and (403) 220-2898 (Lohman)		
<b>TA Name, if applicable</b>	Trevor Low and Anastasia Stepanchuk	<b>Email</b>	Trevor Low - <a href="mailto:talow@ucalgary.ca">talow@ucalgary.ca</a> Anastasia Stepanchuk – <a href="mailto:Anastasia.stepanchuk@gmail.com">Anastasia.stepanchuk@gmail.com</a>
<b>Class Term, Days</b>	Tuesdays, Thursdays, and Fridays- Jan 14, 2020 - April 17, 2020		
<b>Class Times</b>	9AM-10:50AM		
<b>Class Location</b>	HSC 1405A, HSC G500, HSC G382 VC		

<b>COURSE INFORMATION/DESCRIPTION OF THE COURSE</b>
Introductory graduate-level course comprising lectures by course instructors and guest lecturers, student presentations based on selected research publications, and tutorials with graduate teaching assistants (TAs).

#### LEARNING RESOURCES/REQUIRED READING

No required resources. Some Instructors will suggest required reading, which will be posted on D2L.

Principles of Neural Science, Fifth Edition (Authors: Eric Kandel, James Schwartz, Thomas Jessell, Steven Siegelbaum, A.J. Hudspeth) and Neuroscience: Exploring the Brain (Authors: Mark F Bear, Barry W Connors, Michael A Paradiso) are always excellent references.

#### COURSE OBJECTIVES/LEARNING OUTCOMES

The overall objective is to provide Neuroscience graduate students with essential basic knowledge in the major areas of systems neuroscience, including Perception (e.g., pain), Learning & Memory, Movement (e.g., spinal cord, voluntary movement), Neurodegeneration (e.g., dementias), Neuroinflammation (e.g., multiple sclerosis), and Stress and Reward Systems (e.g., anxiety, addiction). The course is designed to have one basic science lecture explaining the underlying biology of a topic, followed by a clinical lecture that discusses an associated disease state. Understanding of current research priorities and methods are promoted by assigned readings and student presentations on recent research papers and also by the writing of a short research proposal. A mid-term and final exam will be used to assess knowledge comprehension. By the end of the course, graduate students should emerge better prepared to evaluate, understand, and perform research, as well as teach, in most areas of neuroscience.

#### CUT POINTS FOR GRADES

This course adheres to the grading system outlined in the University of Calgary, Faculty of Graduate Studies Calendar. Grades of A+ and A are not distinguished in the calculation of GPAs. Percentage/letter grade conversion used for this course is as follows

Grade	Grade Point Value	Percentage Conversion	Graduate Description
A+	4.00	95-100	Outstanding
A	4.00	90-94	Excellent – superior performance showing comprehensive understanding of the subject matter
A-	3.70	85-89	Very Good Performance
B+	3.30	77-84	Good Performance
B	3.00	72-76	Satisfactory Performance

B-	2.70	68-71	Minimum Pass for Students in the Faculty of Graduate Studies
C+	2.30	63-67	All grades below 'B-' are indicative of failure at the graduate level and cannot be counted toward Faculty of Graduate Studies course requirements

<b>Assessment Components:</b> The University policy on grading related matters is outlined in the <a href="#">2019-2020 Calendar</a> .			
Assessment Methods	Description	Weight %	Due Date <u>and</u> Time
Presentations	Weekly journal club style presentations on two papers assigned by each week's lecturer(s). Marking will be conducted by peer review and TAs will compile marks following each Friday presentation.	10%	Weekly (Fridays 9AM-1050AM)
Research Proposal	Two research topics will be provided by the course co-coordinators (Dr. Jonathan Epp and Dr. Alex Lohman). TAs will assign one of these two topics to each student who will then be required to write a 2 page research proposal containing relevant background, focused hypothesis, experimental aims, and expected outputs. Proposals will be marked by the course TAs and coordinators.	20%	April 17 <sup>th</sup> , 2020 by 1000PM
Exams	Each Instructor will provide questions for the mid-term or final exam. Please note: the final exam will NOT be comprehensive. All exam marking will be conducted by course Instructor who wrote the questions with the exception of Dr. Peter Stys's questions which will be marked by the TAs. No study aids or electronic devices are allowed during the exams.	2 x 35%	Feb 27, 2020 (mid-term) and date TBD during finals week, April 18-29, 2019 (final exam to be registered).

ASSESSMENT AND EVALUATION INFORMATION
<b>ATTENDANCE AND PARTICIPATION EXPECTATIONS:</b> All students are expected to attend and participate in all scheduled lectures, tutorials and exams.

**GUIDELINES FOR SUBMITTING ASSIGNMENTS:**

Students are required to submit research proposal in typed format, with no less than 2cm margins, 12pt font and standard line spacing. Late assignments will not be accepted unless agreed upon by the course coordinators prior to the due date.

**FINAL EXAMINATIONS:**

Final exam will not be comprehensive. It will occur outside of normal class time during University finals week and will be registered. Exam questions will be provided in paper format from the instructors.

**EXPECTATIONS FOR WRITING:**

Mid-term and final exams will be in written format. It is expected that all students will write clearly and legibly and not to exceed the allotted space for each question. The research proposal is required to be typed and submitted electronically to the TAs or course coordinators by the due date.

**LATE AND/OR MISSING ASSIGNMENTS:**

Late assignments are not accepted without the written permission from a Co-Coordinator.

**Is a passing grade on a particular component essential to pass the course as a whole?** NO

		COURSE TIMETABLE	
Course Schedule Date	Topic & Reading	Instructor	Assignments/Due Dates & Times
January 14 <sup>th</sup> , 2020	Intro to Systems Neuroscience	Dr. Jonathan Epp and Dr. Alex Lohman	
January 16 <sup>th</sup> , 2020	Introduction to Experimental Imaging	Dr. Jeff Dunn	
January 17 <sup>th</sup> , 2020	Novel Techniques in Systems Neuroscience	Dr. Jonathan Epp Dr. Alex Lohman Dr. Tamas Fuzesi Dr. Frank Visser	
January 21 <sup>st</sup> , 2020	Computational Systems Neuroscience	Dr. Wilten Nicola	
January 23 <sup>rd</sup> , 2020	Computational Systems Neuroscience	Dr. Wilten Nicola	
January 24 <sup>th</sup> , 2020	Student Paper Presentations from Dr. Wilten Nicola	TAs: Trevor Low and Anastasia Stepanchuk	Presentations marked by TAs

January 28 <sup>th</sup> , 2020	Learning and Memory	Dr. Jonathan Epp	
January 30 <sup>th</sup> , 2020	Learning and Memory	Dr. Jonathan Epp	
January 31 <sup>st</sup> , 2020	Student Paper Presentations from Dr. Jonathan Epp	TAs: Trevor Low and Anastasia Stepanchuk	Presentations marked by TAs
February 4 <sup>th</sup> , 2020	The Reward/Motivation System	Dr. Stephanie Borgland	
February 6 <sup>th</sup> , 2020	Addiction	Dr. Stephanie Borgland	
February 7 <sup>th</sup> , 2020	Student Paper Presentations from Dr. Stephanie Borgland	TAs: Trevor Low and Anastasia Stepanchuk	Presentations marked by TAs
February 11 <sup>th</sup> , 2020	Stress and the HPA axis	Dr. Jaideep Bains	
February 13 <sup>th</sup> , 2020	Anxiety/Depression	Dr. Jaideep Bains	
February 14 <sup>th</sup> , 2020	Student Paper Presentations from Dr. Jaideep Bains	TAs: Trevor Low and Anastasia Stepanchuk	Presentations marked by TAs
February 17 <sup>th</sup> -21 <sup>st</sup>	NO CLASS – READING WEEK		
February 25 <sup>th</sup> , 2020	Tutorial	TAs: Trevor Low and Anastasia Stepanchuk	Presentations marked by TAs
February 27 <sup>th</sup> , 2020	Mid-Term Exam	TAs: Trevor Low and Anastasia Stepanchuk	Exams marked by lecturers
February 28 <sup>th</sup> , 2020	Voluntary Control of Movement	Dr. Sean Dukelow	
March 3 <sup>rd</sup> , 2020	Spinal Cord Function	Dr. Aaron Phillips	
March 5 <sup>th</sup> , 2020	Spinal Cord Injury/Axon Regeneration	Dr. Aaron Phillips	
March 6 <sup>th</sup> , 2020	Student Paper Presentations from Dr. Aaron Phillips	TAs: Trevor Low and Anastasia Stepanchuk	Presentations marked by TAs
March 10 <sup>th</sup> , 2020	Temperature/Touch/Pain	Dr. Tuan Trang	
March 12 <sup>th</sup> , 2020	Chronic and Neuropathic Pain	Dr. Tuan Trang	

March 13 <sup>th</sup> , 2020	Student Paper Presentations from Dr. Tuan Trang	TAs: Trevor Low and Anastasia Stepanchuk	Presentations marked by TAs
March 17 <sup>th</sup> , 2020	Gut Microbiome	Dr. Jean-Baptiste Cavin	
March 19 <sup>th</sup> , 2020	Gut-Brain Axis	Dr. Jean-Baptiste Cavin	
March 20 <sup>th</sup> , 2020	Student Paper Presentations from Dr. Alex Lohman	TAs: Trevor Low and Anastasia Stepanchuk	Presentations marked by TAs
March 24 <sup>th</sup> , 2020	Neurodegenerative disease: Prions and protein misfolding	Dr. Peter Stys	
March 26 <sup>th</sup> , 2020	Neurodegenerative disease: Dementias	Dr. Peter Stys	
March 27 <sup>th</sup> , 2020	Student Paper Presentations from Dr. Peter Stys	TAs: Trevor Low and Anastasia Stepanchuk	Presentations marked by TAs
March 31 <sup>st</sup> , 2020	Neuroinflammation	Dr. Shalina Ousman	
April 2 <sup>nd</sup> , 2020	Multiple Sclerosis	Dr. Shalina Ousman	
April 3 <sup>rd</sup> , 2020	Student Paper Presentations from Dr. Shalina Ousman	TAs: Trevor Low and Anastasia Stepanchuk	Presentations marked by TAs
April 7 <sup>th</sup> , 2020	Traumatic Brain Injury (TBI)	Dr. Alex Lohman	
April 9 <sup>th</sup> , 2020	Neurodegeneration in TBI	Dr. Alex Lohman	
April 10 <sup>th</sup> , 2020	Student Paper Presentations from Dr. Jean-Baptiste Cavin	TAs: Trevor Low and Anastasia Stepanchuk	Presentations marked by TAs
April 14 <sup>th</sup> , 2020	Tutorial	TAs: Trevor Low and Anastasia Stepanchuk	
April 16 <sup>th</sup> , 2020	Tutorial	TAs: Trevor Low and Anastasia Stepanchuk	
April 17 <sup>th</sup> , 2020	Manuscript Review Due	TAs: Trevor Low and Anastasia Stepanchuk	Review Due by 10PM (MST). Marked by course coordinators and TAs
April 18 <sup>th</sup> -29 <sup>th</sup>	Final Exam (date TBD)	TAs: Trevor Low and Anastasia Stepanchuk	Exams marked by lecturers (and TAs for Dr. Peter Stys's questions)

#### INTERNET AND ELECTRONIC COMMUNICATION DEVICE INFORMATION

Cell phones must be turned off in class unless otherwise arranged with the instructor.



The use of laptop and mobile devices is acceptable when used in a manner appropriate to the course and classroom activities. Students are to refrain from accessing websites that may be distracting for fellow learners (e.g. personal emails, Facebook, YouTube). Students are responsible for being aware of the University's Internet and email use policy, which can be found at <https://www.ucalgary.ca/policies/files/policies/electronic-communicationspolicy.pdf>.

## **MEDIA AND RECORDING IN LEARNING ENVIRONMENTS**

### **Media recording for lesson capture**

The instructor may use media recordings to capture the delivery of a lecture. These recordings are intended to be used for lecture capture only and will not be used for any other purpose. Although the recording device will be fixed on the Instructor, in the event that incidental student participation is recorded, the instructor will ensure that any identifiable content (video or audio) is masked, or will seek consent to include the identifiable student content to making the content available on University approved platforms.

### **Media recording for assessment of student learning**

The instructor may use media recordings as part of the assessment of students. This may include but is not limited to classroom discussions, presentations, clinical practice, or skills testing that occur during the course. These recordings will be used for student assessment purposes only and will not be shared or used for any other purpose.

### **Media recording for self-assessment of teaching practices**

The instructor may use media recordings as a tool for self-assessment of their teaching practices. Although the recording device will be fixed on the instructor, it is possible that student participation in the course may be inadvertently captured. These recordings will be used for instructor self-assessment only and will not be used for any other purpose.

### **Student Recording of Lectures**

Audio or video recording of lectures is prohibited except where explicit permission has been received from the instructor.

## **UNIVERSITY OF CALGARY POLICIES AND SUPPORTS**

### **ACADEMIC ACCOMMODATIONS**

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services; SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit [www.ucalgary.ca/access/](http://www.ucalgary.ca/access/). Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their Instructor. The full

policy on Student Accommodations is available at <http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf>

### **IMPORTANT INFORMATION**

Any research in which students are invited to participate will be explained in class and approved by the appropriate University Research Ethics Board

### **COPYRIGHT**

It is the responsibility of students and professors to ensure that materials they post or distribute to others comply with the Copyright Act and the University's Fair Dealing Guidance for Students ([library.ucalgary.ca/files/library/guidance\\_for\\_students.pdf](http://library.ucalgary.ca/files/library/guidance_for_students.pdf)). Further information for students is available on the Copyright Office web page ( <https://library.ucalgary.ca/copyright>)

### **A NOTE REGARDING INSTRUCTOR INTELLECTUAL PROPERTY**

Generally speaking, course materials created by professor(s) (including course outlines, presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the professor (s). These materials may NOT be reproduced, redistributed or copied without the explicit consent of the professor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course *at the same time* may be allowed under fair dealing

### **ACADEMIC INTEGRITY**

The Cumming School of Medicine expects intellectual honesty from its students. Course participants should be aware of University policies relating to Principles of Conduct, Plagiarism and Academic Integrity. These are found in the printed Faculty of Graduate Studies Calendar, or online under Academic Regulations in the Faculty of Graduate Studies Calendar, available at [Faculty of Graduate Studies Academic Regulations](#)

### **ACADEMIC MISCONDUCT**

For information on academic misconduct and its consequences, please see the University of Calgary Calendar at <http://www.ucalgary.ca/pubs/calendar/current/k.html>

### **EMERGENCY EVACUATION AND ASSEMBLY POINTS**

Assembly points for emergencies have been identified across campus. The primary assembly points for South Campus (Health Science Centre (HSC); Health & Research Innovation Centre (HRIC); Heritage Medical Research Building (HMRB) and Teaching, Research and Wellness (TRW)) are:

- HSC and HMRB: HRIC Atrium (alternate assembly point is Parking Lot 6)
- HRIC: HMRB Atrium (alternate assembly point is Parking Lot 6)
- TRW: McCaig Tower (alternate assembly point is HMRB – Atrium)

### **APPEALS**

If there is a concern with the course, academic matter or a grade, first communicate with the instructor. If these concerns cannot be resolved, students can proceed with an academic appeal, as per Section N of the Faculty of Graduate Studies Calendar. Students must follow the official process and should contact the Student Ombuds Office (<http://www.ucalgary.ca/provost/students/ombuds>) for assistance with this and with any other academic concerns, including academic and non-academic misconduct





### **THE FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY (FOIP) ACT**

This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIP) and students should identify themselves on written assignments (exams and term work.) by their name and ID number on the front page and ID on each subsequent page. Assignments given by you to your course instructor will remain confidential unless otherwise stated before submission. The assignment cannot be returned to anyone else without your expressed permission to the instructor. Grades will be made available on an individual basis and students will not have access to other students' grades without expressed consent. Similarly, any information about yourself that you share with your course instructor will not be given to anyone else without your permission

### **WELLNESS AND MENTAL HEALTH RESOURCES**

The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the excellent mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre), <https://www.ucalgary.ca/wellnesscentre/services/mental-health-services> and the Campus Mental Health Strategy website <https://www.ucalgary.ca/mentalhealth/>

### **SUPPORTS FOR STUDENT LEARNING, SUCCESS, AND SAFETY**

**Student Ombudsman:** The Student Ombuds' Office supports and provides a safe, neutral space for students. For more information, please visit [www.ucalgary.ca/ombuds/](http://www.ucalgary.ca/ombuds/) or email [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca)

**Student Union:** The SU Vice-President Academic can be reached at (403) 220-3911 or [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca); Information about the SU, including elected Faculty Representatives can be found here: <https://www.su.ucalgary.ca>

**Graduate Student's Association:** The GSA Vice-President Academic can be reached at (403) 220- 5997 or [gsa.vpa@ucalgary.ca](mailto:gsa.vpa@ucalgary.ca); Information about the GSA can be found here: <https://gsa.ucalgary.ca>

### **SAFEWALK**

Campus security will escort individuals, day or night, anywhere on campus (including McMahon Stadium, Health Sciences Centre, Student Family Housing, the Alberta Children's Hospital and the University LRT station). Call 403-220-5333 or visit <http://www.ucalgary.ca/security/safewalk>. Use any campus phone, emergency phone or the yellow phone located at most parking lot pay booths. Please ensure your personal safety by taking advantage of this service.