



**CUMMING SCHOOL OF MEDICINE
GRADUATE COURSE OUTLINE**

COURSE TITLE: Cardiovascular Physiology			
Course	MDSC 629.01		
Pre/Co-Requisites	Consent of the Faculty		
Faculty	Cumming School of Medicine, Graduate Science Education		
Instructor Name(s)	Drs. Robert Rose (course coordinator) J Tyberg N Fine B Mitchell W Chen H ter Keurs D Belke A Braun T Anderson S Raj	Email	robert.rose@ucalgary.ca
Office Location	HRIC GAC66	Office Hours	By appointment
Instructor Email Policy	Email welcome		
Telephone No.	403-210-3922		
Class Term, Days	Fall 2019, Wednesday		
Class Times	9:00 AM – 11:50 AM		
Class Location	HS G743, except Oct 2 (HS O1508) and Nov 20 (HS 1405B)		

COURSE INFORMATION/DESCRIPTION OF THE COURSE
This course provides an in-depth, mechanistic survey of cardiovascular physiology at the organ, cellular and molecular levels. Designed for graduate students and upper-level undergraduate students in the medical sciences, kinesiology and bioengineering.
LEARNING RESOURCES/REQUIRED READING
Recommended reading will be based on scientific papers assigned by each instructor.



COURSE OBJECTIVES/LEARNING OUTCOMES

To provide a detailed survey of major concepts in areas of cardiovascular physiology at a depth appropriate for students who are interested in research careers.

By the end of this course, using the lectures provided and the recommended reading, students will gain a strong understanding of the cardiovascular system, including the heart and the vasculature, at the organ/organism level as well as the cellular and molecular levels.

Students will also gain experience reading, interpreting and presenting current literature in the field of cardiovascular physiology and will also gain experience in scientific writing.

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

Assessment Components: The University policy on grading related matters is outlined in the [2019-2020 Calendar](#).

Assessment Methods	Description	Weight	Due Date <u>and</u> Time
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		%	
Paper Presentation	Each student will be required to present a paper on one of the topics being covered during the term. The paper will be assigned by the instructor for that topic. Students will pick the topic of their presentation during the first week of class. Grading rubric will be provided in advance.	20%	Presentations will take place in the last hour of class for each topic.
Term paper	Each student will write a focused review based on one of the topics covered in the course. Students should choose one of the course lecture topics that they wish to explore in more detail and finalize a topic for their paper in consultation with the relevant instructor and the course coordinator. The paper should not exceed 20 double spaced pages in length (not including figures and references). Grading rubric will be provided in advance.	30%	November 29, 2019 11:59 PM
Participation	A course participation mark will be assigned to the students based on their involvement in classroom discussions. Attendance at lectures is mandatory to facilitate these discussions.	10%	
Final examination	Final exam will consist of a series of questions to be answered in written long-answer form.	40%	To be scheduled by registrar

ASSESSMENT AND EVALUATION INFORMATION

ATTENDANCE AND PARTICIPATION EXPECTATIONS:

A course participation mark will be assigned to the students based on their involvement in classroom discussions. Attendance at lectures is mandatory to facilitate these discussions.

GUIDELINES FOR SUBMITTING ASSIGNMENTS:

Assignments are to be submitted by email to the course coordinator (Dr. Robert Rose)

FINAL EXAMINATIONS:

Written final examination to be scheduled by the registrar.

EXPECTATIONS FOR WRITING:

LATE AND/OR MISSING ASSIGNMENTS:

Late assignments will receive a 10% reduction in score for each day beyond the deadline.

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
September 11, 2019	Physical principles of the circulation The cardiac cycle Arterial hemodynamics Assessment of ventricular performance	Dr. J Tyberg	
September 18, 2019	Regulation of cardiac output	Dr. J Tyberg	
September 25, 2019	Imaging/echocardiography	Dr. N Fine	
October 2, 2019	Cardiac Electrophysiology	Dr. R Rose	
October 9, 2019	Fundamentals of Electrocardiography	Dr. B Mitchell	
October 16, 2019	Excitation-contraction coupling	Dr. W Chen	
October 23, 2019	Sarcomere proteins/mechanics	Dr. H ter Keurs	
October 30, 2019	Physiology of the sinoatrial node	Dr. R Rose	
November 6, 2019	Cardiac energy metabolism	Dr. D Belke	
November 13, 2019	Reading Week – no class		
November 20, 2019	Physiology of vascular smooth muscle	Dr. A Braun	
November 27, 2019	Humoral regulation of the circulation	Dr. T Anderson	
December 4, 2019	Autonomic regulation of the heart	Dr. S Raj	

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/. 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

INSTRUCTOR INTELLECTUAL PROPERTY

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.

COPYRIGHT LEGISLATION

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright (www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf) and requirements of the copyright act (<https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html>) to ensure they are aware of the consequences of unauthorised sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.

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/ or email ombuds@ucalgary.ca

Student Union: The SU Vice-President Academic can be reached at (403) 220-3911 or 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; 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.