

Queen's University

**School of Kinesiology and Health Studies**

**KNPE 225 / 3.0 - Integrative Physiology of Human Movement  
Fall 2014**

Instructor: Brendon Gurd

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Office Hours: Anytime by appointment (Appointments can be made with Professor Gurd before or after lecture)

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**Lectures:**

Monday 8:30 KINE 100

Thursday at 10:00 KINE 100

**Tutorials:** (Held every week starting in Week 1)

002 Friday 9:30 HUMPHY 131

006 Friday 9:30 HUMPHY 132

003 Thurs 12:30 BIOSCI 1120

007 Thurs 12:30 ONTARO 206

004 Thurs 2:30 HUMPHY 131

008 Thurs 2:30 HUMPHY 132

005 Fri 9:30 DUNNING 10

009 Fri 9:30 ONTARO 206

## **Course Description:**

This course is designed to develop an understanding of the concept of homeostasis and the integrated control of cellular and organ responses involved in regulation and maintenance of homeostasis. Special emphasis will be placed on the systems that respond to exercise stress.

## **Intended Student Learning Outcomes:**

1. Continue to develop the conceptual frameworks of control and regulation of physiological systems begun in KNPE 125
2. Gain an advanced understanding of the basic models of physiological control and how these models can be used to understand changes in any physiological variable
3. Learn how to develop a detailed model of control for several different physiological systems and how to use these models to solve physiological problems
4. Continue to learn how to extract information efficiently and effectively from journal articles

Learning Objective	Evaluation Method	Material to be Evaluated
1. Continue to develop the basic understanding of physiology, the conceptual frameworks of control and regulation of physiological systems begun in KNPE 125	Mechanisms Quizzes (4 total, completed online; 8% of final mark)  Unit Tests (4 total, held in lecture; 48% of final mark each)	All material on quizzes tests will be taken directly from material presented in lecture, tutorial, and assigned readings
2. Gain an advanced understanding of the basic models of physiological control and how these models can be used to understand changes in any physiological variable	Mechanisms Quizzes and Unit Tests (See above for details)  Tutorial assignments and in class iClicker questions	Material to be evaluated for this component of the course will be covered extensively in lecture
3. Learn how to develop a detailed model of control for several different physiological systems and how to use these models to solve physiological problems	Unit Tests (see above) and Final Exam	Unit Tests will cover material from lecture, tutorial and assigned readings. The final exam will require group problem solving of problems associated with the topics covered in each unit.
4. Continue to learn how to extract information efficiently and effectively from journal articles	In Class Problems, Problem Solving Presentations and Final Exam	Questions associated with assigned readings and papers found in the process of testing hypotheses generated during the problem solving presentation assignments

**Textbook &/or Courseware Package:** *(Recommended Resources)*

*\*\*\*These resources are considered supplementary material. No assigned readings for this course will come from these texts, and all testing material will be taken directly from material covered in lecture and tutorial.\*\*\**

Principles of Human Physiology. Cindy L. Stanfield. Pearson, Toronto.

Vander's Human Physiology: The Mechanisms of Body Function, 10th edition. E.P. Widmaier, H. Raff, K.T. Strang. McGraw Hill Higher Education, New York.

Textbook of Medical Physiology: 11<sup>th</sup> Edition. Arthur C. Guyton & John E. Hall. Elsevier Saunders, Philadelphia.

**Course Notes:**

- PowerPoint slides of lectures will be posted on moodle by 6pm the night before each lecture.

**Readings:**

Readings will be provided assigned for each unit and will be used as a component of problem solving assignments during lecture. You are only responsible for the information required to answer the questions provided in lecture and are not expected to read any papers in their entirety (although you are encouraged to do so if you're interested!).

**Top Hat:**

Throughout lectures there will be questions and discussions posted that will only be able to be accessed via the web-based program Top Hat. Top hat can be accessed through your computer, a tablet, or your phone and while there are no marks associated with your participation in Top Hat activities it is strongly suggested that you register an account with Top Hat and participate in this component of the course. The cost for using Top Hat for this course will be approximately \$20. Participation will be associated with bonus marks, similar to the iClicker bonus from KNPE 125.

To register a Top Hat account go to <https://tophat.com>

To participate in KNPE 225 activities you can text responses to **+1 (647) 931-6505**, you can visit this URL <https://tophat.com/e/049377> or you can download the Top Hat app if you are using an mobile device.

The Top Hat course code for KNPE 225 is **049377**.

## Lecture Schedule:

Lecture - Date	Topic
<b>Unit 1 – Introduction and Review of Physiological Control</b>	
1 - M Sept 8	Introduction and Physiological Control and Model Systems 1
2 - Th Sept 11	Physiological Control and Model Systems 2
<b>Unit 2 – Acute Regulation of Mean Arterial Pressure</b>	
Sun Sept 14	Unit 2 Reading Quiz
3 - M Sept 15	Acute Regulation of MAP 1
4 - Th Sept 18	Acute Regulation of MAP 2
5 - M Sept 22	Acute Regulation of MAP 3
<b>Th Sept 25</b>	<b>TEST 1 – ACUTE REGULATION OF MEAN ARTERIAL PRESSURE</b>
<b>Unit 3 – Chronic Regulation of Mean Arterial Pressure</b>	
Sun Sept 28	Unit 3 Reading Quiz
6 - M Sept 29	Chronic Regulation of MAP 1
7 - Th Oct 2	Chronic Regulation of MAP 2
8 - M Oct 6	Chronic Regulation of MAP 3
<b>Th Oct 9</b>	<b>TEST 2 – CHRONIC REGULATION OF MEAN ARTERIAL PRESSURE</b>
<b>October 13 - Thanksgiving Week!</b>	
<b>Unit 4 – Regulation of Blood Gases</b>	
Sun Oct 19	Unit 4 Reading Quiz
9 - M Oct 20	Regulation of Blood Gases 1
10 - Th Oct 23	Regulation of Blood Gases 2
11 - M Oct 27	Regulation of Blood Gases 3
<b>Th Oct 30</b>	<b>TEST 3 – REGULATION OF BLOOD GASES</b>
<b>Unit 5 – Acute Regulation of Cellular ATP</b>	
Sun Nov 2	Unit 4 Reading Quiz
12 - M Nov 3	Acute Regulation of ATP 1
13 - Th Nov 6	Acute Regulation of ATP 2
14 - M Nov 10	
<b>Th Nov 13</b>	<b>TEST 4 - ACUTE REGULATION OF CELLULAR ATP</b>
<b>Unit 6 – Regulation of Blood Glucose</b>	
Sun Nov 16	Unit 5 Reading Quiz
15 - M Nov 17	Regulation of Blood Glucose 1
16 - Th Nov 20	Regulation of Blood Glucose 2
17 - M Nov 24	Regulation of Blood Glucose 3
<b>T Nov 27</b>	<b>TEST 5 - REGULATION OF BLOOD GLUCOSE</b>
<b>FINAL EXAM</b>	

## **Tutorial Schedule:**

Tutorial - Week	Topic and Required Readings
Week 1, Sept 11/12	<b>Introduction Tutorial (TEAM BUILDING)</b>
Week 2, Sept 18/19	Unit 2 Mechanism to Symptom Workshop
Week 3, Sept 25/26	Unit 2 Problem Presentations
Week 4, Oct 2/3	Unit 3 Mechanism to Symptom Workshop
Week 5, Oct 9/10	Unit 3 Problem Presentations
Week 6, Oct 16/17	<b>NO TUTORIAL: THANKSGIVING</b>
Week 7, Oct 23/24	Unit 4 Mechanism to Symptom Workshop
Week 8, Oct 30/31	Unit 4 Problem Presentations
Week 9, Nov 6/7	Unit 5 Mechanism to Symptom Workshop
Week 10, Nov 13/14	Unit 5 Problem Presentations
Week 11, Nov 20/21	Unit 6 Mechanism to Symptom Workshop
Week 12, Nov 27/28	Unit 6 Problem Presentations

**Team Building:** Throughout KNPE 225 you will be working with a team of 4-5 people on a series of Problem Solving Presentations. In addition, the Physiology Cup will be awarded to the team with the highest total of Physiology Cup Bonus points. The first tutorial of the semester will be dedicated to getting to know your team, establishing team goals, roles, and responsibilities.

**Mechanism to Symptom Workshop:** For all units there will be an extra help session held during the unit that is designed to give you and your team a chance to ask your TA questions on the mechanisms covered, and to work on the mechanism-to-symptom sample problems, for that unit.

**Problem Presentations:** At the end of each unit your tutorial team will give a 6 slide presentation (approximately 5-10 minutes long; detailing the hypothesis you tested, and the results of your test) related to one of the problems from the problem solving session for that unit. A template that is to be used for all presentations is available on the course moodle page.

## **Evaluation:**

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<b>Unit 1 - NO MARKS</b>	
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<b>Unit 2 - ACUTE REGULATION OF MEAN ARTERIAL PRESSURE</b>	
Mechanisms Quiz (Due Sunday Sept 14 <sup>th</sup> at 11:59pm)	2%
Problem Presentation (Tutorial on Sept 25 <sup>th</sup> /26 <sup>th</sup> )	3%
Unit 2 Test (10 am Thursday Sept 25 <sup>th</sup> KINE 100)	12%
Test Re-write	BONUS
<b>Total</b>	<b>17%</b>
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<b>Unit 3 - CHRONIC REGULATION OF MEAN ARTERIAL PRESSURE</b>	
Mechanisms Quiz (Due Sunday Sept 28 <sup>th</sup> at 11:59pm)	2%
Problem Presentation (Tutorial on Oct 9 <sup>th</sup> /10 <sup>th</sup> )	3%
Unit 3 Test (10 am Thursday Oct 9 <sup>th</sup> KINE 100)	12%
Test Re-write	BONUS
<b>Total</b>	<b>17%</b>
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<b>Unit 4 - REGULATION OF BLOOD GASES</b>	
Mechanisms Quiz (Due Sunday Oct 19 <sup>th</sup> at 11:59pm)	2%
Problem Presentation (Tutorial on Oct 30 <sup>th</sup> /31 <sup>st</sup> )	3%
Unit 4 Test (10 am Thursday Oct 30 <sup>th</sup> KINE 100)	12%
Test Re-write	BONUS
<b>Total</b>	<b>17%</b>
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<b>Unit 5 - ACUTE REGULATION OF CELLULAR ATP</b>	
Mechanisms Quiz (Due Sunday Nov 2 <sup>nd</sup> at 11:59pm)	2%
Problem Presentation (Tutorial on Oct Nov 13 <sup>th</sup> /14 <sup>th</sup> )	3%
Unit 5 Test (10 am Thursday Nov 13 <sup>th</sup> KINE 100)	12%
Test Re-write	BONUS
<b>Total</b>	<b>17%</b>
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<b>Unit 6 - REGULATION OF BLOOD GLUCOSE</b>	
Mechanisms Quiz (Due Sunday Nov 16 <sup>th</sup> at 11:59pm)	2%
Problem Presentation (Tutorial on Oct Nov 27 <sup>th</sup> /28 <sup>th</sup> )	3%
Unit 5 Test (10 am Thursday Nov 27 <sup>th</sup> KINE 100)	12%
Test Re-write	BONUS
<b>Total</b>	<b>17%</b>
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<b>Final Exam</b> (To be scheduled during Exam Period)	
<b>Total</b>	<b>15%</b>

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## Mechanism Quizzes:

At the beginning of each unit a quiz will be posted on Moodle based on the mechanisms lecture assigned for that Unit. Each lecture will be ~30 slides and will review the core mechanisms that will be covered in that unit. All quizzes will be out of 10 marks.

Marking scheme for Mechanism Quizzes:

Quiz Mark	Letter Grade	Grade Points	Descriptor
10	A+	4.3	Exceptional; significantly exceeds the highest expectations for the assignment or course
9	A-	3.7	Excellent; meets very high standards for the assignment or course
8	B	3.0	Good; meets most standards for the assignment or course
6 or 7	D	1.0	Minimally acceptable; passing grade
<6	F	0.0	Failure

## Tutorial Presentations:

At the end of each unit your tutorial team will give a 5 slide presentation (approximately 5 minutes long) detailing the hypothesis you tested, and the results of your test, related to one of the problems from the problem solving session for that unit. A template that is to be used for all presentations is available on the course moodle page.

Marking scheme for Tutorial Presentations:

Mark	Letter Grade	Grade Points	Descriptor
3	A+	4.3	Clearly demonstrates thought and effort. Presentation and process are excellent
2	A	4.0	Problem/hypothesis/and supporting results are all presented.
1	B	3.0	Required parts of the presentation are missing.
0	F	0.0	No presentation was given

## Unit Tests:

All Unit Tests will be held in the lecture hall (KINES 100) during regularly scheduled lecture times. Tests will be comprised of 2 different types of multiple choice questions: Physiological detail questions (mechanisms of physiological function), and Model system problems (answering question using the models developed during each unit). Examples of both types of questions will be provided in lecture throughout the course.

Marking scheme for Unit Tests:

<b>Test Mark</b>	<b>Letter Grade</b>	<b>Grade Points</b>	<b>Descriptor</b>
29-30	A+	4.3	Exceptional; significantly exceeds the highest expectations for the assignment or course
27-28	A	4.0	Outstanding; meets the highest standards for the assignment or course
25-26	A-	3.7	Excellent; meets very high standards for the assignment or course
24	B+	3.3	Very good; meets high standards for the assignment or course
22-23	B	3.0	Good; meets most standards for the assignment or course
21	B-	2.7	More than adequate; shows some reasonable command of material
20	C+	2.3	Acceptable; meets basic standards for the assignment or course
19	C	2.0	Acceptable; meets some of the basic standards for the assignment or course
18	C-	1.7	Acceptable; while falling short of meeting the basic standards for the assignment or course
17	D+	1.3	Minimally acceptable
16	D	1.0	Minimally acceptable; passing grade
15	D-	0.7	Minimally acceptable; lowest passing grade
<15	F	0.0	Failure



## Final Exam:

The final exam will require you, and your group, to solve a physiological problem using the problem solving process taught throughout the course. This exam will be scheduled during the December exam period.

As this is a final exam you will not be allowed to ask questions of your proctors, however, any aids you wish to use, including notes, your models from previous Unit tests, computers, and/or classmates are allowed and even encouraged.

### Marking Scheme for Final Exam:

<b>Letter Grade</b>	<b>Grade Points</b>	<b>Descriptor</b>
A+	4.3	Exceptional; significantly exceeds the highest expectations for the assignment or course
A	4.0	Outstanding; meets the highest standards for the assignment or course
A-	3.7	Excellent; meets very high standards for the assignment or course
B	3.0	Good; meets most standards for the assignment or course
C	2.0	Acceptable; meets some of the basic standards for the assignment or course
D	1.0	Minimally acceptable; passing grade
F	0.0	Failure

## Physiology Cup Quiz Bonus:

There will be the possibility for obtaining bonus marks through participation in physiology cup activities including Top Hat activities. Details will be discussed in lecture.

All components of this course will receive letter grades which, for purposes of calculating your course average, will be translated into numerical equivalents using the Faculty of Arts and Science approved scale (see below). Your course average will then be converted to a final letter grade according to Queen's Official Grade Conversion Scale (see below).

**Arts & Science Letter Grade Input Scheme**

Assignment mark	Numerical value for calculation of final mark
A+	93
A	87
A-	82
B+	78
B	75
B-	72
C+	68
C	65
C-	62
D+	58
D	55
D-	52
F48 (F+)	48
F24 (F)	24
F0 (0)	0

**Queen's Official Grade Conversion Scale**

Grade	Numerical Course Average (Range)
A+	90-100
A	85-89
A-	80-84
B+	77-79
B	73-76
B-	70-72
C+	67-69
C	63-66
C-	60-62
D+	57-59
D	53-56
D-	50-52
F	49 and below

Students are responsible for keeping back-up copies of all written work and assignments for this class. You should always have at least one updated hard copy of your work (rather than just one electronic version either on diskette, hard drive or whatever). Computer or disk problems will not be accepted as an excuse to hand in a late assignment.

"This material is copyrighted and is for the sole use of students registered in KNPE 225. This material shall not be distributed or disseminated to anyone other than students registered in KNPE 225. Failure to abide by these conditions is a breach of copyright, and may also constitute a breach of academic integrity under the University Senate's Academic Integrity Policy Statement."

### **Disability Accommodations Statement:**

Queen's University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a disability and think you may need accommodations, you are strongly encouraged to contact the Disability Services Office (DSO) and register as early as possible. For more information, including important deadlines, please visit the DSO website at: <http://www.queensu.ca/hcds/ds/>

"This material is copyrighted and is for the sole use of students registered in [the course]. This material shall not be distributed or disseminated to anyone other than students registered in [the course]. Failure to abide by these conditions is a breach of copyright, and may also constitute a breach of academic integrity under the University Senate's Academic Integrity Policy Statement."

## School of Kinesiology and Health Studies – Regulations and Policies

### Academic Integrity

The School of Kinesiology and Health Studies policy related to breaches of academic integrity is as follows. The minimum penalty assessed for such a finding will be **a grade of zero on the work in question plus the subtraction of the value of the assignment from the student's final grade.**

### Exams and Midterms Polices

- As per University regulations, requests for accommodation for exams, midterms and course assignments must be received by the instructor in a timely manner and at least a week in advance of the test or due date. Students who are entitled to accommodations (e.g. special requirements such as additional time for written tests) are asked to discuss their requirements with the instructor at the start of the course. Official documentation is required to support such requests. Do NOT leave requests to the last minute.
- Students who are unable to write an exam on the published date are typically not permitted to write in advance of the class. Students seeking permission to write the exam at an earlier time than the scheduled time must appeal in writing to the Office of the Associate Dean (Studies) as well as to the instructor.
- Requests for an alternate midterm/exam times or an extension for course assignments for the purpose of accommodating travel arrangements for personal reasons, either during the term or before the end of the University's official exam period will be automatically denied.
- Except in extenuating circumstances, deferred exams must be written no later than within the first two weeks of the subsequent term. When possible, a common deferred exam date will be set for all students in the course.

## Faculty of Arts and Science Regulations and Policies

Students should refer to the regulation section of the current Arts and Science Calendar to familiarize themselves about the academic regulations that are applicable to course work and academic performance. Specifically, please note the following regulations:

- Regulation 1: Academic Integrity
- Regulation 6: Attendance, Course Work and Conduct
- Regulation 7: Assessment of Performance
- Regulation 8: Final Examinations and General Examinations
- Regulation 9: Examination Conduct
- Regulation 10: System of Grading and Transcript Notations
- Regulation 11: Review of Grades and Examinations
- Regulation 17: Misconduct in an Academic or Non-Academic Setting

In particular, students should note the changes to **Regulation 1 Academic Integrity** (formerly Academic Dishonesty). Highlights from this regulation include:

The Queen's University Senate *Policy on Academic Integrity* may be found on the internet at <http://www.queensu.ca/secretariat/policies/senateandtrustees/academicintegrity.html>

Academic integrity is constituted by the five core fundamental values of honesty, trust, fairness, respect and responsibility (see [www.academicintegrity.org](http://www.academicintegrity.org)). These values are central to the building, nurturing and sustaining of an academic community in which all members of the community will thrive. Adherence to the values expressed through academic integrity forms a foundation for the "freedom of inquiry and exchange of ideas" essential to the intellectual life of the University (see the Senate Report on Principles and Priorities, at <http://www.queensu.ca/secretariat/policies/senateandtrustees/principlespriorities.html>).

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments conform to the principles of academic integrity.

Information on academic integrity is available in the Arts and Science Calendar, on the Arts and Science website (see <http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations/regulation-1>), and from the instructor of this course.

Departures from academic integrity include plagiarism, use of unauthorized materials, facilitation, forgery and falsification, and are antithetical to the development of an academic community at Queen's. Given the seriousness of these matters, actions which contravene the regulation on academic integrity carry sanctions that can range from a warning or the loss of grades on an assignment to the failure of a course to a requirement to withdraw from the university.

### **Exam Accommodations**

**In order of priority:**

#### **1. Matters of Human Rights**

**DISABILITIES:** Please note that it is important to contact Disability Services (LaSalle Bldg. 613-533-6467) as early as possible in the academic year to allow time for you to be registered for special needs consideration. Students already registered with Disability Services (LaSalle Bldg. 613-533-6467) should request accommodation from the instructor **at least one week prior to the exam or test**. Students not yet registered with Disability Services may request accommodation, but it may not be possible to provide the appropriate accommodations in a timely fashion in such instances.

**FAITH OBSERVANCE:** Should you require accommodation due to faith observance, please contact the instructor as early as possible to allow appropriate alternative arrangements to be made. If requests for accommodation are not made **at least one week prior to the exam or test**, it may not be possible to accommodate in a timely fashion.

#### **2. Extenuating Circumstances beyond a Student's Control**

**ILLNESS:** You are expected to comply with **Academic Regulation 6.3, Absence and Missed Course Work etc.** If you are too ill to write an exam you **must** document this either with a medical certificate (if available) or by notifying the instructor in writing (with your signature). If you are ill for an extended period of time, it is your responsibility to contact the instructor immediately on your return to campus.

### **SKHS Communications**

The SKHS Undergraduate office sends out a weekly communication called the *UG NEWS*. It is important that you read this communication since it is one of the key ways that we distribute program information, key deadlines, news and opportunities to students. Back issues of the *UG NEWS* are also posted on the SKHS web site at <http://www.queensu.ca/skhs/news-and-events/news/undergraduate>