



BIOL2220

Systems Physiology

Session 2, Infrequent attendance, North Ryde 2020

Department of Biological Sciences

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Disclaimer

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Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

General Information

Unit convenor and teaching staff

Course convenor

Andrew Barron

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Senior Scientific Officer and Practical Convenor

Prasanth Subramani

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Credit points

10

Prerequisites

(BIOL2230 or BIOL257) or (20cp from (BIOL1110 or BIOL115) and ((BIOL1210 or BIOL108) or (BIOL1310 or BIOL114) or (BIOL1320 or BIOL122) or (BIOL1610 or BIOL116))) or ((PSYU1104 or PSYC104) and (PSYU1105 or PSYC105)) or ((ANAT1001 or HLTH108) and (ANAT1002 or HLTH109))

Corequisites

Co-badged status

Unit description

This unit considers the maintenance of body homeostasis. We investigate the cardiovascular system including an examination of the electrical and mechanical functions of the heart, its interaction with the blood vessels, and the hormones and the autonomic nervous system that control heart function. Next we study the role of the renal system in the control of the chemical composition of the body, water balance and body fluid volume. An overview of the respiratory and gastrointestinal systems will follow. Practical classes involve measuring physiological parameters such as blood pressure and electrical conduction through the heart (the ECG) in humans.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: Explain how the cardiovascular, renal and respiratory systems contribute to the

maintenance of homeostasis

ULO2: Relate specific structural features of organs to essential system functions

ULO3: Interpret physiological processes using equations of physical, chemical, and electrical properties

ULO4: Analyse data, and synthesise and communicate the implications of experimental results

ULO5: Perform experiments safely with human subjects and accurately collect data, demonstrating adherence to Macquarie University Human Research Ethics Committee sanctioned protocols

ULO6: Identify situations in which organ systems interact to produce a co-ordinated response

General Assessment Information

Assessment details

A hurdle requirement is an activity for which a minimum level of performance or participation is a condition of passing a unit. The hurdle requirement in BIOL2220 in 2020 is that you must complete and submit all three practical assignments.

Assignment due dates and marks

	% total mark	Date due for internal students	Date due for external students
Eight online quizzes	20	See quiz timetable below	
Mid-semester test on cardiovascular and renal systems	15	Offered in allocated practical sessions in week 7 (7,8 or 9 September 2020)	21 September 2020 (morning of day 1 of second external practical block)
Practical assignments 1 and 2	10	Friday of the week following completion of practical ECG assignment – week 3 prac, deadline 21 August 2020 Blood pressure prac – week 4, deadline 28 August 2020	4 September 2020
Practical assignment – permeability and osmolarity 3	5	29 September 2020 (post mid semester break)	
Final exam	50	Exam period – date to be determined	

Practical classes and assignments

Practical classes will run in online mode throughout the semester and will be delivered by Zoom. For external students practical classes will be delivered in blocks. On enrollment you will be assigned your practical dates and you are expected to attend all practical classes. There are written assignments associated with the ECG, Cardiovascular System (Posture) and the Permeability practical classes. There will also be an online quiz that will include the content of the Digestion practical.

The details of each of the three practical assignments are in the practical manual which can be accessed through iLearn. The completed assignments must be submitted to Turnitin by 11.59 on due dates seen in the table above. No paper copies will be accepted.

Mid-semester Test

This test will include 35 multiple choice questions to be completed in 50 minutes. All of the cardiovascular section, the first three renal lectures (lectures 1-12) and the material presented in the completed practical classes may be included in the test. You must complete the test individually. During the test you will see only one question at a time. You will have only one chance to answer each question. You may not go back in the quiz to correct any answers. Think carefully before answering and budget your overall time carefully.

Online quizzes

All eight quizzes are in the form of multiple choice questions and will be available from 1pm on the Thursday until Wednesday midnight of the following week. The time limit to complete each quiz will vary with the number of questions. Only one attempt at each quiz is allowed. Similar to the mid-semester test you will see only one question at a time. You will have only one chance to answer each question. You may not go back in the quiz to correct any answers. Think carefully before answering and budget your overall time carefully.

Quiz timetable

Quiz	Content	Week	Quiz opens 1pm	Quiz closes 23:59
Q1	Content of lectures 1-4	2	6 August 2020	12 August 2020
Q2	ECG practical class	3	13 August 2020 (internals) 27 August 2020 (externals)	19 August 2020 (internals) 2 September 2020 (externals)
Q3	BP practical class and L8- L9	5	27 August 2020	2 September 2020

Q4	CV revision L1 to L9	6	3 September 2020	9 September 2020
Q5	Renal revision	8	1 October 2020	7 October 2020
Q6	Respiratory revision	10	15 October 2020	21 October 2020
Q7	Digestion revision	11	22 October 2020	28 October 2020
Q8	Digestion practical	12	31/10	6/11

Final Exam

The exam is a two hour paper with multiple choice questions, and short answer questions All the lecture and practical material is examinable.

Assessment Tasks

Name	Weighting	Hurdle	Due
Online Quizzes	35%	No	see assignment information below
Practical class assignments	15%	Yes	see assignment information below
Final Exam	50%	No	scheduled in exam period

Online Quizzes

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 8 hours

Due: **see assignment information below**

Weighting: **35%**

Eight quizzes, including also a midsemester test, will be undertaken throughout the semester

On successful completion you will be able to:

- Explain how the cardiovascular, renal and respiratory systems contribute to the maintenance of homeostasis
- Relate specific structural features of organs to essential system functions
- Interpret physiological processes using equations of physical, chemical, and electrical

properties

- Identify situations in which organ systems interact to produce a co-ordinated response

Practical class assignments

Assessment Type ¹: Lab report

Indicative Time on Task ²: 15 hours

Due: **see assignment information below**

Weighting: **15%**

This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)

There are three assignments based on three practical classes. These are to be completed in the week following the practical, and submitted to Turnitin.

On successful completion you will be able to:

- Explain how the cardiovascular, renal and respiratory systems contribute to the maintenance of homeostasis
- Interpret physiological processes using equations of physical, chemical, and electrical properties
- Analyse data, and synthesise and communicate the implications of experimental results
- Perform experiments safely with human subjects and accurately collect data, demonstrating adherence to Macquarie University Human Research Ethics Committee sanctioned protocols
- Identify situations in which organ systems interact to produce a co-ordinated response

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 3 hours

Due: **scheduled in exam period**

Weighting: **50%**

The final exam will be held in the formal examination period, and will be based on all lecture and practical material.

On successful completion you will be able to:

- Explain how the cardiovascular, renal and respiratory systems contribute to the maintenance of homeostasis
- Relate specific structural features of organs to essential system functions
- Interpret physiological processes using equations of physical, chemical, and electrical properties
- Analyse data, and synthesise and communicate the implications of experimental results
- Identify situations in which organ systems interact to produce a co-ordinated response

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Lectures and practicals

There will be two lectures each week. Because of the need for social distancing there can sadly be no on-campus lectures for Systems Physiology this semester. Each week's lectures will be made available through ECHO on the iLearn site by 10am Monday at the start of each week of semester.

For external students practical classes will be offered as blocks in weeks 4 and 9 of the semester. These will also operate remotely and be accessible online. When you enroll in the unit you will be assigned to your blocked sessions for your practical class. Zoom links will be sent to your for your practical and it is important that you attend the online practical in your allotted time so that we can balance the student load across the classes.

You will find online lectures in ECHO on an "Introduction to Neurophysiology" and the "Autonomic Nervous System". The background information contained in these lectures is required for understanding of concepts introduced in BIOL2220 so it is essential that all students who have not completed BIOL257 study these lectures in week one. These lectures will also be a helpful revision tool for students who have completed BIOL257.

Unit Material and Textbooks

The textbook for this unit is "Principals of Human Physiology" by Cindy L Stanfield, published by Pearson. You can subscribe to the new digital version (6th addition) at

<http://www.pearson.com.au/9781292156491>

and you do not need MyLab/Mastering.

iLearn

Your iLearn site will contain everything you need for this course, including discussion forums and class announcements. You should check this site regularly. You should also check your university email regularly for important announcements.

Past exam papers, and the final exam in 2020

Because of the need for social distancing, this year the final exam will run online and will be open-book, meaning you will be able to use your notes. To help you prepare for the final exam you may wish to look at past exam papers. These can be accessed from the library using this link.

https://multisearch.mq.edu.au/primo-explore/search?search_scope=Past%20Exam%20Papers&vid=MQ&query=any,contains,BIOL247

Note that the structure of the exam in 2020 will be similar to, but not identical to previous years.

Unit Schedule

Lecture schedule 2020

Week	Lecture topics
1	1. Overview of the cardiovascular system. 2. Electrical activity of the heart.
2	3. Generation of the heartbeat. 4. Regulation of contraction of cardiac muscle.
3	5. Physics of the circulation. 6. Components of the circulation and their specific functions.
4	7. Function of the microcirculation/control of blood flow. 8. Regulation of cardiac output.
5	9. Short term regulation of arterial blood pressure. 10. Structure and function of the renal system.
6	11. Production of urine by the nephron. 12. Excretion as the outcome of filtration, reabsorption and secretion.
7	13. Water balance: the control of ECF osmolarity. 14. Sodium balance: the control of ECF volume and blood pressure.
	Study break
8	15. Structure and function of the respiratory system. 16. The process of breathing.
9	17. Alveolar ventilation and perfusion. 18. Gas exchange
10	19. Control of respiration. 20. Nutrition
11	21. Function and organisation of the gastrointestinal system. 22. Motility of the gastrointestinal system
12	23. Secretion in the gastrointestinal system. 24. Digestion and absorption of food.
13	25. Catch up and revision

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Students seeking more policy resources can visit the [Student Policy Gateway \(https://students.mq.edu.au/support/study/student-policy-gateway\)](https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.