



BIOL2220

Systems Physiology

Session 2, In person-scheduled-infrequent, North Ryde 2022

School of Natural Sciences

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General Information

Unit convenor and teaching staff

Unit Convenor

Emily Don

emily.don@mq.edu.au

Contact via 98506284

Room 203, 6 Science Road

Monday 1-2pm

Tarun Rajan

tarun.rajan@mq.edu.au

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 or PSYU1101) and (PSYU1105 or PSYC105 or PSYU1102)) 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 system and the 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

Online quizzes

All eight quizzes are in the form of multiple choice questions and will be available on iLearn. 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.

Practical classes and assignments

Practical classes will run on campus only. You will find detailed information concerning online and on-campus sessions (for internals and externals) on iLearn. You will be assigned a practical time slot 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. The practical classes and assessments are a hurdle for BIOL2220. 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 2022 is that you must complete and submit all three practical assignments.

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 the due dates (or else late penalties will apply if no special considerations has been approved). 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.

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.

Final Exam Late Assessment Submission Penalty

From 1 July 2022, Students enrolled in Session based units with written assessments will have the following university standard late penalty applied. Please see <https://students.mq.edu.au/study/assessment-exams/assessments> for more information. Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark) will be applied each day a written assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. Submission time for all written assessments is set at 11:55 pm. A 1-hour grace period is provided to students who experience a technical concern. For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, students need to submit an application for Special Consideration.

Assessments where Late Submissions will be accepted

In this unit, late submissions will accepted as follows:

AT1 Quizzes - YES, Standard Late Penalty applies

AT2 Practical assessments - YES, Standard Late Penalty applies

AT3 Mid-semester Test - NO, unless Special Consideration is Granted

AT4 Final - NO, unless Special Consideration is Granted

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Eight online quizzes</u>	20%	No	Weekly
<u>Practical class assignments</u>	15%	Yes	Weeks 5 & 9
<u>Mid-semester test</u>	15%	No	Session break
<u>Final Exam</u>	50%	No	Exam period

Eight online quizzes

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 8 hours

Due: **Weekly**

Weighting: **20%**

A number of online quizzes 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
- Analyse data, and synthesise and communicate the implications of experimental results

Practical class assignments

Assessment Type ¹: Lab report

Indicative Time on Task ²: 16 hours

Due: **Weeks 5 & 9**

Weighting: **15%**

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

There are three assignments based on practical classes. These are to be completed in the week following the practical, and submitted to Turnitin. This is a hurdle and students have to submit all three assignments to be able to pass the unit.

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

Mid-semester test

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 3 hours

Due: **Session break**

Weighting: **15%**

a mid-semester test will be undertaken online before the mid-semester break.

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

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 3 hours

Due: **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

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.

Lectures and practicals

There will be two lectures each week. Pre-recorded lectures will be made available via iLearn and there will be optional on-campus viewings.

Practical classes begin in week two. These will operate in-person, on campus. Practical classes run for a maximum of 3 hours. When you enroll in the unit you will be assigned to one of the practical classes. We ask that you attend the online practical in your allotted time so that we can balance the student load across the classes. Please contact the Unit Convenor if your allocation will cause undue hardship or unavoidable timetable clashes.

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.

Past exam papers, and the final exam in 2022

The final exam will take place on-campus unless further instructions are given that it should run online. 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 2022 will be similar to, but not identical to previous years.

Unit Schedule

Lecture schedule 2022

Week	Lecture topics
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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 \(https://policies.mq.edu.au\)](https://policies.mq.edu.au). 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](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

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

To find other policies relating to Teaching and Learning, visit [Policy Central](https://policies.mq.edu.au) (<https://policies.mq.edu.au>) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/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

Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

Student Support

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

The Writing Centre

[The Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)

- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the 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

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)

Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

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.