

# **BIOL2220**

# **Systems Physiology**

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

School of Natural Sciences

# Contents

General Information	2
Learning Outcomes	2
General Assessment Information	3
Assessment Tasks	4
Delivery and Resources	7
Unit Schedule	7
Policies and Procedures	8

#### Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

# **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 <a href="https://www.mq.edu.au/study/calendar-of-dates">https://www.mq.edu.au/study/calendar-of-dates</a>

# **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
Eight online quizzes	20%	No	Weekly
Practical class assignments	15%	Yes	Weeks 4, 5 & 12
Mid-semester test	15%	No	Week 7
Final Exam	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 <sup>1</sup>: Lab report Indicative Time on Task <sup>2</sup>: 16 hours Due: Weeks 4, 5 & 12 Weighting: 15% This is a hurdle assessment task (see <u>assessment policy</u> 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: **Week 7** 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

<sup>1</sup> 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.

<sup>2</sup> 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%20Paper s&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 2021

Week Lecture topics

https://unitguides.mq.edu.au/unit\_offerings/149177/unit\_guide/print 7

#### Unit guide BIOL2220 Systems Physiology

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

# **Policies and Procedures**

Macquarie University policies and procedures are accessible from <u>Policy Central</u> (<u>https://policies.mq.edu.au</u>). 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 <u>Student Policies</u> (<u>https://students.mq.edu.au/su</u> <u>pport/study/policies</u>). 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 <u>Policy Central</u> (<u>https://policies.mq.e</u> <u>du.au</u>) and use the <u>search tool</u>.

#### **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 <u>eStudent</u>, (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 <u>eStudent</u>. For more information visit <u>ask.mq.edu.au</u> or if you are a Global MBA student contact globalmba.support@mq.edu.au

# Academic Integrity

At Macquarie, we believe <u>academic integrity</u> – 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 <u>online writing an</u> d maths support, academic skills development and wellbeing consultations.

# Student Support

Macquarie University provides a range of support services for students. For details, visit <u>http://stu</u> dents.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 <u>http://www.mq.edu.au/about\_us/</u>offices\_and\_units/information\_technology/help/.

When using the University's IT, you must adhere to the <u>Acceptable Use of IT Resources Policy</u>. The policy applies to all who connect to the MQ network including students.