



ECHO11004 Biochemistry for Cardiac Pharmacology

Term 2 - 2023

Profile information current as at 20/04/2024 12:47 am

All details in this unit profile for ECHO11004 have been officially approved by CQUUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

Overview

This unit will enable you to develop knowledge and understanding of biomolecules, cell function and cellular biochemistry. You will develop a basic understanding of how biomolecules are synthesised, catabolised and interconverted through key biochemical pathways to meet the needs of the cell and organism. Cellular biochemistry will explore aspects of cell-cell communication to provide the necessary knowledge to study disease and drug treatment at the cellular level. This unit will prepare you for advanced level study of cardiovascular pharmacology.

Details

Career Level: *Undergraduate*

Unit Level: *Level 1*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Pre-requisite: ECHO11003 Fundamentals of Cardiac Science AND Co-requisite BMSC11002 Human Body Systems 2 OR BMSC11011 Human Anatomy and Physiology 2

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

Offerings For Term 2 - 2023

- Online

Attendance Requirements

All on-campus students are expected to attend scheduled classes - in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

[Regional Campuses](#)

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

[Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. **Online Quiz(zes)**

Weighting: 40%

2. **Online Test**

Weighting: 60%

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the [CQUniversity Policy site](#).

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

Previous Student Feedback

Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

Feedback from Unit coordinator reflection

Feedback

Revision resources are underutilised and students may benefit from more frequent engagement with the unit material.

Recommendation

Investigate ways to encourage more student engagement and interaction with the unit resources.

Feedback from Student feedback via email

Feedback

Students appreciate the personalised feedback provided to them for each online quiz.

Recommendation

Continue to provide students with constructive, personalised feedback for each online quiz.

Feedback from Unit coordinator reflection

Feedback

Additional real-world examples could be provided in the unit material to cultivate more interest in the subject.

Recommendation

Invest in the provision of additional real-world examples to the lecture, unit reading materials and tutorials.

Unit Learning Outcomes

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

1. Describe the structure, function and biological roles of the major types of biomolecules and macromolecules
2. Describe the relationship between structure and function of the components of biological membranes, especially in terms of selective permeability
3. Outline the basic processes involved in metabolic and catabolic pathways relevant to the cardiovascular system
4. Describe basic cell signalling, communication and metabolism.

Linked to National and International Standards

1. ASAR Accreditation Standards for Cardiac Sonography - critical practice Unit 8 - Cardiac, Foundation units of competence - 1- 5.
2. European Association of Cardiovascular Imaging Core Syllabus
3. American Registry for Cardiac Sonography Core Syllabus

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
1 - Online Quiz(zes) - 40%	•	•	•	•
2 - Online Test - 60%	•	•	•	•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
1 - Communication	•	•	•	•
2 - Problem Solving	•	•	•	•
3 - Critical Thinking	•	•	•	•
4 - Information Literacy	•	•	•	•
5 - Team Work				
6 - Information Technology Competence				
7 - Cross Cultural Competence				
8 - Ethical practice				
9 - Social Innovation				
10 - Aboriginal and Torres Strait Islander Cultures				

Textbooks and Resources

Textbooks

There are no required textbooks.

Additional Textbook Information

All core readings for this unit are provided for free on the unit's Moodle site. If you would like additional readings, you may wish to purchase 'Medical Biochemistry' (complete details below). This textbook contains relevant information, but it is not used directly in ECHO11004, so purchasing it is completely optional.

Medical Biochemistry

Authors: Baynes and Dominiczak

6th Edition (2022)

ISBN: 9780323834506

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)

Referencing Style

All submissions for this unit must use the referencing style: [Vancouver](#)
For further information, see the Assessment Tasks.

Teaching Contacts

Jordon Irwin Unit Coordinator
j.irwin@cqu.edu.au

Schedule

Week 1 - 10 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Module 1 Carbohydrates 'Cardiac-link' discussion: cardiovascular complications associated with hyperglycaemia	'Carbohydrates' in the Biochemistry Handbook (available on Moodle)	Tutorial on Unit Overview

Week 2 - 17 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Module 2 Proteins 'Cardiac-link' discussion: the quaternary structure of haemoglobin	'Proteins' in the Biochemistry Handbook (available on Moodle)	Tutorial on Carbohydrates

Week 3 - 24 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
Module 3 Nucleic acids 'Cardiac-link' discussion: genetic mutations in Fabry's disease	'Nucleic acids' in the Biochemistry Handbook (available on Moodle)	Tutorial on Proteins

Week 4 - 31 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
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Module 4 | Lipids

'Cardiac-link' discussion: prostaglandins in cardiovascular disease

'Lipids' in the Biochemistry Handbook (available on Moodle)

Tutorial on Nucleic acids

Week 5 - 07 Aug 2023**Module/Topic****Chapter****Events and Submissions/Topic****Module 5 | Cell membranes**

'Cardiac-link' discussion: spectrin dysfunction in cardiovascular disease

'Cell membranes' in the Biochemistry Handbook (available on Moodle)

Tutorial on Lipids
Online Quiz 1 Opens: Week 5 Friday (11 Aug 2023) 12:01 am AEST

Vacation Week - 14 Aug 2023**Module/Topic****Chapter****Events and Submissions/Topic****Vacation Week | Catch-up, Assessment preparation, Revision**

Online Quiz 1 Due: Vacation Week Monday (14 Aug 2023) 9:00 am AEST

Week 6 - 21 Aug 2023**Module/Topic****Chapter****Events and Submissions/Topic****Module 6 | Cell transport**

'Cardiac-link' discussion: SGLT2 inhibitors and diabetes mellitus

'Cell transport' in the Biochemistry Handbook (available on Moodle)

Tutorial on Cell membranes

Week 7 - 28 Aug 2023**Module/Topic****Chapter****Events and Submissions/Topic****Module 7 | Metabolism I**

'Cardiac-link' discussion: creatine kinase isozymes as biomarkers of myocardial infarction

'Metabolism I' in the Biochemistry Handbook (available on Moodle)

Tutorial on Cell transport
Online Quiz 2 Opens: Week 7 Friday (01 Sept 2023) 12:01 am AEST

Week 8 - 04 Sep 2023**Module/Topic****Chapter****Events and Submissions/Topic****Module 8 | Metabolism II**

'Cardiac-link' discussion: the role of carbohydrates in obesity

'Metabolism II' in the Biochemistry Handbook (available on Moodle)

Tutorial on Metabolism I
Online Quiz 2 Due: Week 8 Monday (4 Sept 2023) 9:00 am AEST

Week 9 - 11 Sep 2023**Module/Topic****Chapter****Events and Submissions/Topic****Module 9 | Metabolic Regulation**

'Cardiac-link' discussion: metabolic profile of the myocardium during left ventricular hypertrophy

'Metabolic Regulation' in the Biochemistry Handbook (available on Moodle)

Tutorial on Metabolism II

Week 10 - 18 Sep 2023**Module/Topic****Chapter****Events and Submissions/Topic****Module 10 | Cell communication**

'Cardiac-link' discussion: paracrine factors in cardiovascular disease

'Cell communication' in the Biochemistry Handbook (available on Moodle)

Tutorial on Metabolic Regulation
Online Quiz 3 Opens: Week 10 Friday (22 Sept 2023) 12:01 am

Week 11 - 25 Sep 2023**Module/Topic****Chapter****Events and Submissions/Topic****Module 11 | Introduction to Pharmacology**

'Cardiac-link' discussion: cardiovascular drugs

'Introduction to Pharmacology' Extension Chapter (available on Moodle)

Tutorial on Cell communication
Online Quiz 3 Due: Week 11 Monday (25 Sept 2023) 9:00 am AEST

Week 12 - 02 Oct 2023**Module/Topic****Chapter****Events and Submissions/Topic****Revision**

Tutorial on Introduction to Pharmacology + Revision
Online Quiz 4 Opens: Week 12 Friday (6 Oct 2023) 12:01 am AEST

Review/Exam Week - 09 Oct 2023

Module/Topic	Chapter	Events and Submissions/Topic
Revision		Online Quiz 4 Due: Review/Exam Week Monday (9 Oct 2023) 9:00 am AEST
		Online Test Opens: Review/Exam Week Wednesday (11 Oct 2023) 12:01 am AEST
		Online Test Due: Review/Exam Week Friday (13 Oct 2023) 11:59 pm AEST

Term Specific Information

Contact details for Teaching Staff

The unit coordinator for ECHO11004, Jordon Irwin, can be reached via email (j.irwin@cqu.edu.au), phone (07 4923 2550) and the Q&A forum on Moodle.

Lectures and Tutorials

All lectures for this unit are pre-recorded and available on the unit's Moodle site. Live tutorials are delivered weekly on Zoom, but they are also recorded and made available for later viewing on the Moodle site.

Readings in this Unit

All readings for this unit come from the unit-specific Biochemistry Handbook which is available on the Moodle site. If you would like additional readings, you are welcome to purchase the supplementary textbook: Medicinal Biochemistry by Baynes and Dominiczak. This textbook, however, is not directly used in the unit, so purchasing it is completely optional. All the resources that you will need to succeed in ECHO11004 are available for free on the Moodle site.

Unit Study Commitment

As per Australian education standards, this unit has a Study Commitment of 150 hours total engagement for the term. A suggestion for how you should allocate your weekly study commitment for ECHO11004 is as follows:

- 2-3 hours watching recorded lectures and attending/viewing the tutorial.
- 1-2 hours completing the recommended readings.
- 2-3 hours completing the weekly study questions and practice assessment activities.
- 3-4 hours revising for the Online Quizzes and Online Test.

Assessment Tasks

1 Online Quizzes

Assessment Type

Online Quiz(zes)

Task Description

A sound knowledge of biochemistry is essential for understanding cardiac physiology and cardiac pharmacology. Throughout the term, you will complete four Online Quizzes which will evaluate your understanding of fundamental biochemistry concepts (as covered in this unit). The Online Quizzes will also prompt you to revise the content during the term and will thus aid your preparation for the end-of-term Online Test.

You will be permitted only one (1) attempt for each quiz, and your combined score for these quizzes will contribute 40% to your final grade. No collusion, AI chatbot or teamwork is permitted when completing these quizzes.

The dates and times for each quiz are outlined below (all times shown are AEST):

- Quiz 1 will open at 12:01 am on Friday 11th August 2023 (Week 5) and will remain open until 9:00 am on Monday 14th August 2023 (Vacation Week). This quiz will assess the topics covered during Weeks 1 to 4 i.e., macromolecules.
- Quiz 2 will open at 12:01 am on Friday 1st September 2023 (Week 7) and will remain open until 9:00 am on Monday 4th September 2023 (Week 8). This quiz will assess the topics covered during Weeks 5 to 6 i.e., cell transport.
- Quiz 3 will open at 12:01 am on Friday 22nd September 2023 (Week 10) and will remain open until 9:00 am on Monday 25th September 2023 (Week 11). This quiz will assess the topics covered during Weeks 7 to 9 i.e., metabolism.
- Quiz 4 will open at 12:01 am on Friday 6th October 2023 (Week 12) and will remain open until 9:00 am on

Monday 9th October 2023 (Review/Exam Week). This quiz will assess the topics covered during Weeks 10 to 11 i.e., cell communication and introductory pharmacology.

Number of Quizzes

4

Frequency of Quizzes

Other

Assessment Due Date

The due dates and times for each quiz are listed in the Task Description.

Return Date to Students

The quizzes will be graded automatically, but additional feedback will be returned via Moodle within one (1) week of submission.

Weighting

40%

Minimum mark or grade

50%

Assessment Criteria

Marks will be awarded for correct responses.

Referencing Style

- [Vancouver](#)

Submission

Online

Submission Instructions

The quizzes will be accessed and completed individually via Moodle.

Learning Outcomes Assessed

- Describe the structure, function and biological roles of the major types of biomolecules and macromolecules
- Describe the relationship between structure and function of the components of biological membranes, especially in terms of selective permeability
- Outline the basic processes involved in metabolic and catabolic pathways relevant to the cardiovascular system
- Describe basic cell signalling, communication and metabolism.

2 Online Test

Assessment Type

Online Test

Task Description

At the end of the term, you will complete an Online Test which will evaluate your knowledge of the topics covered in this unit (Weeks 1-11 inclusive).

You will be permitted only one (1) attempt for this assessment task, and your score from the Online Test will contribute 60% to your final grade. No collusion, AI chatbot or teamwork is permitted when completing the Online Test.

The dates and times for the Online Test are outlined below (all times shown are AEST):

- The Online Test will open at 12:01 am on Wednesday 11th October 2023 (Review/Exam Week) and will remain open until 11:59 pm on Friday 13th October 2023 (Week 13). This test will assess the topics covered during Weeks 1 to 11 i.e., all weeks of content.

Assessment Due Date

Review/Exam Week Friday (13 Oct 2023) 11:59 pm AEST

The Test will end once you click submit or when the time limit has been exhausted.

Return Date to Students

Exam Week Friday (20 Oct 2023)

This Test will be manually graded, and the results returned via Moodle within two (2) weeks of submission.

Weighting

60%

Minimum mark or grade

50%

Assessment Criteria

Marks will be awarded for correct responses.

Referencing Style

- [Vancouver](#)

Submission

Online

Submission Instructions

The Test will be accessed and completed individually via Moodle.

Learning Outcomes Assessed

- Describe the structure, function and biological roles of the major types of biomolecules and macromolecules
- Describe the relationship between structure and function of the components of biological membranes, especially in terms of selective permeability
- Outline the basic processes involved in metabolic and catabolic pathways relevant to the cardiovascular system
- Describe basic cell signalling, communication and metabolism.

Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

What can you do to act with integrity?



Be Honest

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own



Seek Help

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)



Produce Original Work

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem