



BMSC11005 Foundations of Biochemistry

Term 2 - 2019

Profile information current as at 18/04/2024 03:37 am

All details in this unit profile for BMSC11005 have been officially approved by CQUniversity 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 students to develop their knowledge and understanding of biomolecules and cell function, including the structure and biological role of amino acids, proteins, nucleic acids, carbohydrates and lipids. They will develop a basic understanding of how these biomolecules are synthesised, catabolised and interconverted through key biochemical pathways to meet the needs of the cell and organism, and will provide the necessary knowledge to begin to study disease and drug treatment at the cellular level. Students will also develop a theoretical understanding of methods used in biochemical analysis and develop literature searching skills in the recognition and use of primary sources of scientific information.

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

Prerequisites: CHEM11041 Chemistry for the Life Sciences or CHEM11042 Fundamentals of Chemistry or CHEM11043 Atoms, Molecules and Matter

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 - 2019

- Brisbane
- Bundaberg
- Cairns
- Mackay
- Melbourne
- Online
- Rockhampton
- Sydney
- Townsville

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. Written Assessment

Weighting: 20%

2. Online Quiz(zes)

Weighting: 40%

3. Examination

Weighting: 40%

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 and teaching team

Feedback

Student attendance at on-campus tutorials has declined this year, which places an increased demand on online engagement with students in this unit.

Recommendation

Investigate the implementation of online student support services, such as the PASS program.

Feedback from Student Feedback

Feedback

Students enjoyed the content of the unit and appreciated the application of biochemistry in clinically-relevant contexts.

Recommendation

Continue with the delivery of biochemistry content with a focus on clinically-relevant application of this knowledge.

Unit Learning Outcomes

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

1. Demonstrate knowledge of the structure, function and biological roles of the major types of macromolecules and their building blocks
2. Explain the various methods used to separate and characterise macromolecules
3. Describe the relationship between structure and function of the components of biological membranes
4. Outline the basic processes involved in metabolism of carbohydrates, fats and proteins and their catabolism to synthesise ATP through cellular respiration
5. Demonstrate an ability to undertake research in the biological sciences.

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
1 - Written Assessment - 20%					•
2 - Online Quiz(zes) - 40%	•	•	•	•	
3 - Examination - 40%	•	•	•	•	

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
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					

Alignment of Assessment Tasks to Graduate Attributes

Textbooks and Resources

Textbooks

BMSC11005

Prescribed

General, Organic and Biological Chemistry

4th edition (2018)

Authors: Smith, JG

McGraw Hill

New York , NY , USA

Binding: Hardcover

Additional Textbook Information

Paper copies can be purchased from the CQUni Bookshop here: <http://bookshop.cqu.edu.au> (search on the Unit code)

[View textbooks at the CQUniversity Bookshop](#)

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 styles below:

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)
- [Harvard \(author-date\)](#)

For further information, see the Assessment Tasks.

Teaching Contacts

Corine Ting Unit Coordinator

c.ting@cqu.edu.au

Paul Neilsen Unit Coordinator

p.neilsen@cqu.edu.au

Schedule

Week 1 - 15 Jul 2019

Module/Topic	Chapter	Events and Submissions/Topic
Cell structure and pH regulation		ISL Tutorial: Friday 1pm-2pm AEST Rockhampton North 32/G.17 Brisbane 01/4.09 Bundaberg 01/1.05 Cairns 01/3.27 Mackay Ooralea 20/G.11 Sydney 02/2.12 Townsville 02/2.14

Week 2 - 22 Jul 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Amino acids and proteins	Chapter 21 General, Organic and Biological Chemistry (J.G. Smith, 4th Edition)	ISL Tutorial: Friday 1pm-2pm AEST Rockhampton North 32/G.17 Brisbane 01/4.09 Bundaberg 01/1.05 Cairns 01/3.27 Mackay Ooralea 20/G.11 Sydney 02/2.12 Townsville 02/2.14
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Week 3 - 29 Jul 2019

Module/Topic	Chapter	Events and Submissions/Topic
Enzymes and enzyme kinetics	Chapter 21 General, Organic and Biological Chemistry (J.G. Smith, 4th Edition)	ISL Tutorial: Friday 1pm-2pm AEST Rockhampton North 32/G.17 Brisbane 01/4.09 Bundaberg 01/1.05 Cairns 01/3.27 Mackay Ooralea 20/G.11 Sydney 02/2.12 Townsville 02/2.14

Week 4 - 05 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Nucleic acids and protein synthesis	Chapter 22 General, Organic and Biological Chemistry (J.G. Smith, 4th Edition)	ISL Tutorial: Friday 1pm-2pm AEST Rockhampton North 32/G.17 Brisbane 01/4.09 Bundaberg 01/1.05 Cairns 01/3.27 Mackay Ooralea 20/G.11 Sydney 02/2.12 Townsville 02/2.14

Week 5 - 12 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Carbohydrates	Chapter 20 General, Organic and Biological Chemistry (J.G. Smith, 4th Edition)	ISL Tutorial: Friday 1pm-2pm AEST Rockhampton North 32/G.17 Brisbane 01/4.09 Bundaberg 01/1.05 Cairns 01/3.27 Mackay Ooralea 20/G.11 Sydney 02/2.12 Townsville 02/2.14

Protein Poster Due: Week 5 Friday (16 Aug 2019) 11:59 pm AEST

Vacation Week - 19 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 26 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
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Lipids

Chapter 19
General, Organic and Biological Chemistry (J.G. Smith, 4th Edition)

ISL Tutorial: Friday 1pm-2pm AEST

Rockhampton North 32/G.17

Brisbane 01/4.09

Bundaberg 01/1.05

Cairns 01/3.27

Mackay Ooralea 20/G.11

Sydney 02/2.12

Townsville 02/2.14

Assessment 2 Online Quiz 1 opens at Week 6 Friday at 5:00pm (AEST). This will assess topics covered during Weeks 1 to 6

Week 7 - 02 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Metabolism and ATP synthesis	Chapter 23 General, Organic and Biological Chemistry (J.G. Smith, 4th Edition)	ISL Tutorial: Friday 1pm-2pm AEST Rockhampton North 32/G.17 Brisbane 01/4.09 Bundaberg 01/1.05 Cairns 01/3.27 Mackay Ooralea 20/G.11 Sydney 02/2.12 Townsville 02/2.14

Week 8 - 09 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Metabolism of carbohydrates, fatty acids and proteins	Chapter 24 General, Organic and Biological Chemistry (J.G. Smith, 4th Edition)	ISL Tutorial: Friday 1pm-2pm AEST Rockhampton North 32/G.17 Brisbane 01/4.09 Bundaberg 01/1.05 Cairns 01/3.27 Mackay Ooralea 20/G.11 Sydney 02/2.12 Townsville 02/2.14

Week 9 - 16 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Transport across the cell membrane	Chapter 19 General, Organic and Biological Chemistry (J.G. Smith, 4th Edition)	ISL Tutorial: Friday 1pm-2pm AEST Rockhampton North 32/G.17 Brisbane 01/4.09 Bundaberg 01/1.05 Cairns 01/3.27 Mackay Ooralea 20/G.11 Sydney 02/2.12 Townsville 02/2.14

Week 10 - 23 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Chemical messengers - amines and neurotransmitters	Chapter 18 General, Organic and Biological Chemistry (J.G. Smith, 4th Edition)	ISL Tutorial: Friday 1pm-2pm AEST Rockhampton North 32/G.17 Brisbane 01/4.09 Bundaberg 01/1.05 Cairns 01/3.27 Mackay Ooralea 20/G.11 Sydney 02/2.12 Townsville 02/2.14 Assessment 2 Online Quiz 2 opens Week 10 Friday at 5:00pm (AEST). This will assess topics covered during Weeks 7 to 10

Week 11 - 30 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Focus videos to revisit essential biochemical pathways and processes		ISL Tutorial: Friday 1pm-2pm AEST Rockhampton North 32/G.17 Brisbane 01/4.09 Bundaberg 01/1.05 Cairns 01/3.27 Mackay Ooralea 20/G.11 Sydney 02/2.12 Townsville 02/2.14

Week 12 - 07 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic
Exam revision		ISL Tutorial: Friday 1pm-2pm AEST Rockhampton North 32/G.17 Brisbane 01/4.09 Bundaberg 01/1.05 Cairns 01/3.27 Mackay Ooralea 20/G.11 Sydney 02/2.12 (2pm to 3pm due to daylight saving) Townsville 02/2.14

Review/Exam Week - 14 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic
		Online Quizzes Due: Review/Exam Week Friday (18 Oct 2019) 11:59 pm AEST

Exam Week - 21 Oct 2019

Module/Topic	Chapter	Events and Submissions/Topic

Term Specific Information

Your unit coordinator for BMSC11005 Foundations of Biochemistry is Corine Ting. You can contact me using the forum on the unit's Moodle site or alternatively through email (c.ting@cqu.edu.au) or on 0749309600. The forum for this unit is continuously monitored and you can expect a response within 24 hours of posting your question.

As the name suggests, this unit will provide you with foundation knowledge of biochemistry in relation to your profession. BMSC11005 Foundations of Biochemistry is a core unit in several courses, including:

- Bachelor of Paramedic Sciences
- Bachelor of Medical Sciences
- Bachelor of Medical Laboratory Science
- Bachelor of Sciences (Chiropractic)
- Bachelor of Science
- Bachelor of Environmental Science

You will be provided an opportunity to explore how biochemistry relates to your specific discipline in Assessment 1, whereby you will further your understanding of protein biology by selecting a protein to study that is relevant to your future profession. The broader relevance of biochemistry will be further exemplified through clinical examples provided throughout the lectures and tutorials.

All lectures are pre-recorded and students can access them anytime during the term. Tutorials are delivered each week from the Rockhampton campus and through ISL to campuses at Cairns, Townsville, Mackay, Bundaberg, Brisbane and Sydney. Students enrolled in distance delivery mode can also attend the live tutorials using ZOOM. During these tutorials, we will work through the weekly study questions that are provided to you on the Moodle site. These weekly study questions will help you apply knowledge learned during the weekly lecture and prepare you for the assessments. You will get the most benefit from the tutorials if you watch the weekly lectures beforehand and attempt the weekly study questions. You are strongly encouraged to participate in tutorials. Weekly revision quizzes are also provided to reinforce the knowledge you have gained from the lectures and to support your learning experience in this unit.

As per Australian educational standards, you are expected to commit 150 hours of engagement to your study of this unit. This is broken down as:

- 2 - 3 hours per week watching recorded lectures and revising the content through study notes
- 3 - 4 hours per week completing the weekly study questions and weekly revision quizzes on the unit's Moodle site
- 1 - 2 hours per week attending the weekly tutorial and reflecting on your answers to the weekly study questions
- 3 - 4 hours per week preparing your assessments or studying for your exam

Assessment Tasks

1 Protein Poster

Assessment Type

Written Assessment

Task Description

Proteins provide structure and function of our cells and tissues, and are fundamental to normal cellular homeostasis. In your future profession, you may encounter many proteins that have become dysfunctional and underpin the onset and development of various diseases or other medical conditions. This assessment provides you with an opportunity to perform an initial literature search to identify **one (1) protein** that is relevant to your future profession. Alternatively, a list of potential proteins and their relevance to the professions will be available on the unit's Moodle site and you may select one from this list. Your chosen protein will be the topic for your assessment, in which you will **produce a poster that provides information on the structure, function and biological role(s) of your selected protein**.

In order to achieve this you will need to:

- Identify a suitable protein that is of interest to you (either from the list provided on the Moodle site, or based on your interest and review of the literature). If you are unsure of the suitability of your choice for this assessment, please consult with the unit coordinator. A comprehensive explanation of the defining features of a protein is available through the learning materials provided during Week 2.
- Research the literature related to the structure and function of your chosen protein. Scientific journal articles should form the basis for this literature search.
- Prepare a poster written in your own words that summarises the structure, function and biological role(s) of the protein, with appropriate citation to your sources of literature. You are strongly encouraged to explore how the specific nature of a particular protein's structure dictates its biological function. Please provide details of any alterations that your protein may have in relation to a particular disease.

This assessment requires you to engage with relevant literature on your chosen protein and it is expected that you reference at least 5 scientific journal articles.

Assessment Due Date

Week 5 Friday (16 Aug 2019) 11:59 pm AEST

Return Date to Students

Week 7 Friday (6 Sept 2019)

Weighting

20%

Minimum mark or grade

This assessment has a minimum passing grade of 50% (which equates to a minimum mark of 50 out of 100)

Assessment Criteria

The poster will be evaluated in accordance with the detailed marking rubric available on the unit's Moodle site. A brief overview of the assessment criteria are as follows;

- 50 marks available for the scientific content that demonstrates a clear understanding of how the amino acids composition is related to the protein's structure and function. You must include information on the following:
 - Structure - primary, secondary, tertiary, and quaternary (if the protein has a quaternary structure)
 - Function of the protein and how it achieves this (what specifics about the structure allow the protein to carry out its function?)
 - Other relevant information - in particular possible disease/s associated with the protein and how modifications to the structure and function may be altered in the disease. This may be expanded upon to be made relevant in the context of your specific course and career pathway.
- 20 marks available for your research on the protein - you should have used at least 5 scientific references (ideally scientific journal articles or government websites with robust information)
- 10 marks available for organisation of the poster - The content of the poster should be organised into defined sections. All posters should have a clear title with the author's name and unit code. Headings should clearly identify the information contained within the section.
- 10 marks available for the appropriate use of references and formatting of the reference list.
- 10 marks available for presentation style / visual effectiveness of the poster, spelling, grammar, sentence structure and punctuation.

The total maximum grade for the protein poster is 100 marks. You are encouraged to closely consult the marking rubric whilst preparing your poster.

Referencing Style

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)
- [Harvard \(author-date\)](#)

Submission

Online

Learning Outcomes Assessed

- Demonstrate an ability to undertake research in the biological sciences.

Graduate Attributes

- Communication
- Problem Solving
- Information Literacy
- Information Technology Competence

2 Online Quizzes

Assessment Type

Online Quiz(zes)

Task Description

This unit will enable you to further develop your knowledge and understanding of biomolecules and cell function, including the structure and biological role of amino acids, proteins, nucleic acids, carbohydrates and lipids. This particular assessment requires you to demonstrate this knowledge and understanding of the content in this unit. Biomolecules will have a role in your future profession, hence it is important that you understand the roles that they play in the cells or tissues and how they are synthesised, catabolised and interconverted through key biochemical pathways. The intent of this assessment is to provide you with an opportunity to assess your understanding of this knowledge. You

are required to complete **two (2) online quizzes**.

- Each quiz will be comprised of 20 multiple choice questions
- Each question is worth 1 mark.
- Your time limit for each quiz is 30 minutes.
- The quiz will automatically submit at the completion of the 30 minute duration.
- You will be allowed one attempt at each quiz.

Your score from the quizzes will contribute 40% to your final grade (2 quizzes X 20% each = 40%). You will only be able to access and complete Quiz 2 after you have attempted Quiz 1.

- Quiz 1 will assess the topics covered during Weeks 1 to 6.
- Quiz 2 will assess the topics covered during Weeks 7 to 10.

Number of Quizzes

2

Frequency of Quizzes

Other

Assessment Due Date

Review/Exam Week Friday (18 Oct 2019) 11:59 pm AEST

Please see the timeline outlined above for specific information about quiz opening times and due dates.

Return Date to Students

Review/Exam Week Friday (18 Oct 2019)

Students will receive their correct answers on completion of the quiz.

Weighting

40%

Minimum mark or grade

This assessment has a minimum passing grade of 50% (for both online quizzes combined), which equates to a minimum mark of 20 out of 40.

Assessment Criteria

The questions will be automatically marked upon submission of your quiz. You will receive your grade at the completion of your quiz, and correct answers to each individual quiz questions will be available after the due date of the quiz (Friday of Week 12).

Referencing Style

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)
- [Harvard \(author-date\)](#)

Submission

Online

Learning Outcomes Assessed

- Demonstrate knowledge of the structure, function and biological roles of the major types of macromolecules and their building blocks
- Explain the various methods used to separate and characterise macromolecules
- Describe the relationship between structure and function of the components of biological membranes
- Outline the basic processes involved in metabolism of carbohydrates, fats and proteins and their catabolism to synthesise ATP through cellular respiration

Graduate Attributes

- Problem Solving
- Information Literacy

Examination

Outline

Complete an invigilated examination.

Date

During the examination period at a CQUniversity examination centre.

Weighting

40%

Length

180 minutes

Minimum mark or grade

50%

Exam Conditions

Closed Book.

Materials

Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).
No calculators permitted

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