



# LMED28001 Chemical Pathology 1

## Term 1 - 2023

Profile information current as at 02/05/2024 01:22 pm

All details in this unit profile for LMED28001 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

On completion of this unit, you will be able to evaluate the evidence base for biochemical tests used in the diagnosis and monitoring of diseases in the major organ systems of the body. Problem-solving and decision making skills will be developed through the use of authentic case studies. Skill development in instrument calibration, best practice measurement, interpretation of test results and test quality control monitoring will occur through practical exercises. You will be required to attend a residential school on the Rockhampton campus in order to promote the development of unit learning outcomes. The residential school may be scheduled outside of the term of offering of the unit.

#### Details

Career Level: *Postgraduate*

Unit Level: *Level 8*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

#### Pre-requisites or Co-requisites

Prerequisite Enrolment in Master of Laboratory Medicine.

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 1 - 2023

- Melbourne
- Mixed Mode
- Rockhampton

#### 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).

#### Residential Schools

This unit has a Compulsory Residential School for distance mode students and the details are:

Click here to see your [Residential School Timetable](#).

#### 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 Postgraduate 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. **Written Assessment**

Weighting: 30%

#### 3. **Laboratory/Practical**

Weighting: Pass/Fail

#### 4. **Examination**

Weighting: 50%

### 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](#).

## Unit Learning Outcomes

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

1. Explain the various processes involved in biochemical method evaluation, interpretation and development
2. Appraise the limitations of laboratory procedures and regulatory aspects including external quality assurance and accreditation bodies
3. Describe the rationale and clinical correlation of specialised biochemical tests used in the detection and monitoring of processes affecting the major organ systems
4. Demonstrate skills in the use of biochemical instrumentation including corrective action as required
5. Evaluate biochemical clinical cases to derive a provisional diagnosis.

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
<b>1 - Written Assessment - 20%</b>			•		
<b>2 - Written Assessment - 30%</b>		•		•	•
<b>3 - Laboratory/Practical - 0%</b>				•	
<b>4 - Examination - 50%</b>	•	•	•		•

### Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
<b>1 - Knowledge</b>	◦	◦	◦	◦	◦
<b>2 - Communication</b>		◦	◦	◦	◦
<b>3 - Cognitive, technical and creative skills</b>	◦	◦	◦	◦	◦
<b>4 - Research</b>					
<b>5 - Self-management</b>					
<b>6 - Ethical and Professional Responsibility</b>				◦	
<b>7 - Leadership</b>					
<b>8 - Aboriginal and Torres Strait Islander Cultures</b>					

## Textbooks and Resources

### Textbooks

LMED28001

#### Prescribed

##### **Clinical Chemistry: Principles, Techniques, and Correlations**

Edition: Ninth (2023)

Authors: Michael L. Bishop, Edward P. Fody, Carleen Van Siclen, James March Mistler, Michelle Moy, Jones and Bartlett Learning  
Burlington, Mass, USA  
ISBN: 9781284238860  
Binding: Hardcover

#### Additional Textbook Information

The prescribed textbook can be accessed online at the CQUniversity Library website. Access may be limited. If you would prefer your own copy, purchase either paper or eBook versions at 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)
- Zoom (both microphone and webcam capability)

## Referencing Style

**All submissions for this unit must use the referencing styles below:**

- [Harvard \(author-date\)](#)
- [Vancouver](#)

For further information, see the Assessment Tasks.

## Teaching Contacts

**Genia Burchall** Unit Coordinator

[g.burchall@cqu.edu.au](mailto:g.burchall@cqu.edu.au)

**Amer Siddiq** Unit Coordinator

[a.siddiq@cqu.edu.au](mailto:a.siddiq@cqu.edu.au)

## Schedule

### Week 1 - 06 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
1. Analytical process, data interpretation and method evaluation 2. Quality Control and External Quality Assessment	1. Clinical Chemistry, Principles, Techniques and Correlations: 3 2. Clinical Chemistry, Principles, Techniques and Correlations: 3	Zoom tutorial - Introduction

### Week 2 - 13 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
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1. Analytical techniques 2. Automation and POCT	1. Clinical Chemistry, Principles, Techniques and Correlations: 4, 5, 2. Clinical Chemistry, Principles, Techniques and Correlations: 4, 5, 29	Zoom tutorial - covering Week 1
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### Week 3 - 20 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
pH, Buffering systems and Blood Gases	Clinical Chemistry, Principles, Techniques and Correlations: 12	Zoom tutorial - covering Week 2

### Week 4 - 27 Mar 2023

Module/Topic	Chapter	Events and Submissions/Topic
Renal Function	Clinical Chemistry, Principles, Techniques and Correlations: 11 & 21	Zoom tutorial - covering Week 3

### Week 5 - 03 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
Liver, Pancreas and Gastro Intestinal Tract	Clinical Chemistry, Principles, Techniques and Correlations: 19 & 22	Zoom tutorial - covering Week 4

### Vacation Week - 10 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
No lecture	N/A	No tutorial

### Week 6 - 17 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
1. Carbohydrates and Diabetes 2. Lipids	1. Clinical Chemistry, Principles, Techniques and Correlations: 9 2. Clinical Chemistry, Principles, Techniques and Correlations: 10	Zoom tutorial - covering Week 5  <b>Case Report</b> Due: Week 6 Monday (17 Apr 2023) 10:00 am AEST

### Week 7 - 24 Apr 2023

Module/Topic	Chapter	Events and Submissions/Topic
Endocrinology 1	Clinical Chemistry, Principles, Techniques and Correlations: 13, 14, 15, 16, 17	Zoom tutorial - covering Week 6

### Week 8 - 01 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
1. Endocrinology 2 2. Calcium and Bone	1. Clinical Chemistry, Principles, Techniques and Correlations: 13 - 18 2. Clinical Chemistry, Principles, Techniques and Correlations: 11, 18	Zoom tutorial - covering Week 7

### Week 9 - 08 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
Tumour Markers	Clinical Chemistry, Principles, Techniques and Correlations: 28	Zoom tutorial - covering Week 8

### Week 10 - 15 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
1. Pregnancy 2. Extremes of Age	1. Clinical Chemistry, Principles, Techniques and Correlations: 24 2. Clinical Chemistry, Principles, Techniques and Correlations: 30 & 31	Zoom tutorial - covering Week 9

### Week 11 - 22 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
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1. TDM and Toxicology
2. Nutritional Assessment

1. Clinical Chemistry, Principles, Techniques and Correlations: 25 & 26
2. Clinical Chemistry, Principles, Techniques and Correlations: 27

Zoom tutorial - covering Week 10

### Week 12 - 29 May 2023

Module/Topic	Chapter	Events and Submissions/Topic
REVISION	N/A	Zoom tutorial - covering Week 11

### Review/Exam Week - 05 Jun 2023

Module/Topic	Chapter	Events and Submissions/Topic
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### Exam Week - 12 Jun 2023

Module/Topic	Chapter	Events and Submissions/Topic
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## Term Specific Information

As the name suggests, this unit will provide you with technical and applied knowledge of Chemical Pathology.

LMED28001 Chemical Pathology 1 is a core unit in one course:

CM18 - Master of Laboratory Medicine

Lectures and tutorials will be delivered each week at the Rockhampton campus, and students who are enrolled in either mixed mode or at the Melbourne campus will be able to join these classes via Zoom. These tutorials will also be recorded for the benefit of those students who are unable to attend the live lectures and tutorials. During the tutorials, you 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/attend the weekly lectures beforehand and attempt the weekly study questions.

You are strongly encouraged to participate in tutorials, as studies have shown that students who attend the tutorials and participate in discussions have higher rates of success (Karnik et al., 2020). 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.

You will be provided an opportunity to explore how to apply the knowledge learnt in lecture material in a compulsory residential school (exact dates to be advised). **This residential school is planned to take place outside of the standard teaching term and students will be advised of the dates when scheduled.**

The **Unit Coordinator** for this Unit is **Rob White** who can be contacted by e-mail ([r.b.white@cqu.edu.au](mailto:r.b.white@cqu.edu.au)) or via the **Moodle forums**.

If scheduled lectures or tutorials fall on a public holiday they will be pre-recorded and posted on the Moodle page. The tutorials will summarise the weekly lecture content and provide an opportunity for you to discuss the lecture content.

I encourage you to engage with the tutorials preferably by attending in person or virtually via Zoom or if that is not possible review the video and post any questions on the **Q&A Forum**.

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 on the unit's Moodle page

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 end of term test

## Assessment Tasks

### 1 Case Report

#### Assessment Type

Written Assessment

#### Task Description

You will be provided with a clinical case study on the Moodle page.

You will be provided with information regarding the clinical presentation, patient history and specific biochemical parameters (provided by an automated analyser) for this clinical case study. You are required to write a report (around 2,500 words) using a case study approach describing the pathophysiology, specific biochemical profile characteristics observed that led to the provisional diagnosis, differential diagnoses and potential treatment options. You may also

recommended further tests that will assist in confirming the diagnosis. Further details on the case, a template and an exemplar will be provided to you on the Moodle site to assist in preparation.

**Assessment Due Date**

Week 6 Monday (17 Apr 2023) 10:00 am AEST

The case study report should be uploaded into Moodle.

**Return Date to Students**

Week 8 Monday (1 May 2023)

Feedback will be provided within two (2) weeks of submission.

**Weighting**

20%

**Minimum mark or grade**

50%

**Assessment Criteria**

The assessment task is marked according to how well you have met the specific requirements and in accordance with the criteria outlined below:

**Presentation:** The report is presented in the provided template with clarity of purpose and coherence of expression (spelling, grammar, syntax) in a clear and organised manner.

**Abstract:** Provides a clear overview and overall summary of the case study.

**Introduction:** Provides necessary background information and pathophysiology of the case. Does not discuss the final diagnosis rather supports the intended diagnosis via arguments.

**Materials and Methods:** Briefly describes all the methods used to aid in diagnosis. Discusses further tests to be employed in order to confirm the diagnosis.

**Results:** All data presented clearly with reference ranges. Layout is clear with further tests and expected results discussed.

**Discussion:** Clear discussion of the results with supporting arguments and reasoning for arriving at the final diagnosis.

**References:** Correct referencing system used with appropriate in-text references.

**Referencing Style**

- [Harvard \(author-date\)](#)
- [Vancouver](#)

**Submission**

Online

**Submission Instructions**

The documents are to be uploaded into Moodle.

**Learning Outcomes Assessed**

- Describe the rationale and clinical correlation of specialised biochemical tests used in the detection and monitoring of processes affecting the major organ systems

## 2 Practical Report

**Assessment Type**

Written Assessment

**Task Description**

Attendance at the Residential School / Laboratory is mandatory to pass the unit. This will be scheduled in CQUniversity's Term 3 and dates and times will be advised once scheduled.

You will be required to write a report in basic scientific journal format (from data generated and/or supplied during the residential schools). Scientific journal format typically contains the following elements:

- Abstract
- Introduction
- Methods
- Results
- Discussion/conclusions
- Limitations/future directions

This task requires you to complete a similar yet abbreviated format that only requires IMRAD (introduction, methods, results and discussion/limitations).

**Introduction (20 marks):** The introduction should be between 500–700 words in length and will provide the reader with sufficient information to understand why this study was performed and also provide any essential background

information (with references to journal articles or text books) that is needed for interpretation of the results and discussion. It should conclude with a specific aim of the study. As a general guide—approximately 3-6 paragraphs with important and interesting background information that has been correctly referenced.

**Methods (10 marks):** There is no need to completely rewrite the methods section in detail. This section should be a brief summary approximately 1-2 paragraphs in length (100-200 words).

**Results (10 marks):** This section should contain the experimental results in summary form (means/SD), presented in either tables or graphs, not both. It is not enough just to use tables and graphs—you must also state the results referring to the table or figure. All tables and figures must be labelled appropriately. There should be no interpretation of results in this section—just state the results observed! Leave any interpretation to the discussion (200-400 words).

**Discussion (40 marks):** This section should be between 500-700 words in length and will provide an analysis and interpretation of the results of the study. The implication of your results should be discussed, referring back to statements made in your introduction. Alternative explanations should be offered if necessary especially for negative or unexpected results. Errors could also be discussed.

**References (10 marks):** All articles or texts referred to in the report need to be listed in this section. Referencing style should follow either the "Vancouver" or "Harvard" style as listed in the unit profile.

**Writing Style/Presentation (10 marks):** Reports should be clearly written in full sentences (not point form) using correct spelling and grammar. Abbreviations should be explained when first used. Any diagram (added from reference material) must be of good quality and sources must be acknowledged appropriately. The use of scientific writing style is important—peruse scientific journal entries. Of particular importance is clarity of written expression (clearly stated ideas and outcomes). The document should be in scientific journal format with well designed figures, graphs and tables where appropriate.

### Assessment Due Date

Due to be handed in 1 week after the completion of the residential school.

### Return Date to Students

To be marked and returned 2 weeks after submission deadline.

### Weighting

30%

### Minimum mark or grade

50%

### Assessment Criteria

Clarity of expression (spelling and grammar), the inclusion of key facts, accurate research, correct referencing, and clear diagrams will be important general criteria for performing well in this assessment item. The use of information contained solely within the study notes/practical support information will result in the awarding of a passing grade at best. In order to obtain higher marks information from other sources will be required. Students who use relevant information from other sources in their reports will be successful. As a guide, between 8 to 10 journal articles should be used! The failure to cite references in your assignments will result in you not achieving full value for your efforts.

### Referencing Style

- [Harvard \(author-date\)](#)
- [Vancouver](#)

### Submission

Online

### Submission Instructions

Report are to be uploaded into Moodle.

### Learning Outcomes Assessed

- Appraise the limitations of laboratory procedures and regulatory aspects including external quality assurance and accreditation bodies
- Demonstrate skills in the use of biochemical instrumentation including corrective action as required
- Evaluate biochemical clinical cases to derive a provisional diagnosis.

## 3 Laboratory Workbook

### Assessment Type

Laboratory/Practical

### Task Description

Attendance at the Residential School / Laboratory is mandatory to pass the unit. This will be scheduled in CQUniversity's



Term 3 and dates and times will be notified when scheduled.

You will be provided with a laboratory workbook on the Moodle page. This workbook will contain all the tasks that need to be completed during the residential school block. It will also contain a series of short questions and patient reports to be completed in relation to the authentic cases provided. Group experimental activities during the residential school will foster team work and provide hands-on experience of the biochemical techniques used in pathology laboratories. Completion of the workbook will evidence student engagement and understanding of the principles behind the Biochemical tests. Laboratory staff or demonstrators will assess your individual experimental capability during residential school to ensure your understanding of the learning outcomes.

### **Assessment Due Date**

Due to be handed in at the completion of the residential school

### **Return Date to Students**

Due to be marked within 2 weeks following the residential school.

### **Weighting**

Pass/Fail

### **Minimum mark or grade**

50%

### **Assessment Criteria**

Residential school Workbook component:

Each section will have respective assigned marks as indicated on the provided workbook.

The Workbook is a PASS/FAIL Assessment.

The laboratory staff will provide immediate verbal feedback to you on the practical hands-on aspect of this assessment item.

The laboratory workbook template will contain the weighting of marks associated with the tasks and subsequent questions/reports to be completed

### **Referencing Style**

- [Harvard \(author-date\)](#)
- [Vancouver](#)

### **Submission**

Online

### **Submission Instructions**

A scanned version of the laboratory workbook is to be submitted on the Moodle page following the residential school.

### **Learning Outcomes Assessed**

- Demonstrate skills in the use of biochemical instrumentation including corrective action as required

## **Examination**

### **Outline**

Complete an invigilated examination.

### **Date**

During the examination period at a CQUniversity examination centre.

### **Weighting**

50%

### **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).

## 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