



BMSC12003 Haematology and Transfusion Science

Term 2 - 2023

Profile information current as at 30/04/2024 05:29 am

All details in this unit profile for BMSC12003 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 successful completion of this unit, you will be able to discuss fundamentals of haematology and transfusion science, including erythrocyte, leukocyte, reticulocyte and platelet morphology, enumeration and function. Skills in enumeration of blood cells and tests of haematological function will be developed during practical exercises. You will learn to contrast normal blood cell function with disorders of haemostasis affecting blood clotting and iron metabolism affecting blood cell numbers.

Details

Career Level: *Undergraduate*

Unit Level: *Level 2*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Pre-requisites: BMSC11002 Human Body Systems 2 OR BMSC11008 Medical Anatomy and Physiology 2 OR BMSC11011 Human Anatomy and Physiology 2 AND BUSN11016 Introduction to Study and Professional Practice OR BMSC11003 Professional Practice in Medical Sciences

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

- Bundaberg
- 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 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. **Case Study**

Weighting: 20%

2. **Laboratory/Practical**

Weighting: Pass/Fail

3. **Practical Assessment**

Weighting: 30%

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](#).

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 SUTE and informal feedback from students.

Feedback

Some students found the practical assessment task at the end of the Residential School helpful in consolidating their learning.

Recommendation

Retain the practical assessment task at the Residential School.

Feedback from SUTE

Feedback

Assessment return could have been more prompt to allow a better understanding of progress.

Recommendation

Consider ways to improve assessment return.

Feedback from SUTE

Feedback

Students felt that the Residential School was well structured and helped to put theory into practice.

Recommendation

Retain the general structure of the Residential School.

Feedback from SUTE and informal feedback from students.

Feedback

Some students suggested that more practical task focused videos could be included to help prepare them for the Residential School and that practical demonstrations of techniques at the Residential School would be helpful.

Recommendation

Consider including additional instructional videos and practical demonstrations both before and at the Residential School.

Unit Learning Outcomes

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

1. Describe the physiological process of haematopoiesis
2. Distinguish between normal and abnormal erythrocyte, leukocyte, reticulocyte and platelet morphology
3. Describe the causes and diagnosis of selected haematologic and haemostatic disorders
4. Interpret a full blood count and related basic haematological tests
5. Discuss the principle of operation for selected automated and non automated haematological laboratory test procedures
6. Test and conduct quality control of basic haematological, immunohaematological and coagulation procedures in the laboratory.

Alignment of Learning Outcomes, Assessment and Graduate Attributes

 N/A Level	 Introductory Level	 Intermediate Level	 Graduate Level	 Professional Level	 Advanced Level
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Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
1 - Case Study - 20%	•	•	•	•		
2 - Laboratory/Practical - 0%						•
3 - Practical Assessment - 30%		•		•		
4 - Examination - 50%	•	•	•	•	•	

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes					
	1	2	3	4	5	6
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

BMSC12003

Prescribed

Clinical Hematology Atlas

Edition: 6th (2022)

Authors: Jacqueline H. Carr

Elsevier

St Louis , Missouri , USA

ISBN: 9780323711920

Binding: Spiral

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Prescribed

Rodak's Hematology Clinical Principles and Applications

Edition: 6th (2020)

Authors: Elaine Keohane, Larry Smith and Jeanine Walenga

Elsevier

St Louis , Missouri , USA

ISBN: 9780323530453

Binding: Hardcover

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Supplementary

Modern Blood Banking & Transfusion Practcies

Edition: 7th (2019)

Authors: Denise M Harmening

FA Davis

Philadelphia , Penn , USA

ISBN: 9780803668881

Binding: Hardcover

[View textbooks at the CQUniversity Bookshop](#)

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Virtual Microscopy Image Viewer

Referencing Style

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

- [American Psychological Association 7th Edition \(APA 7th edition\)](#)
- [Vancouver](#)

For further information, see the Assessment Tasks.

Teaching Contacts

Roxina Sharma Unit Coordinator

r.r.sharma@cqu.edu.au

Jacqui Dennis Unit Coordinator

j.dennis@cqu.edu.au

Schedule

Week 1: Haematopoiesis/ Red cells - 10 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
1. Introduction to unit 2. Haematopoiesis, cells of the blood, structure, morphology and function 3. RBC nomenclature, classification & production	Rodak's Hematology: 1 & 4 ; Clinical Hematology Atlas: 1 - 3 Rodak's Hematology: 5 - 6;	Tutorial: Overview of the unit and FAQ's Introduction to Manual techniques Introduction to Morphology

Week 2: Haemoglobin/ Platelet structure and function - 17 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
1. Hb and iron production, metabolism and destruction 2. Platelet structure and function	Rodak's Hematology: 7 & 8 Rodak's Hematology: 10, 37-38; Clinical Hematology Atlas: 4	Tutorial: Red cell morphology : Anaemia, Thalassaemia

Week 3: Automation and Point of Care testing/ FBE and Red cell Morphology - 24 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
1. Automation and POC Testing 2. The FBE, Reference Ranges, Quality control 3. Abnormal RBC morphology, RBC inclusions	Rodak's Hematology: 11 & 12 Rodak's Hematology: 13 Rodak's Hematology: 16; Clinical Hematology Atlas: 10 - 13	Tutorial: Automation Tutorial

Week 4: Anaemia/ Haemoglobinopathies - 31 Jul 2023

Module/Topic	Chapter	Events and Submissions/Topic
1. Introduction to the Anaemias • Microcytic anaemia • Normocytic anaemia • Macrocytic anaemia • Haemolytic anaemia 2. The Haemoglobinopathies	Rodak's Hematology: 17 -18 Rodak's Hematology: 20-23 Rodak's Hematology: 24; Clinical Hematology Atlas: 10 - 13	Tutorial: Anaemia/ Haemoglobinopathies

Week 5: Haemostasis - 07 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic
1. Introduction to Haemostasis - the Coagulation Cascade & Platelet Function and laboratory diagnosis of coagulation disorders 2. Anticoagulant therapy & monitoring	Rodak's Hematology: 35 - 36 & 41-42 Rodak's Hematology: 39-40	Tutorial: Diagnostic Haemostasis Case Study Due: Week 5 Thursday (10 Aug 2023) 11:45 pm AEST

Vacation Week - 14 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic
No classes scheduled this week.	N/A	

Week 6: Introduction to White cells - 21 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to White Blood Cells 1 • Structure and function of white blood cells. • Differential white cell count. • 'Benign' leucocyte disorders and investigations	Rodak's Hematology: 9; Clinical Hematology Atlas: 14 Rodak's Hematology:13; Clinical Hematology Atlas: 5 - 9 Rodak's Hematology: 26; Clinical Hematology Atlas:14	Tutorial: White cell morphology

Week 7: White Blood cells 2/ Flow cytometry - 28 Aug 2023

Module/Topic	Chapter	Events and Submissions/Topic
1. White Blood Cells 2 'Malignant' leucocyte disorders and investigations. 2. Introduction to Flow cytometry	Rodak's Hematology: 27 - 28; Clinical Hematology Atlas: 15 - 20	Tutorial: Malignant white cell morphology Flow cytometry

Week 8: Introduction to Transfusion Science; Residential School (Rockhampton) - 04 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
1. Introduction to Transfusion Science 2. Blood Donations and Processing 3. The Human Blood Group Systems Residential School Rockhampton campus	Modern Blood Banking & Transfusion Practices: 1, 6, 7, 8, 13, 15 Practical Workbook and Laboratory Manual	Tutorial: Introduction to Transfusion Science Blood donation and processing Human blood group systems Assessment Task 3: Practical Assessment will be completed on the final day of residential school.

Week 9: Residential school : Bundaberg - 11 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
Residential school: Bundaberg campus	Practical Workbook and Laboratory Manual	Assessment Task 3: Practical Assessment will be completed on the final day of residential school. Laboratory Workbook Due: Week 9 Friday (15 Sept 2023) 11:45 pm AEST

Week 10: Antibodies and crossmatching - 18 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
1. Antibody Screening and Identification 2. Pretransfusion Compatibility Testing 3. Autoantibody - Definition and Analysis	Modern Blood Banking & Transfusion Practices: 10, 11, 21	Tutorial: Pretransfusion Compatibility Testing & autoantibodies

Week 11: Haemolytic Disease of the Foetus and Newborn/ Adverse effects of Blood Transfusion - 25 Sep 2023

Module/Topic	Chapter	Events and Submissions/Topic
1. Haemolytic Disease of the Foetus and Newborn (HDFN) 2. Adverse Effects of Blood Transfusion	Modern Blood Banking & Transfusion Practices: 17, 20	Tutorial: HDFN and adverse transfusion outcomes

Week 12: Revision Week - 02 Oct 2023

Module/Topic	Chapter	Events and Submissions/Topic
Revision lecture and preparation for final assessment.		Tutorial: Revision Tutorial

Review/Exam Week - 09 Oct 2023

Module/Topic	Chapter	Events and Submissions/Topic
		The End-of-unit exam will be scheduled in the CQUniversity examination period between 12/10/23 - 20/10/23. The exact date will be advised on the unit Moodle page. The End-of-unit exam comprises 50% of the overall unit mark.

Exam Week - 16 Oct 2023

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

Your unit coordinators are Jacqui Dennis and Roxina Sharma.

You can contact Jacqui/ Roxina via the following means:

- The forum on the unit's Moodle site. The forum for this unit is continuously monitored and you can expect a response within two (2) business day of posting your question;
- Or through email (j.dennis@cqu.edu.au) (r.r.sharma@cqu.edu.au)

This unit will provide you with a good understanding of the theoretical basis of Haematology with an understanding of laboratory techniques and how this is applied to diagnostic and clinical interpretation.

Lectures and tutorials will be delivered each week on Zoom, and students will be able to join these classes via Zoom from their location. These lectures and tutorials will also be recorded for the benefit of those students who are unable to attend the live lectures and tutorials.

You will get the most benefit from the tutorials if you watch/attend the weekly lectures beforehand and complete all related readings.

You will be provided an opportunity to explore how to apply the knowledge learnt in lecture and tutorial material in a compulsory residential school. This residential school is planned to take place in Week 8 for Rockhampton students and in Week 9 for Bundaberg students. The residential school will allow you to apply some of the techniques you have learnt throughout the unit and gain a deeper understanding of the relevant theory which underpins the techniques. You will also gain a better clinical understanding of the interpretation of the techniques.

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 attending or watching recorded lectures and revising the content through study notes

3 - 4 hours per week completing the weekly readings and other material on the unit's Moodle site.

1 - 2 hours per week attending the weekly tutorial and contributing to discussions and revising the content provided.

3 - 4 hours per week preparing your assessments or studying for your exams.

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.

Karnik, A., Kishore, P., & Meraj, M. (2020). Examining the linkage between class attendance at university and academic performance in an International Branch Campus setting. *Research in Comparative and International Education*, 15(4), 371-390. <https://doi.org/10.1177/1745499920958855>

Assessment Tasks

1 Case Study

Assessment Type

Case Study

Task Description

You will be provided with an authentic clinical case study on the Moodle site.

The following information regarding the case will be available to you: clinical presentation, patient history, blood smear morphology, haematological parameters (provided by an automated analyzer) and biochemical changes (if any).

You are then required to answer a series of questions in a Moodle Quiz to obtain further information and test results. This quiz is worth 40% of the marks for this assessment. You are then required to write a report (around 1,000 words) using a case study approach describing the pathology observed, aetiology, specific morphological or haematological characteristics observed that led to the diagnosis, differential diagnosis, treatment options and any recommended further tests. This case report is worth 60% of the marks for this assessment.

Guidelines to complete the report, marking rubric and a template will be available on the Moodle site.

Assessment Due Date

Week 5 Thursday (10 Aug 2023) 11:45 pm AEST

Return Date to Students

Week 6 Friday (25 Aug 2023)

Results will be posted on Moodle. There will be an opportunity to discuss this assessment during the Residential School.

Weighting

20%

Minimum mark or grade

50%

Assessment Criteria

The written 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 required template. Clarity of purpose and coherence of expression (spelling, grammar, syntax); clear and organised flow of information.

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 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: APA or Vancouver referencing system used with appropriate in-text references.

Referencing Style

- [American Psychological Association 7th Edition \(APA 7th edition\)](#)
- [Vancouver](#)

Submission

Online

Submission Instructions

The documents are to be uploaded to Moodle

Learning Outcomes Assessed

- Describe the physiological process of haematopoiesis
- Distinguish between normal and abnormal erythrocyte, leukocyte, reticulocyte and platelet morphology
- Describe the causes and diagnosis of selected haematologic and haemostatic disorders
- Interpret a full blood count and related basic haematological tests

2 Laboratory Workbook

Assessment Type

Laboratory/Practical

Task Description

You will be provided with a laboratory workbook on the Moodle site.

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 haematological techniques used in pathology laboratories.

Completion of the workbook will evidence student engagement and understanding of the principles behind the haematological tests.

Laboratory staff or demonstrators will assess your individual experimental capability during residential school to ensure your understanding of the learning outcomes.

You will be required to submit the completed version of the laboratory workbook on the Moodle site.

Assessment Due Date

Week 9 Friday (15 Sept 2023) 11:45 pm AEST

Return Date to Students

Results will be posted on Moodle

Weighting

Pass/Fail

Minimum mark or grade

50%

Assessment Criteria

Each section will have respective assigned marks depending on the complexity of the task to be performed.

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

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.

Referencing Style

- [American Psychological Association 7th Edition \(APA 7th edition\)](#)
- [Vancouver](#)

Submission

Online

Submission Instructions

A scanned version of the laboratory workbook will be submitted on the Moodle page following the Residential School

Learning Outcomes Assessed

- Test and conduct quality control of basic haematological, immunohaematological and coagulation procedures in the laboratory.

3 Practical Assessment

Assessment Type

Practical Assessment

Task Description

On the final day of your residential school block you will have a final practical assessment. Further details regarding the practical assessment will be available on the Moodle page.

Assessment Due Date

Return Date to Students

Results will be posted on Moodle

Weighting

30%

Minimum mark or grade

50%

Assessment Criteria

On the final day of your residential school block you will have a final practical assessment. Further details regarding the practical assessment will be available on the Moodle page.

Referencing Style

- [American Psychological Association 7th Edition \(APA 7th edition\)](#)
- [Vancouver](#)

Submission

Offline

Submission Instructions

Assessments are to be handed in at the conclusion of the assessment on the final day of the Residential School.

Learning Outcomes Assessed

- Distinguish between normal and abnormal erythrocyte, leukocyte, reticulocyte and platelet morphology
- Interpret a full blood count and related basic haematological tests

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