



MEDI12008 *Fundamentals of Radiographic Imaging*

Term 2 - 2017

Profile information current as at 25/04/2024 04:50 pm

All details in this unit profile for MEDI12008 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

The unit will provide you with the foundation knowledge needed for interpretation of radiographic image appearances and safe and effective use of digital radiographic imaging systems. You will learn the theoretical concepts of radiation production and control, radiation interactions in matter, image acquisition and digital image processing. You will learn how and why to limit radiation exposure through the study of radiation bioeffects and best practice in radiation protection.

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

Prerequisite: MEDI11002 Physics for Health Sciences Antirequisite: MEDI12002 Science & Instrumentation 1

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 - 2017

- Brisbane
- Mackay
- Sydney

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. **In-class Test(s)**

Weighting: 40%

2. **In-class Test(s)**

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 Student feedback

Feedback

A response by one student was that feedback provided on assessment work did not help them learn while five strongly agreed it did.

Recommendation

Provide more personalised feedback to assessment tasks.

Feedback from Student feedback

Feedback

Design and structure of the course (weekly triplet of lecture, lab and tutorial) enabled integration of theory and practice

Recommendation

Where possible, maintain the integrated design.

Unit Learning Outcomes

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

1. Outline the construction, operation and clinical use of digital radiographic image acquisition and processing systems.
2. Discuss the underlying physical principles and the controls involved in x-ray beam production, emission and detection.
3. Apply the concepts of image geometry to discuss the controlled production of a projection radiograph from a point source of radiation.
4. Discuss parameters of image quality of digital radiographs.
5. Outline deterministic and stochastic effects of ionising radiation and current theories of dose-response their relationships.
6. Discuss safe practices and radiation protection standards in the clinical use of ionising radiation.

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes					
	1	2	3	4	5	6
1 - In-class Test(s) - 40%	•	•	•	•		
2 - In-class Test(s) - 60%	•	•	•	•	•	•

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						

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - In-class Test(s) - 40%	•	•		•						
2 - In-class Test(s) - 60%	•	•		•		•		•		

Textbooks and Resources

Textbooks

MEDI12008

Prescribed

Radiographic Imaging and Exposure

Edition: 5th (2016)

Authors: Terri L. Fauber

Elsevier

St. Louis , Missouri , USA

ISBN: 9780323356244

Binding: Paperback

Additional Textbook Information

The hard copy textbook can be purchased through the University Bookshop. The e-book version of the text is not available through the publisher for distribution in Australia. However, the e-book can be purchased through Amazon's Kindle store.

[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 style: [Harvard \(author-date\)](#)

For further information, see the Assessment Tasks.

Teaching Contacts

Caroline Falconi Unit Coordinator

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Schedule

Week 1 - 10 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to radiography		
• The radiograph as an attenuation map		
• introduction to radiographic terminology		
• overview of the imaging process		
• introduction to attributes of a radiographic image		
• viewing radiographic images		

Week 2 - 17 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
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X-ray beam production and control

- x-ray tube basic construction and operation
- controls of the emitted beam's quantity and quality
- introduction to technical factor settings

Fauber Chapter 2

tutorial on Week 1 content

Week 3 - 24 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
X-ray interactions in matter <ul style="list-style-type: none"> • attenuation • attenuation processes • factors affecting quantity of attenuation • fractional attenuation and transmission • differential attenuation 	Fauber Chapter 3 Additional readings as posted on unit Moodle site	tutorial on Week 2 content tutorial on assessments

Week 4 - 31 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Control of spatial information <ul style="list-style-type: none"> • image geometry and projections through ray paths • distortions of spatial information (magnification, shape distortion, position distortion) • spatial resolution • unsharpness • control of geometric unsharpness 	Fauber Chapter 3 Additional readings as posted on unit Moodle site	tutorial on Week 3 content

Week 5 - 07 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Control of contrast information <ul style="list-style-type: none"> • subject contrast • use of beam energy to control subject contrast • quantum mottle • use of beam quantity to control mottle • scatter behaviour • impact of scatter on contrast resolution 	Fauber Chapters 3, 6 & 7 Additional readings as posted on unit Moodle site	tutorial on Week 4 content

Vacation Week - 14 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 21 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Control of scatter <ul style="list-style-type: none"> • factors affecting the magnitude of scatter produced • collimation • grids • air gap technique 	Fauber Chapter 7 Additional readings as posted on unit Moodle site	tutorial on Week 5 content In-class test during Wednesday timetabled class time

Week 7 - 28 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
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Principles of clinical radiographic imaging		
<ul style="list-style-type: none"> • standardisation of projections and positioning • technical factors and technique charts • equipment limitations • image evaluation 	Fauber Chapters 6, 8 & 9	tutorial on Week 6 content

Week 8 - 04 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Digital image fundamentals <ul style="list-style-type: none"> • digital image and image file properties • overview of the imaging process • image processing • control of spatial and contrast resolution of digital images 	Fauber Chapter 4 Additional readings as posted on unit Moodle site	tutorial on Week 7 content

Week 9 - 11 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Digital imaging technology <ul style="list-style-type: none"> • image receptor systems • image display and viewing • display adjustments (windowing, zoom, annotation) • image optimisation using processing • dose optimisation using digital radiograph • exposure index 	Fauber Chapter 4 Additional readings as posted on unit Moodle site	tutorial on Week 8 content

Week 10 - 18 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Radiation biology <ul style="list-style-type: none"> • dose metrics (exposure, absorbed dose and effective dose) • Bioeffects of ionising radiation (deterministic and stochastic effects) • Dose response theories 	Additional readings as posted on unit Moodle site	tutorial on Week 9 content

Week 11 - 25 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Radiation protection <ul style="list-style-type: none"> • ALARA principle • legislation and professional responsibilities • justification, limitation and optimisation • best practices in dose management • considerations for paediatric and pregnant patients • radiation occupational health and safety 	Fauber Chapter 1 & Appendix C Additional readings as posted on unit Moodle site	tutorial on Week 10 content tutorial on preparation for final in-class test

Week 12 - 02 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic
<ul style="list-style-type: none"> • Revision and consolidation 		tutorial on Week 11 content Second in-class test on Wednesday at timetabled class time

Review/Exam Week - 09 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic
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Exam Week - 16 Oct 2017

Term Specific Information

This unit is delivered across three campuses by a cross-disciplinary team to provide expertise from both the radiographic and chiropractic perspectives. You are provided with a set of learning goals for each week's topics to communicate the breadth and depth of the knowledge and skills you are required to demonstrate in the unit assessments. Lectures are provided as pre-recorded videos via the unit Moodle site. You will have weekly face to face tutorials from Weeks 2 - 12. The tutorials are your opportunity to check your understanding of the content from the previous week as you apply and integrate the concepts with guidance from your instructor. In Weeks 3 and 11 additional tutorials are provided by the unit coordinator for students at all campuses to discuss strategies for demonstrating your knowledge and skills on the in-class tests.

The textbook for this year has been changed relative to last year, but because many students may have access to last year's textbook (Limited Radiography by F. Campeau), suggested readings from last year's text will be posted on the unit Moodle site.

Assessment Tasks

1 In-Class Test 1

Assessment Type

In-class Test(s)

Task Description

You will write an in-class test to demonstrate your ability to apply the concepts and use the terminology from Weeks 1 - 5 of the unit. All questions will be based on the posted weekly learning goals for those weeks. Question tasks will be of the same types that you will practice in tutorials. These question tasks will include analysis of projected diagrams, photographs and radiographs, creation of line diagrams to illustrate concepts, explanations, definitions and discussions. Any projected visuals (diagrams, photographs and/or radiographs) will also be printed onto the test paper in low resolution. You will need to ensure that you can see the projected visuals during the test.

This test is a closed-book assessment of 105 minutes (1 3/4 hour) duration. You will have a five minute settling in period and 10 minute perusal time prior to the allotted writing time. You will write the test under examinations conditions as detailed in the Assessment Procedures. You will hand in your test paper and rough paper at the end of the test period. This test must be written at the timetabled date and time. As per the University's Assessment Procedures, there is no provision for a late submission and no late penalty can be applied. In the absence of an approved extension, you cannot complete this assessment at a later time, and you will receive a mark of zero for the assessment if you have not completed it by the scheduled date and time.

Assessment Due Date

On Wednesday of Week 6 (23 August) during the timetabled class time

Return Date to Students

Week 8 Friday (8 Sept 2017)

Weighting

40%

Assessment Criteria

Question responses will be scored on the following criteria:

- correct use and defining of terminology
- correct selection and application of core concepts to the specific question situation
- clarity, correctness, relevance and completeness of the response in addressing the question that was asked

Marks for each question are allocated based on the number of key points expected in the response to sufficiently address the question, and will be indicated on the test paper.

Referencing Style

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

Submission

Offline

Learning Outcomes Assessed

- Outline the construction, operation and clinical use of digital radiographic image acquisition and processing systems.
- Discuss the underlying physical principles and the controls involved in x-ray beam production, emission and detection.
- Apply the concepts of image geometry to discuss the controlled production of a projection radiograph from a point source of radiation.
- Discuss parameters of image quality of digital radiographs.

Graduate Attributes

- Communication
- Problem Solving
- Information Literacy

2 In-class Test 2

Assessment Type

In-class Test(s)

Task Description

You will write an in-class test to demonstrate your ability to apply the concepts and use the terminology from all weeks of study, with emphasis on Weeks 6 - 11 of the unit. All questions will be based on the posted weekly learning goals. Question tasks will be of the same types that you will practice in tutorials. These tasks will include analysis of projected diagrams, photographs and radiographs and creation of line diagrams to illustrate concepts, as well as explanations, definitions and discussions. Any visuals that are provided for specific questions will be projected in the testing room and will also be printed in low resolution on the test paper. You will need to ensure that you can see the projected visuals during the test.

This test is a closed-book assessment of 105 minutes (1 3/4 hours) duration. You will have a five minute settling in period and 10 minute perusal time prior to the allotted writing time. You will write the test under examinations conditions as detailed in the Assessment of Coursework procedures. You will hand in your test paper and rough paper at the end of the test period.

This test must be written at the timetabled date and time. As per the Assessment of Coursework Procedures, this task is to be completed during a defined period. There is no opportunity to apply a late penalty. In the absence of an approved extension, you cannot complete this assessment at a later time, and you will receive a mark of zero for the assessment if you have not completed by the scheduled date and time.

Assessment Due Date

On Wednesday of Week 12 (4 October) during the timetabled class time

Return Date to Students

Exam Week Friday (20 Oct 2017)

Weighting

60%

Assessment Criteria

Question responses will be scored on the following criteria:

- correct use and defining of terminology
- correct selection and application of core concepts to the specific question situation
- clarity, correctness and completeness of the response in addressing the question that was asked

Marks for each question are allocated based on the number of key points expected in the response to sufficiently address the question, and will be indicated on the test paper.

Referencing Style

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

Submission

Offline

Learning Outcomes Assessed

- Outline the construction, operation and clinical use of digital radiographic image acquisition and processing

systems.

- Discuss the underlying physical principles and the controls involved in x-ray beam production, emission and detection.
- Apply the concepts of image geometry to discuss the controlled production of a projection radiograph from a point source of radiation.
- Discuss parameters of image quality of digital radiographs.
- Outline deterministic and stochastic effects of ionising radiation and current theories of dose-response their relationships.
- Discuss safe practices and radiation protection standards in the clinical use of ionising radiation.

Graduate Attributes

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

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