MEDI12007 *Quality Processes for Dose and Image Optimisation*
Term 2 - 2017

Profile information current as at 27/09/2024 10:11 am

General Information

Overview
You will apply knowledge of equipment operation and use as well as radiographic image acquisition techniques to the optimisation of radiographic images and patient dose. You will perform quality control and quality assurance procedures to measure and maintain the performance of radiographic and ancillary equipment. You will investigate the impact of technical factor selection on patient dose and image quality. Through these you will learn to make informed selections of technical parameters for radiographic procedures and to justify your decision-making.

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: MEDI12001 Radiation Science and MEDI12002 Science and Instrumentation 1 Co-requisite: MEDI12004 Medical Imaging Clinical Course 1 MEDI12005 Science & Instrumentation 2
Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the Assessment Policy and Procedure (Higher Education Coursework).

Offerings For Term 2 - 2017

- Mackay

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. **Practical and Written Assessment**
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 Have your say Coordinator reflection

Feedback
Assessment requirements and marking rubric(s)

Recommendation
To ensure that the students understand the assessment and marking requirements, include short videos highlighting these aspects. Provide examples of good and poor approaches with respect to the marking rubric(s).

Feedback from Have your say Coordinator reflection

Feedback
Number of assessments

Recommendation
Due to being a condensed delivery, it is recommended to have two assessment items instead of three in future delivery of the unit. This will encourage better student engagement and reduce stress levels among students.

Feedback from Have your say Coordinator reflection

Feedback
Timing of lectures

Recommendation
Timing of the lecture on the same day as two other units impacted on student focus and participation in the unit. Review scheduling of lectures for next delivery of the unit.

Unit Learning Outcomes

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

1. Assess the performance of radiographic and ancillary equipment relative to quality standards.
2. Troubleshoot imaging faults and equipment problems.
3. Assess radiographic images for various objective and subjective aspects of image quality.
4. Relate radiographic equipment performance, use and technical parameter selection to patient dose and image quality.
5. Justify the selection of technical parameters for a radiographic image in the context of the clinical circumstances.

Medical Radiation Practice Board of Australia's Professional Capabilities Standards:
Domain 1: 3. Assume responsibility and accept accountability for clinical decisions.
Domain 3: 1. Apply critical and reflective thinking to resolve clinical challenges.
Domain 4: 1. Implement safe radiation practice appropriate to their division of registration. 2. Confirm and operate equipment safely and appropriate to their division of registration. 3. Maintain safety of self and others in the work environment appropriate to their division of registration. 4. Safely manage radiation and radioactivity in the environment.
Domain 5: 2. Apply principles of medical radiation physics and instrumentation.

Alignment of Learning Outcomes, Assessment and Graduate Attributes

— N/A Level ∘ Introductory Level • Intermediate Level • Graduate Level ∘ Professional Level ∘ Advanced Level

Alignment of Assessment Tasks to Learning Outcomes

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

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

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

Textbooks and Resources

Textbooks

There are no required textbooks.

Additional Textbook Information
Students are expected to have regular access to the two texts used for the Science & Instrumentation units MEDI12002, MEDI12005 and MEDI13001.

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

Reshmi Kumar Unit Coordinator
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Schedule

Week 1 - 10 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic

Week 2 - 17 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic

Week 3 - 24 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic

Week 4 - 31 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic

Week 5 - 07 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic

Vacation Week - 14 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Break Week		

Week 6 - 21 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic

Quality Control & QC testing • Scope, process and documentation • Benefits of QC program • Performance standards • Evidence of compliance • QC testing for visual inspection/check of equipment • QC testing of collimation & location controls	Refer to the recommended and suggested readings on the unit Moodle site	Lab 1

Week 7 - 28 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
QC testing of Radiographic & Ancillary Equipment - Part 1 • QC testing of generator • QC testing of bucky and grids	Refer to the recommended and suggested readings on the unit Moodle site	Lab 2

Week 8 - 04 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
QC testing of Radiographic & Ancillary Equipment - Part 2 • QC testing of CR image receptor and CR image reader • QC testing of DR detectors	Refer to the recommended and suggested readings on the unit Moodle site	Lab 3

Week 9 - 11 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
QC testing of Radiographic & Ancillary Equipment - Part 3 • QC testing of AEC system	Refer to the recommended and suggested readings on the unit Moodle site	Lab 4

Week 10 - 18 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Troubleshooting equipment problems • Identifying and using symptoms to find the cause • Systematic analysis using existing tools and processes • Image artifacts	Refer to the recommended and suggested readings on the unit Moodle site	Lab 5 **Imaging Equipment Testing** Due: Week 10 Friday (22 Sept 2017) 3:00 pm AEST

Week 11 - 25 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Assessing radiographic image quality • subjective versus objective assessment • standard versus target EI • deviation index • test tools for image quality measurement • ROC, sensitivity, specificity, accuracy, gold standard, TP, FP, TN, FN about diagnostic tests.	Refer to the recommended and suggested readings on the unit Moodle site	Lab 6

Week 12 - 02 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic
Selection of technical parameters in context of clinical circumstances • Clinical factors impacting performance demands of the imaging system and modification of techniques.	Refer to the recommended and suggested readings on the unit Moodle site	Lab 7

Review/Exam Week - 09 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic

Exam Week - 16 Oct 2017

Module/Topic	Chapter	Events and Submissions/Topic

Term Specific Information

This is a condensed unit that runs from Weeks 6 -13, as most of you are on placement during the first 5 weeks of term. As this is a six credit unit, you are still expected to commit 150 hours to the unit, which equates to about 16.7 hours per week over the 9 weeks. There will be a total of seven (7) labs from Weeks 6 to 12. Take note that you are to adhere to the Course Dress Code when using the Medical Imaging simulation labs and a zero-tolerance policy will be followed.

Assessment Tasks

1 Imaging Equipment Testing

Assessment Type
Practical and Written Assessment

Task Description
This written assessment focuses on assessing performance of radiographic and ancillary equipment relative to quality standards; and troubleshooting for imaging faults and equipment problems. You will be required to work in your selected groups during the scheduled lab sessions to collect data for this assessment. You will be required to analyse the data and compare it to the relevant regulatory standard to assess the compliance of that unit and deduce if the equipment is operating properly or not. You will be presented with evidence (which may include radiographs and/or technical data) of an equipment problem. You will analyse the information provided to troubleshoot what the problem is and discuss possible implications of the problem on technical factor selection for specific clinical situations, image quality and patient absorbed dose. Although you will be working in your laboratory groups to collect the data for this assessment, this is an individual submission.
Your submission must be a word-processed document with appropriate layout including relevant headings and subheadings that enable information to be easily read. Acceptable file types are Word document (either .doc or .docx format) or pdf file that is a conversion of a word-processed document (NOT an image file such as a scanned document). All submissions must be processed through TURNITIN. Ensure that your document includes a header with your name and student number and a footer with the unit code and term/year. More details regarding the requirements for this assessment will be posted on the unit Moodle site.

Assessment Due Date
Week 10 Friday (22 Sept 2017) 3:00 pm AEST

Return Date to Students
Week 12 Friday (6 Oct 2017)

Two weeks after the test due date.

Weighting
40%

Assessment Criteria
The submitted work will be assessed on the following criteria:

- selection of the relevant standard
- correct determination of whether or not the dataset demonstrates compliance with regulatory standards
- identification of any abnormal aspect of the dataset
- application of legislated and promoted performances standards of professional groups
- consideration of tools typically available in clinical settings to test performance parameter under investigation and how these tools are typically used
- logic of the troubleshooting process
- factual correctness of responses
- ability to relate equipment operation issue to technical factor selection and image quality
- ability to relate equipment operation issue to patient dose
- communication and flow of the presented material
- adherence to posted instructions on document size, format and structure and on referencing content to external

sources

Further details will be posted on the unit Moodle site.

Referencing Style

- Harvard (author-date)

Submission
Online

Graduate Attributes

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

Learning Outcomes Assessed

- Assess radiographic images for various objective and subjective aspects of image quality.
- Relate radiographic equipment performance, use and technical parameter selection to patient dose and image quality.
- Justify the selection of technical parameters for a radiographic image in the context of the clinical circumstances.

2 In-class Test(s)

Assessment Type
In-class Test(s)

Task Description
This In-class test will be held during scheduled class time in Week 13. The purpose of this test is to assess your understanding of the topics related to Weeks 6 to 12 of the unit content as detailed in the posted weekly learning outcomes. There will be a mixture of recall, problem solving and application of concepts to imaging situations type questions.The total possible marks and the marks for each question will be indicated on the test paper.
Further details of the test breakdown and mark allocation will be made available on the unit Moodle site.
As per the Assessment Policy and Procedure (Higher Education Coursework), this In-class test must be written at the scheduled time. There is no ability to apply a late penalty. In the absence of an approved assessment extension, if you do not write the test at the scheduled time, your mark on the test will be zero.

Assessment Due Date

Review/Exam Week during timetabled classtime.

Return Date to Students

Results and feedback will be returned to students 2 weeks after the date of the test.

Weighting
60%

Minimum mark or grade
50 %

Assessment Criteria
Each question on the In-class test will indicate the number of marks per segment. Responses are scored based on:

- correct use of terminology
- factual correctness of explanations of concepts, including applications and illustration(s)
- relevance of stated content to the question asked
- application of theory concepts to the question asked
- clarity, thoroughness and completeness of explanations
- logic of problem-solving

Referencing Style

- Harvard (author-date)

Submission
Online

Graduate Attributes

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

Learning Outcomes Assessed

- Assess the performance of radiographic and ancillary equipment relative to quality standards.
- Troubleshoot imaging faults and equipment problems.
- Assess radiographic images for various objective and subjective aspects of image quality.
- Relate radiographic equipment performance, use and technical parameter selection to patient dose and image quality.
- Justify the selection of technical parameters for a radiographic image in the context of the clinical circumstances.

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