CHIR6410

Radiographic Science

Session 1, In person-scheduled-weekday, North Ryde 2024

Department of Chiropractic

Contents

General Information

Unit convenor and teaching staff
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Credit points
10

Prerequisites Admission to MChiroprac
Corequisites
Co-badged status
Unit description This unit is conducted to develop your knowledge in the underlying physical principles of medical radiation science and radiographic image production to prepare you for further study in diagnostic radiology. The unit includes key components of radiation physics, image production, and image processing to provide you with an understanding of the use and application of medical diagnostic radiography. You will be introduced to the biological effects of radiation and related safety concerns and radiation protection techniques. Finally, you will apply your knowledge of musculoskeletal anatomy and concepts of radiographic image production to identify normal anatomical appearance, including common variations, on radiographic images of the spine and extremities.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

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

ULO1: Identify the properties of x-rays and explain how they interact with matter, influence image quality, and inform patient safety standards

ULO2: Explain the working principles of diagnostic imaging modalities and how they influence image production

ULO3: Critically appraise the principles of radiographic image production and processing

ULO4: Summarise the biological effects of radiation and explain the importance of radiographic protection in relation to radiography

ULO5: Recognise, identify, and assess normal radiographic anatomy of the musculoskeletal system and be able to explain variations in appearance due to radiographic technique.

General Assessment Information

Grade descriptors and other information concerning grading are contained in the Macquarie University Assessment Policy.

All final grades are determined by a grading committee, in accordance with the Macquarie University Assessment Policy, and are not the sole responsibility of the Unit Convenor.

Students will be awarded a final grade and a mark which must correspond to the grade descriptors specified in the Assessment Procedure (clause 127-8).

To pass this unit, you must demonstrate sufficient evidence of achievement of the learning outcomes, meet any ungraded requirements, and achieve a final mark of 50 or better.

Further details for each assessment task will be available on iLearn.

Late Submissions

Unless a Special Consideration request has been submitted and approved, a 5% penalty (OF THE TOTAL POSSIBLE MARK) will be applied each day a written assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. Submission time for all written assessments is set at 11.55pm. A 1-hour grace period is provided to students who experience a technical concern.

For example:

Number of days (hours) late	Total Possible Marks	Deduction	Raw mark	Final mark
1 day (1-24 hours)	100	5	75	70
2 days (24-48 hours)	100	10	75	65
3 days (48-72 hours)	100	15	75	60
7 days (144-168 hours)	100	35	75	40
>7 days (>168 hours)	100	-	75	0

For any late submissions of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, students need to submit an application for Special Consideration.

Assessment Tasks

Name	Weighting	Hurdle	Due
Online quiz 1	25%	No	Week 8, 14 April 11:55pm
Online quiz 2	15%	No	Week 11, 19 May 11:55pm

Name	Weighting	Hurdle	Due
Normal radiographic anatomy portfolio	10%	No	Multiple submissions throughout the session. Date on iLearn.
Final theory exam	50%	No	University Exam Period

Online quiz 1

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 16 hours
Due: **Week 8, 14 April 11:55pm**
Weighting: **25%**

Online quiz on material covered in lectures and tutorial sessions on radiographic physics and the biological effects of radiation

On successful completion you will be able to:

- Identify the properties of x-rays and explain how they interact with matter, influence image quality, and inform patient safety standards
- Explain the working principles of diagnostic imaging modalities and how they influence image production
- Summarise the biological effects of radiation and explain the importance of radiographic protection in relation to radiography

Online quiz 2

Assessment Type [1]: Quiz/Test
Indicative Time on Task [2]: 10 hours
Due: **Week 11, 19 May 11:55pm**
Weighting: **15%**

Online quiz on material covered in image formation lectures and tutorial sessions

On successful completion you will be able to:

- Explain the working principles of diagnostic imaging modalities and how they influence image production
- Critically appraise the principles of radiographic image production and processing

Normal radiographic anatomy portfolio

Assessment Type [1]: Portfolio
Indicative Time on Task [2]: 10 hours
Due: **Multiple submissions throughout the session. Date on iLearn.**
Weighting: **10%**

Students will create a portfolio of radiographic images for each region of the spine and extremities covered in the online modules, selected for variation in the appearance of normal anatomy. A description will accompany each image including the anatomy identified and an explanation of the reason for the variation in normal appearance. A random subset of portfolio entries will be marked to a standardised rubric.

On successful completion you will be able to:

- Recognise, identify, and assess normal radiographic anatomy of the musculoskeletal system and be able to explain variations in appearance due to radiographic technique.

Final theory exam

Assessment Type [1]: Examination
Indicative Time on Task [2]: 25 hours
Due: **University Exam Period**
Weighting: **50%**

The exam will assess material from the whole semester

On successful completion you will be able to:

- Identify the properties of x-rays and explain how they interact with matter, influence image quality, and inform patient safety standards
- Explain the working principles of diagnostic imaging modalities and how they influence image production
- Critically appraise the principles of radiographic image production and processing
- Summarise the biological effects of radiation and explain the importance of radiographic protection in relation to radiography
- Recognise, identify, and assess normal radiographic anatomy of the musculoskeletal system and be able to explain variations in appearance due to radiographic technique.

[1] If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the Writing Centre for academic skills support.

[2] Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

As a student enrolled in this unit, you will engage in a range of in-person and online learning activities described below:

LECTURES

2-hour weekly lectures that will be a mix of online and in-person lectures, as well as flipped classroom sessions held on Thursdays 1-3pm.

TUTORIAL SESSIONS

9 x 1-hour tutorial sessions per student as scheduled. Tutorial content will alternate between radiographic physics and normal radiographic anatomy. The schedule will be released and made available on the iLearn page early in the Session.

iLEARN PAGE

The web page for this unit can be found at: https://ilearn.mq.edu.au and following the links for either Postgraduate or Undergraduate students. There is a combined iLearn page for HLTH3140 and CHIR6410 students which will contain all unit information. There will be a separate CHIR6410 iLearn page to just hold your assessment results (this is due to how the University systems handle co-taught units such as this).

RECOMMENDED READINGS

- Radiologic science for technologists: physics, biology, and protection. Bushong, Stewart C. (Stewart Carlyle), author. Eleventh edition. St. Louis, Missouri: Elsevier 2017

ADDITIONAL READINGS

- Essentials of radiologic science. Fosbinder, Robert.; Orth, Denise. Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins 2012

- Principles of radiological physics. Graham, Donald T.; Cloke, Paul J. 4th ed. Edinburgh: Churchill Livingstone 2003
- Introduction to Radiologic Technology. LaVerne Tolley Gurley & William J. Callaway (7th Edition); Mosby St Louis 2011

TECHNOLOGY USED

Active participation in the learning activities throughout the unit will require students to have access to a tablet, laptop or similar device. Students who do not own their own laptop computer may borrow one from the university library.

Unit Schedule

See iLearn for a detailed unit schedule.

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Assessment Procedure
- Complaints Resolution Procedure for Students and Members of the Public
- Special Consideration Policy

Students seeking more policy resources can visit Student Policies (https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit Policy Central (https://policies.mq.edu.au) and use the search tool.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/admin/other-resources/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the

University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe academic integrity – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free online writing and maths support, academic skills development and wellbeing consultations.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://students.mq.edu.au/support/

The Writing Centre

The Writing Centre provides resources to develop your English language proficiency, academic writing, and communication skills.

- Workshops
- Chat with a WriteWISE peer writing leader
- Access StudyWISE
- Upload an assignment to Studiosity
- Complete the Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

Student Services and Support

Macquarie University offers a range of Student Support Services including:

- IT Support
- Accessibility and disability support with study
- Mental health support
- Safety support to respond to bullying, harassment, sexual harassment and sexual assault
- Social support including information about finances, tenancy and legal issues
- Student Advocacy provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via AskMQ, or contact Service Connect.

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Inclusion and Diversity

Social inclusion at Macquarie University is about giving everyone who has the potential to benefit from higher education the opportunity to study at university, participate in campus life, and flourish in their chosen field. The University has made significant moves to promote an equitable, diverse, and exciting campus community for the benefit of staff and students. It is your responsibility to contribute towards the development of an inclusive culture and practice in the areas of learning and teaching, research, and service orientation and delivery. As a member of the Macquarie University community, you must not discriminate against or harass others based on their sex, gender, race, marital status, carers' responsibilities, disability, sexual orientation, age, political conviction, or religious belief. All staff and students are expected to display appropriate behaviour that is conducive to a healthy learning environment for everyone.

Professionalism

In the Faculty of Medicine, Health and Human Sciences, professionalism is a key capability embedded in all our courses.

As part of developing professionalism, students are expected to attend all small group interactive sessions including clinical, practical, laboratory, work-integrated learning (e.g., PACE placements), and team-based learning activities. Some learning activities are recorded (e.g., face-to-face lectures), however, you are encouraged to avoid relying upon such material as they do not recreate the whole learning experience, and technical issues can and do occur. As an adult learner, we respect your decision to choose how you engage with your learning, but we would remind you that the learning opportunities we create for you have been done so to enable your success and that by not engaging you may impact your ability to complete this unit. We equally expect that you show respect for the academic staff who have worked hard to develop meaningful activities and prioritise your learning by communicating with them in advance if you are unable to attend a small group interactive session.

Another dimension of professionalism is having respect for your peers. It is the right of every student to learn in an environment that is free of disruption and distraction. Please arrive to all learning activities on time, and if you are unavoidably detained, please join the activity as quietly as possible to minimise disruption. Phones and other electronic devices that produce noise and other distractions must be turned off before entering class. Where your own device (e.g., laptop) is being used for class-related activities, you are asked to close down all other applications to

avoid distraction to you and others. Please treat your fellow students with the utmost respect. If you are uncomfortable participating in any specific activity, please let the relevant academic know.

Unit information based on version 2024.01R of the Handbook