THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

MEDICAL AND HEALTH SCIENCES

MEDIMAGE 714
FUNDAMENTALS OF CLINICAL MRI

15 points
Semester 1 or Semester 2, 2018

Course Description

Provides a fundamental understanding of MRI technology and applications and addresses scientific principles of the modality including resonance and relaxation, image contrast, spatial encoding and digital image formation. Students will examine components of the clinical environment including MRI equipment, contrast agents, bio-effects and safety. In addition, students will analyse standard imaging protocols of the lumbar spine, knee and brain and normal and abnormal MR imaging appearances of these areas.

Objectives of the Course

This course aims to provide students with specialised theoretical knowledge and an understanding of the fundamental physical principles of MR technology. The student will develop the ability to apply this knowledge in the safe use of MRI equipment for clinical and/or research purposes. In particular, this course will investigate common pathologies and the use of standard protocols in relation to a selection of common MR imaging applications.

Learning Outcomes

1. Demonstrate an understanding of theoretical concepts relating to MR technology.
2. Critically discuss specific issues relating to bio-effects and safety within the MR environment.
3. Differentiate and explain normal and altered MR imaging appearances of the lumbar spine, knee and brain.
4. Make informed clinical judgements with regard to the selection of standard imaging protocols and technical parameters in relation to the lumbar spine, knee and brain.
5. Apply an evidence-based approach to clinical decision-making and problem solving.

Teaching Staff

Adrienne Young
Course Coordinator
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Programme and Course Advice

This course is the first compulsory course within the PGDipHSc(MRI) and is a pre-requisite for all of the other MRI-specific courses.

Students from the PGDipHSc(Ultrasound), PGDipHSc/PGCertHSc (Medical Imaging) and PGCertHSc (Mammography) programmes may choose this course as an elective.

All Medical Imaging Technologists and students admitted to any one of the above programmes are eligible for direct entry to this course. For all other students, departmental approval is required and a concession request must be submitted when applying to enrol in this course. Access to a clinical MRI department is highly recommended.

Course Delivery

This course is offered in both semesters, enabling students the flexibility of enrolling in either semester 1 or semester 2.

This course is delivered fully online by distance via the University of Auckland's learning management system 'Canvas'. It will incorporate a range of learning approaches including videos, webpages, links to the library databases and resources, and utilising online technologies to promote shared learning opportunities.

Students are urged to discuss privately any impairment-related requirements face-to-face and/or in written form with the Course Coordinator.

Workload and contact hours

The total expected workload for this course is approximately **150 hours**. This may be broken down as follows:

- Set readings relevant to MRI theory and clinical practice (40 hours)
- Other resources provided on Canvas e.g. videos, websites (10 hours)
- Assignments and self-directed learning (100 hours)

Communication

All official communication to a student will be sent to the student's current University email address (username@aucklanduni.ac.nz) and the student is responsible for ensuring that any desired forwarding to other addresses is in place and operating correctly. Staff will not be responsible for any consequences if students fail to read and respond to University correspondence in a timely manner.

Students are encouraged to use the course discussion forum as much as possible for communication with staff and other students. Email may be used for more private matters. Staff will endeavour to respond to email queries as soon as possible.

Course Textbooks

The **required textbooks** for this course are:

Workbook for sectional anatomy for imaging professionals (3rd ed.)
Lorrie Kelley and Connie Petersen
St. Louis: Elsevier/Mosby c2012

MRI: From picture to proton (3rd ed.)
Donald McRobbie, Elizabeth Moore and Martin Graves
Cambridge, UK : Cambridge University Press c2017

Students will be required to ***purchase a copy*** of the sectional anatomy workbook. Access to the corresponding textbook **'Sectional anatomy for imaging professionals'** (3rd ed.) by the same authors would be helpful although the information required to complete the workbook is available in a range of other textbooks. Students may choose to purchase a copy of McRobbie et al. (3rd edition, 2017) or access a workplace or library copy. A large selection of other resources will be able to be accessed online via the course website and the Philson Library databases.

Pre-Course Reading

It is highly recommended that students access the following two online textbooks via the Philson Library and read 'Chapter 1: What's the attraction?' and 'Chapter 2: Early daze: your first week in MR' from McRobbie et al., and 'Chapter 1: Basic principles' from Westbrook and Kaut-Roth as preparatory pre-reading for this course. This will be assumed prior knowledge when you begin the course:

MRI: From picture to proton (3rd ed.)
Donald McRobbie, Elizabeth Moore, Martin Graves and Martin Prince
Cambridge, UK : Cambridge University Press c2017

MRI in practice (4th ed.)
Catherine Westbrook, Carolyn Kaut-Roth and John Talbot
Chichester, West Sussex ; Malden, MA : Wiley-Blackwell 2011

Assessment

An aggregated mark of 50% or more is required to successfully pass this course. Resubmission of failed assessments is not permitted. Penalties for excessive word count and/or late submission (without prior written approval for an extension) will be applied in accordance with the 'Medical Imaging Assessment Requirements and Presentation Criteria' document.

The following is indicative of the type of assessments to be completed for this course:

- Short Answer Questions 20%
- PeerWise MCQs 20%
- Clinical Decision-Making Portfolio 40%
- MCQ and Image Evaluation Test 20%

Academic Integrity

The University of Auckland will not tolerate cheating, or assisting others to cheat, and views cheating in coursework as a serious academic offence. The work that a student submits for grading must be the student's own work, reflecting his or her learning. Where work from other sources is used, it must be properly acknowledged and referenced. This requirement also applies to sources on the world-wide web. All students' assessed work will be reviewed against electronic source material using computerised detection mechanisms.

Student Feedback

Assessments will be marked, moderated and returned within 3 weeks of submission, with the possible exception of the last course assessment which will be returned after the Board of Examiners meeting. Feedback will be provided on all assessments in the form of a marking rubric and/or individual or class comments. This feedback will be accessed via email or Canvas as identified by the Course Coordinator.

At the end of this course, feedback from students may be requested in the form of an online course evaluation survey.

Disclaimer

Although every reasonable effort is made to ensure accuracy, the information in this document is provided as a general guide only for students and is subject to alteration.

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