



**A- COURSE TITLE, CODE, ACADEMIC YEAR:**

**MAGNETIC RESONANCE IMAGING 2 (RAD-462) 1437-1438H**

**B- COURSE INFORMATION:**

Course Code	Course Title	Credit Units			Study Level	Pre-requisites
		Total	Theory	Practical		
RAD-462	Magnetic Resonance Imaging (2)	3	-	-	8 <sup>th</sup>	RAD-461
Course Coordinator		Extension		Email Address		
Dr. Kamal Dahan Al-Sultan				kdsultan@taibahu.edu.sa		

**C- COURSE DESCRIPTION:**

The course is designed to provide the student with MRI imaging techniques related to the central nervous system (CNS), neck, thorax, musculoskeletal system and abdomino-pelvic regions. The content covers specific clinical application, coils that are available and their use, considerations in the scan sequences, specific choices in the protocols (e.g., slice thickness, phase direction and flow compensation), and positioning criteria. Anatomical structures and the plane that best demonstrates anatomy are discussed as well as signal characteristics of normal, abnormal, image artifact and pitfalls. Overview of MRI image interpretation will be also covered.

**D- COURSE OBJECTIVES:**

1. Describe considerations in designing an imaging protocol and state the application of protocols in specific situations and the coils available for MR and their specific application.
2. Demonstrate proper patient screening and state tissue signal characteristics of anatomical structures with and without contrast.
3. Identify the common indications and common pathology for different organs imaging.
4. Demonstrate and apply MRI techniques related to the central nervous system (CNS), neck, thorax, musculoskeletal system and abdominopelvic regions.
5. Explain the use of contrast media in evaluating pathology.
6. Describe the criteria for imaging windows for different areas of the body.
7. Demonstrate effective communication skills with patients, their family members and staff.
8. Apply MR safety and protective practices associated with MR examinations.
9. Identify the normal and the abnormal anatomic location of the soft tissue structures of the head and face, orbit, nasopharynx, oropharynx, neck, spine, and vasculature of the neck, abdomen and pelvis on scan images.
10. Discuss and apply the various saturation techniques used in breast imaging, and normal and abnormal appearance.

**D- THEORY TOPICS:**

N of Weeks	Theory Topic	Hours



1	Imaging Considerations	2
1	Imaging Planes:	2
1	Signal Characteristics	2
1	General Considerations	2
2	Considerations for Routine MR Procedures	4
2	MRI procedure of the central nervous system	4
2	MRI of the musculoskeletal system	4
1	MR/MRA of the abdomen and pelvis	2
1	MR/MRA of the thorax Clinical indications and Anatomic locations	2
1	Pediatric MRI/MRA, Clinical indications and anatomical location	2
1	Procedural Considerations for Contrast Studies	2
1	Image artifact and pitfalls	2

#### E- PRACTICAL SESSIONS:

N of Weeks	Practical Session	Hours
1	Imaging Considerations	2
1	Imaging Planes:	2
1	Signal Characteristics	2
1	General Considerations	2
2	Considerations for Routine MR Procedures	4
2	MRI procedure of the central nervous system	4
2	MRI of the musculoskeletal system	4
1	MR/MRA of the abdomen and pelvis	2
1	MR/MRA of the thorax Clinical indications and Anatomic locations	2
1	Pediatric MRI/MRA, Clinical indications and anatomical location	2
1	Procedural Considerations for Contrast Studies	2
1	Image artifact and pitfalls	2

#### F- ASSESSMENT TASKS:

#	Type of assessment task	Week	Total Grades
1	Assignments ( quizzes, seminars, homework sect)	Over the course period	10%



2	Written Test (1)	8	20%
3	Written Test (2)	13	20%
4	Final Exam (Practical)	14	10%
5	Final Exam (theoretical)	16	40%

#### **G- LEARNING RESOURCES:**

##### 1- Required textbook:

- Val M. Rung (2002). Clinical MRI. Saunders. Catherine Westbrook, Carolyn Kaput Roth & John Talbot (2005). MRI in practice. 3rd edition, Wiley- Blackwell

##### 2- Essential references:

- Bernstein M.A., King K.F., Zhou X.J. (2004). Handbook of MRI Pulse Sequences, Academic Press. ISBN: 0-120-92861-2.
- Bankman I. (2000). Handbook of Medical Imaging: Processing and Analysis, Academic Press. ISBN 0-120-77790-8.