The Hashemite University
Faculty of Allied Health Sciences
Department of Medical Imaging
Course Syllabus

Course information	
Course Title	Magnetic Resonance Imaging (02)
Course Code	140508435
Prerequisites	140508332
Credit Hours	3 (2 Theory + 3 Lab hours)
Course Description	
This course covers advanced and clinical MRI topics such as fast imaging techniques (fast gradient echo, fast spin echo, Echo planar imaging EPI, parallel imaging), tissue suppression techniques, MR artifacts, MR contrast agents, chemical shift imaging, magnetization transfer imaging, diffusion imaging, functional MRI, flow imaging, MR angiography, cardiac gated imaging, clinical imaging protocols, and in vivo NMR spectroscopy	
Course Objectives By the end of this course, student is expected to:	
Be able to understand the fast MR imaging techniques	
Be able to understand the different types of MR image artifacts and their manipulation	
Be able to understand the basic principles of different advanced imaging techniques	
Be able to link between the clinical situation and suitable imaging procedure.	
Recommended Textbook	
Title	MRI from picture to proton
Author	Donald McRobbie, Elizabeth Moore, Martin Graves, Martin Prince
Publisher	Cambridge
Year	2008
Edition	Second
Other References	
Title	Clinical MR Imaging: A Practical Approach
Author	P. Reimer · P.M. Parizel · F.-A. Stichnoth
Publisher	Springer
Year	2006
Edition	Second
Title	MRI in practice
Author	Catherine Westbrook, Carolyn Roth, John Talbot
Publisher	Blackwell
Year	2005
Edition	Third
Title	MRI the Basics
Author	Ray Hashemi, William Bradlly, Christopher Lisanti
Publisher	Lippincott Williams and Wilkins
Year	2010
Edition	Third
Website	http://www.cis.rit.edu/htbooks/mri/
Website	http://www.imaios.com/en/e-Courses/e-MRI/
Website	http://www.mr-tip.com/serv1.php
Website	http://www.mritutor.org/
Website	http://www.revisemri.com/
Website	http://medicalphysicist.co.uk/mriportfolio.htm
Website	http://www.ismrm.org/mr_sites.htm

Website	http://www.users.on.net/~vision/
Website	http://www.mrisafety.com/
Website	http://www.refindia.net/rlinks/reviewedlinks/functional_MRI.htm
Website	http://psychology.uwo.ca/fmri4newbies/
Website	http://www.eecs.umich.edu/~dnoll/primer2.pdf

Course Contents

Part One: Imaging Pulse Sequences and Image Artifacts

- Gradient echo-Based Imaging Sequences
- Spin echo-Based Imaging Sequences
- Echo Planar Imaging (EPI)
- Parallel Imaging
- Tissue suppression techniques
- MR image artifacts
- MR Contrast Agents

Part Two: MR Advanced Applications

- Diffusion Imaging
- Flow, Cardiac Imaging and MR Angiography
- Functional MRI (fMRI)
- MR spectroscopy (MRS)
- Magnetization Transfer (MT) Imaging

Part Three: Clinical Applications (Protocols)

- Brain MRI
- Spine MRI
- Joints MRI
- Abdomen MRI
- Pelvis MRI

Assessment

First Exam	20%
Second Exam	20%
Lab + In course assessment	20%
Final Exam	40%