



TEHRAN UNIVERSITY
OF
MEDICAL SCIENCES

School of Allied Medical Sciences

Course Description Guide

**Ph.D. by Research in Medical Imaging Technology
(Radiology Technology)**

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(Radiology Technology)**

Course Description

Code	Subject	Credits		
		Theory	Practical	Total
01	Advanced Physics and Methods of CT Scans Medical Imaging Systems	2	-	2
02	Advanced Physics and Methods of MRI Medical Imaging Systems	3	-	3
03	Advanced Dosimetry and Radiation Protection in Radiology	2	-	2
04	Image Interpretation in Radiology	2	-	2
05	Thesis	30	-	30
Total		39		

Advanced Physics and Methods of CT Scans Medical Imaging Systems

Course Code: 01

Number of Credits: 02

Course Type: Theory

Principal Objective(s) of the Course: Increasing the knowledge of students about advanced physics of CT scans as well as the advanced methods of tomography imaging modalities and image reconstructions.

Course Description: Students will get deep insight about the advanced physics and methods of CT scan, and do the image reconstructions for obtaining better quality images.

This Course Includes: Data Acquisition, Image Reconstruction, Image Display, Data collection methods, image quality, image post-processing, data informatics and management, CT-angiography. Advance methods of cranial, vertebral columns (cervical, thoracic and lumbosacral), abdominal, muscular-skeletal and angiography.

Student Assessment Practices: Continuous evaluations during the course, final course exam, lectures, group discussion, with the use of new auditory and visionary methods.

Advanced Physics and Methods of MRI Medical Imaging Systems

Course Code: 02

Number of Credits: 03

Course Type: Theory

Principal Objective(s) of the Course: Increasing the knowledge of students about advanced physics of MRI as well as the advanced methods of MRI systems and image reconstructions.

Course Description: Students will get deep insight about the advanced methods of MRI of different body parts and different techniques of imaging on the base of the kinds of sickness and need.

This Course Includes: Physics of NMR, NMR signals and contrast, spatial coding in MRI, MRI sequences, contrast optimization, image quality and artifacts, MR Angiography, methods of Neuroimaging, MSK and sport imaging, body imaging, angiography, venography, etc.

Student Assessment Practices: Continuous evaluations during the course, final course exam, lectures, group discussion, with the use of new auditory and visionary methods.

Advanced Dosimetry and Radiation Protection in Radiology

Course Code: 03

Number of Credits: 02

Course Type: Theory

Principal Objective(s) of the Course: Increasing the knowledge of students about advanced dosimetry as well as the advanced methods of radiation protection.

Course Description: Students will get deep insight about the advanced dosimetry systems as well as deep understanding in knowledge of ionizing radiation related risks and radiation protection principles in medical imaging.

This Course Includes: Radiation quantities and units, radiation monitoring (dosimetry protocols) dosimetry devices: OSL, TLD, film, patient dose assessment, shielding and X-ray facility design optimization of protection in: radiography, fluoroscopy, interventional radiology, CT, mammography, digital radiology, pediatrics.

Student Assessment: Practices Continuous evaluations during the course, final course exam, lectures, group discussion, with the use of new auditory and visionary methods.

Image Interpretation in Radiology

Course Code: 04

Number of Credits: 02

Course Type: Theory

Principal Objective(s) of the Course: Increasing the knowledge of students' image interpretation in CT and MRI.

Course Description: It is expected that by the end of the course, student will become more accurate in their interpretation skills of CT and MR images.

This Course Includes: CT and MR image interpretation for Brain (congenital, phakomatosis, degenerative diseases, demyelinating, infection, and trauma), hand (joint, shoulder, wrist), chest (cardiac-infection, lungs, mediastinum, aorta, breast, and trauma), hip, bony pelvic, etc.

Student Assessment: Practices Continuous evaluations during the course, final course exam, lectures, group discussion, with the use of new auditory and visionary methods.

Thesis Description

Code of Course: 05

Number of Credits: 30

Course Type: Research (Theory and Practical)

Principle Objective: It is expected by the end of the module, student will become professionally qualified in his/her thesis topic.

Course Description: It would be a substantial, original research project for the duration of the degree, under the supervision and guidance of two or more academic members of staff. The supervisory team provides guidance both in the selection of a research topic and in the conduct of the research.

Student Assessment: Oral examination (Viva Session). After the thesis is finished and before it is submitted to the university, there will be a presentation (often public) by the student and questions posed by an examining committee or jury.