# Syllabus*: Internship in Medical Imaging (2) 140508453 First Semester 2022-/2023-

| COURSE INFORMATION | |
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| **Course Name:** Internship in Medical Imaging (2)<br>**Semester:** First<br>**Department:** Department of Medical Imaging<br>**Faculty:** | **Course Code:** 140508452<br>**Section:**<br>**Core Curriculum**: |
| **Day(s) and Time(s):** 8 -2 (Sunday , Tuesday ,Thursday)<br>**Classroom:** Ministry of Health and Royal Medical services Hospitals | **Credit Hours:** 6<br>**Prerequisites**: 140508434 & 140508435 |

## COURSE DESCRIPTION

The internship in Medical Imaging offers students the chance to practice performing different conventional and advanced imaging procedures for different body parts using conventional x-ray machines. In addition, student will practice performing x-ray radiographic procedures to some extent.

## DELIVERY METHODS

The course will be delivered through a combination of active learning strategies. These will include:

- Collaborative learning through small groups acting in an interdisciplinary context.
- Relevant films and documentaries
- Video lectures
- E-learning resources: e-reading assignments and practice quizzes through Model and Microsoft Team

| FACULTY INFORMATION | |
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| **Name** | Manar AL-Mohammad |
| **Academic Title:** | **Lecturer** |
| **Office Location:** | Medical imaging department office number 3158 |
| **Telephone Number:** | |
| **Email Address:** | manaralmohammed@yahoo.com , manary@hu.edu.jo |
| **Office Hours:** | **Tuesday** 10:00-11:00<br>**Monday** 9:00-11:00<br>**Wednesday** 8:00-9:00<br>*Please send an e-mail (manary@hu.edu.jo) to meet at any other time.* |

## REFERENCES AND LEARNING RESOURCES

**Required Textbook:** List book or state: There is no required textbook for purchase. All compulsory weekly readings are available electronically on Model.

Author ***Title*** (Publisher: 2009) ISBN: 1-4039-742x-x **Suggested Additional Resources**:

**Useful Web Resources**: http://www.

## STUDENT LEARNING OUTCOMES MATRIX*

| Core Curriculum Learning Outcomes | Program Learning Outcomes | Course Objectives | Course Student Learning Outcomes | Assessment Method |
|---|---|---|---|---|
| Communicate with others RTs in the hospitals | KP1: Develop an understanding of human anatomy and physiology as it relates to health and disease and acquire competency in medical terminology, documentation<br>KP2: Understand the principles and physics of medical imaging technologies such as general X-ray, CT, MRI, ultrasound, fluoroscopy, nuclear medicine, dental radiography, and mammography and relate medical research<br>KP3: Develop and implement protocols for medical imaging procedures, including patient positioning, patient care, proper exposure factor selection, appropriate radiation protection measures, demonstrating technical competence, and the use of contrast agents<br><br>SP1: Demonstrate depth of knowledge and integrate it of the basic scientific principles of all | Understanding the work mechanism for the x-rays , MRI and CT scanners. | Use theX-rays, MRI and CT scanners professionally and efficiently. | • Exams<br>• Oral evaluation |
| Develop the skills of the dealing with the patients. | | Knowing the anatomy of the body and know how to see it in the x-rays, MRI and CT scanners | Acquire x-rays, MR and CT images of different parts of the body. | • Exams<br>• Oral evaluation |
| Review the technical factors and apply it on different studies | | Thoroughly explain the effect of most imaging parameters on image quality. | Select the technical factors for different radiographic, CT, and MRI procedures. | • Exams<br>• Oral evaluation |
| Apply different factors which help to reduce the image artifacts | | Knowing different types of artifacts that can effect the image quality | Understand the causes and remedies of different x-rays, MR and CT image artifacts | • Exams<br>• Oral evaluation |
| Cooperate with other RTs to develop their skills of dealing with patients. | | Knowing the different positions to take the best image | Able to position the patient inside the scanner safely and professionally. | • Exams<br>• Oral evaluation |
| Obtain the ways of radiation protection | | Understanding the principles of radiation safety | Practice the x-rays, MRI safety and CT radiation protection | • Exams<br>• Oral evaluation |

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| Show excellent communication with patients and staff | medical imaging technologies for the implementation of various protocols and techniques and to conduct scientific research in this field<br>SP2: Use creativity, critical thinking, analysis, and research skills to modify standard procedures to adapt to new circumstances, difficult cases, or unusual situations while maintaining appropriate medical imaging quality.<br>SP3: Evaluate and criticize all types of medical images<br><br>CP1: Access, evaluate, and provide medical imaging requirements<br>CP2: Recognizing the need to learn from professional learning, managing learning in the field of medical imaging in an integrated manner, and acquiring continuous learning skills<br>CP3: Demonstrate professional identity and responsibility with patients, colleagues, employers, and society, with ethical and professional behaviors and attitudes in the practice of health care.<br>CP4: Produces high quality, diagnosable medical images by applying positioning skills, selecting technical parameters, and using radiation | Understanding the types of hazards can effect the patient and staff. | Able to protect the patient and staff from any potential hazards of using the x-rays, MRI and CT scanners | • Exams<br>• Oral evaluation |
| Able to solve any technical problems occur during procedures | | Able to optimize the imaging protocol to fulfill the needs of the clinical question | Able to solve the common problems related to data acquisition. | • Exams<br>• Oral evaluation |
| Demonstrate use of conventional and digital medical imaging equipments. | | Demonstrate appropriate use of conventional and digital medical imaging equipments | Apply the radiographic positioning skills to perform different radiographic procedures for the skull, spine, chest, abdomen, and pelvis, upper and lower extremities in addition to the contrast media-based radiographic procedures. | • Exams<br>• Oral evaluation |
| Knowing pathologies and the correct protocol to show it . | | Appropriately evaluate x-ray, CT and MR images. | Demonstrate effective presentation skills and written communication skills. | • Exams<br>• Oral evaluation |

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| | protection. | | | |

## ACADEMIC SUPPORT

It is The Hashemite University policy to provide educational opportunities that ensure fair, appropriate and reasonable accommodation to students who have disabilities that may affect their ability to participate in course activities or meet course requirements. Students with disabilities are encouraged to contact their Instructor to ensure that their individual needs are met. The University through its Special Need section will exert all efforts to accommodate for individual's needs.

**Special Needs Section:**
**Tel:**
**Location:**
**Email**:

## COURSE REGULATIONS

***Participation***

Class participation and attendance are important elements of every student's learning experience at The Hashemite University, and the student is expected to attend all classes. A student should not miss more than 15% of the classes during a semester. *Those exceeding this limit of 15% will receive a failing grade regardless of their performance*. It is a student's responsibility to monitor the frequency of their own absences. **Attendance record begins on the first day of class irrespective of the period allotted to drop/add and late registration. It is a student's responsibility to sign-in; failure to do so will result in a non-attendance being recorded.**

In exceptional cases, the student, with the instructor's prior permission, could be exempted from attending a class provided that the number of such occasions does not exceed the limit allowed by the University. The instructor will determine the acceptability of an absence for being absent. A student who misses more than 25% of classes and has a valid excuse for being absent will be allowed to withdraw from the course.

***Late or Missed Assignments***

In all cases of assessment, students who fails to attend an exam, class project or deliver a presentation on the scheduled date without prior permission, and/or are unable to provide a medical note, will automatically receive a fail grade for this part of the assessment.

- Submitting a term paper on time is a key part of the assessment process. Students who fail to submit their work by the deadline specified will automatically receive a 10% penalty. Assignments handed in more than 24 hours late will receive a further 10% penalty. Each subsequent 24 hours will result in a further 10% penalty.
- In cases where a student misses an assessment on account of a medical reason or with prior permission; in line with University regulations an incomplete grade for the specific assessment will be awarded and an alternative assessment or extension can be arranged.

***Student Complaints Policy***

Students at The Hashemite University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the students' handbook.

## COURSE ASSESSMENT

***Course Calendar and Assessment***

Students will be graded through the following means of assessment and their final grade will be calculated from the forms of assessment as listed below with their grade weighting taken into account. The criteria for grading are listed at the end of the syllabus

| Assessment | Grade Weighting | Deadline Assessment |
|---|---|---|
| | | |
| Exam 1 | 15% | |
| Exam 2 | 15% | |
| Oral evaluation | 20% | |
| Final practical | 20% | |
| Final Exam | 30% | |

**Description of Exams**

Test questions will predominately come from material presented in the lectures. Semester exams will be conducted during the regularly scheduled lecture period. Exam will consist of a combination of multiple choice, short answer, match, true and false and/or descriptive questions.

**Homework:** Will be given for each chapter, while the chapter in progress you are supposed to work on them continuously and submit in next lecture when I finish the chapter.

You are also expected to work on in-chapter examples, self-tests and representative number of end of chapter problems. The answers of self-tests and end of chapter exercises are given at the end of the book.

**Quizzes:** Unannounced quizzes will be given during or/and at the end of each chapter based upon the previous lectures. It will enforce that you come prepared to the class.

No make-up exams, homework or quizzes will be given. Only documented absences will be considered as per HU guidelines.

Grades are not negotiable and are awarded according to the following criteria*:

| Letter Grade | Description | Grade Points |
|---|---|---|
| A+ | Excellent | 4.00 |
| A | | 3.75 |
| A- | | 3.50 |
| B+ | Very Good | 3.25 |
| B | | 3.00 |
| B- | | 2.75 |
| C+ | Good | 2.50 |
| C | | 2.25 |
| C- | | 2.00 |
| D+ | Pass | 1.75 |
| D | Pass | 1.50 |
| F | Fail | 0.00 |
| I | Incomplete | - |

## *Evaluation Form Computed Tomography (CT)*

| | | | |
|---|---|---|---|
| **1) Requisition**<br>❖ State the patient's name, sex and age<br>❖ Identify the procedures to be performed<br>❖ Note any pathological conditions listed | ..... .1.0 **Mark(s)** | **5) Correct selection of technical factors**<br>❖ Enter patient information on the scanner<br>❖ Choose the correct imaging parameters and protocol (KVP, MAS, Pitch, Kernel, Slice Thickness)<br>❖ Able to scroll throughout the resultantimages | ..... **Mark(s)** 1.0 |
| **2) Patient care & safety**<br>❖ Take care of patient<br>❖ Ask general safety questions CM sensitivity...etc.,<br>❖ Use the protective shielding<br>❖ Make sure eyes closed while laser light 'ON'<br>❖ Door is closed<br>❖ Ask female patients between the ages12-60 years old, if they might possible be pregnant<br>❖ Observing the patient during scanning | ..... ... 6.0 **Mark(s)** | **6) Slice planning**<br>❖ Plan slices correctly on scout (survey) image as well as subsequent images to produce the requested images in the rightimaging plane<br>❖ Use enough number of slices that cover the area of interest taking into the shortestpossible scanning time<br>❖ Correct slice angulations (tilting) | ..... **Mark(s)** 3.0 |
| **3) Explanation**<br>❖ Explain the procedure to the patient in general terms<br>❖ Give the patient general guidelines and precautions<br>• Motion<br>• Duration of scan<br>• Assuring the patient that we will be watching him/her during the exam<br>• Breathing instructions<br>• Contrast media ( heating) | ..... 5.0 **Mark(s)** | **7) Efficiency use of time & energy**<br>❖ Performed tasks in an efficient order (pt.info. entered in advance)<br>❖ Use the minimum possible time toaccomplish an objective | ..... **Mark(s)** 1.0 |
| **4) Centering and Positioning**<br>❖ Define the center of the laser light for the organ of interest (inward, outward, up, down)<br>❖ Correct patient positioning and orientation<br>❖ Make sure the region of interest in the middle of the FOV<br>❖ No tilt | ..... .3 **Mark(s)** | | |

**The Hashemite University**
**Faculty of Allied Health Sciences**
**Department of Medical Imaging**

# Evaluation Form
# General Radiography

Student's Name:…….. Examination:……
Examiner's name: …… Date:……..

| | | | |
|---|---|---|---|
| **1) Requisition**<br>❖ State the patient's name, sex and age**(0.125)**<br>❖ Identify the procedures to be performed**(0.125)**<br>❖ Note any pathological conditions listed**(0.5)** | **…….Mark(s) 0.75** | **6) Correct equipment selection & use**<br>❖ Select the proper film size and orientation (crosswise, lengthwise) **(0.25)** | **…….Mark(s) 0.25** |
| **2) Patient care & safety**<br>❖ briefly explain the procedure**(0.25)**<br>❖ Check if the patient was properly prepared for the examination (remove metallic objects)**(0.25)**<br>❖ Give proper moving and breathing instructions to the patient**(0.25)**<br>❖ Ask female patients between the ages12-60 years old, if they might possible be pregnant**(0.25)**<br>❖ Make sure the patient is comfortable**(0.25)**.<br>❖ Observing patient during exposure**(0.5)**. | **…….Mark(s) 1.75** | **7) General radiation protection**<br>❖ Use gonadal or ovarian shields where applicable**(0. 5)**<br>❖ Keep the door to radiographic room closed**(0.5)**<br>❖ Ask any persons in the vicinity of the patient to move away before making an exposure. **(0. 25)**<br>❖ Open collimator to desired field size**(0. 5)** | **…….Mark(s) 1.75** |
| **3) Correct selection of technical factors& identification**<br>❖ Correct selection of protocol name, Patient information, technical factors( kvp,mAs if applicable) **(0.25)**<br>❖ Correct use of grid (Table bucky, stand bucky, or no bucky) **(0.25)** | **…….Mark(s) 0.5** | **8) Efficiency use of time & energy**<br>❖ Perform tasks in an efficient order**(0.25)**<br>❖ Use minimum time and physical movement to accomplish an objective**(0.25)**<br>❖ Measure and set technique before positioning**(0.25)** | **…….Mark(s) 0.75** |
| **4) Correct radiographic positioning**<br>❖ Set the correct focal film distance**(0.25)**<br>❖ Place the patient part in proper radiographic position (PA,AP,OBL and Rotation) **(0.5)** | **…….Mark(s) 0.75** | **9) Student evaluation of imaging**<br>❖ Identify all anatomy of interest which must be included on the radiograph**(1.0)**<br>❖ Image evaluation criteria.**(1.0)**<br>❖ Answer any related positioning questions.**(0.5)** | **…….Mark(s) 2.5** |
| **5) Centering**<br>❖ Position "Bucky" or film holder so that CR is centered to film**(0.25)**<br>❖ The body part well centered in proper position **(0.5)**<br>❖ Set the correct tube angle if required. **(0.25)** | **…….Mark(s) 1.0** | | |