



A- COURSE TITLE, CODE, ACADEMIC YEAR:

X-RAY IMAGING EQUIPMENT (RAD 232) 1437-1438H

B- COURSE INFORMATION:

Course Code	Course Title	Credit Units			Study Level	Pre-requisites
		Total	Theory	Practical		
RAD-232	X-ray Imaging Equipment	3	2	1	4 th	RAD-221
Course Coordinator		Extension		Email Address		
Dr. Jumaa Yousif T. Yousif				jtamboul@taibahu.edu.sa		

C- COURSE DESCRIPTION:

The course is designed to establish a knowledge base in radiographic, fluoroscopic, mobile and tomographic equipment requirements and design. The content also provides a basic knowledge of quality control. The course Give a broad overview of the basic elements contained in the course. The course introduces students to the construction and operation of the x-ray machine.

D- COURSE OBJECTIVES:

1. Define potential difference, current, resistance and electrical protective devices.
2. Identify the general components and functions of the tube and filament circuits.
3. Identify the function of solid-state rectification.
4. Compare generators in terms of radiation produced and efficiency.
5. Discuss permanent installation of radiographic equipment in terms of purpose, components, types and applications.
6. Demonstrate operation of various types of permanently installed and mobile radiographic equipment.
7. Discuss mobile units in terms of purpose, components, types and applications.
8. Identify the components of diagnostic x-ray tubes. Explain protocols used to extend x-ray tube life.
9. Explain image-intensified and digital fluoroscopy.
10. Discuss gain and conversion factors as they relate to image intensification.
11. Discuss conventional and digital fluoroscopic image formation.
12. Identify fluoroscopic recording equipment.
13. Indicate the purpose, construction and application of video camera tubes, TV monitors and video recorders.
14. Explain the purpose, principles and application of linear tomography.
15. Explain the rationale for using beam limiting devices.
16. Describe the operation and applications for different types of beam-limiting devices.
17. Summarize the relationship of factors affecting scattered and secondary radiation.
18. Compare grid types.



19. Select the most appropriate grid for a given clinical situation
20. List elements of a quality management program and discuss how each is related to the quality management program.
21. Discuss the proper test equipment/procedures for evaluating the operation of an x-ray generator.

E- THEORY TOPICS:

N. of Week	Theory Topic	Contact Hours
1	X- ray circuit	2
2	Radiographic equipment	4
1	Diagnostic X-ray Tube	2
1	Radiographic couches and support	2
2	Control of scattered Radiation: <ul style="list-style-type: none"> • Collimation devices • Secondary radiation grids 	4
2	Exposure timers and switches	4
2	Image intensified Fluoroscopy	4
1	Linear Tomography	2
1	Advanced X-ray equipments	2
2	Quality assurance and quality control	4

F- PRACTICAL SESSIONS:

N. of Week	Practical Session	Contact Hours
4	orientation and demonstration on x-ray apparatus (Different types: major, mobiles - analog & digital)	8
4	describing equipment components	8
4	describing equipment, operation	8
3	quality control	6

G- ASSESSMENT TASKS:

#	Type of assessment task	Week	Total Grades
1	Assignments (quizzes, seminar homeworks, ect)	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

H- LEARNING RESOURCES:

1- Required textbook:

- Chesney's Equipment for Student Radiographers 4th Edition: By P.H. Carter with A. M. Paterson; M. L. Thornton; A. P. Hyatt; A. Milne and J. R. Pirrie; Blackwell Scientific Publication.
- Essential Physics for Radiographers: By JL Ball & A. D. Moore, Blackwell Scientific Publication.

2- Essential references:

- Bushong S. (2010). Mosby's Radiography Online: Radiologic Physics. 8th ed. St. Louis, Mo: Mosby.

Notes:

- Assignments topics and requirements shall be announced by the end of Week-1, the deadline for submission is 12pm Thursday of Week-10 (each semester).
- Assignments and written assessment tasks must be verified against plagiarism, the maximum acceptable percentage is determined by the department (according to each level).
- Continuous assessments may include quizzes, internet searches, home-works, exercises, class activity, scratch cards, presentations, group work, etc.
- Practical exams may contain hands-on experiments, laboratory work, simulations, or demonstrations.
- Written exams will include multiple-choice questions (MCQ), short essay questions, and long essay questions.