



Course Specification of Radiographic Mathematics

Faculty: Faculty of Medicine and Health Sciences

Department: Health Sciences

Program: Bachelor of Radiologic Technology & Medical Imaging

I. General information about the course instructor :							
Name	Dr. Abdullah Taher	Office Hours (2 Hours Weekly)					
Location & phone number	UST- 715989708	Sat	Sun	Mon	Tue	Wed	Thu
E-mail	A.taher2@ust.edu			√			

II. General information about the course:						
1	Course Title :	Radiographic Mathematics				
2	Course Code and Number :	BMI215				
3	Credit Hours :	Credit Hours				Total
		Theoretical	Seminar/Tutorial	Practical	Training	
		2	-	-	-	2
4	Study Level and Semester:	2 nd level, 1 st semester				
5	Pre-requisites:	None				
6	Co-requisites:	None				
7	Program in which the course is offered:	Bachelor of Radiologic Technology & Medical Imaging				
8	Teaching Language:	English				
9	Instruction location:	University of Science and Technology, Sana'a, Yemen				

III. Course Description :	
<p>This course provides student with the principles of mathematics equations in radiology, radiation physics, medical physics, and radiation therapy, as well as the relevant applications. The course topics will cover and focus on: arithmetical procedures and skills which used in radiology applications such as, basic enumerative equations, fractions computation, percentages, proportionality, first order ordinary linear differential equations with a constant, exponential and decay equations, logarithms, functions graph drawing, radiographic technique charts interpretation, radiograph quality factors calculation, radiographic factors compensation, Magnification factor calculation, Equivalent Exposures equations, trigonometry, and Mathematical skills relevant to radiotherapy. The course carried out using: lectures, self-learning, seminar, applied research, discussion, Brainstorming session, Miniature education, problems solving, and other activities to teach this course materials. The assessment strategies include assignment evaluation and written exams.</p>	

عميد الكلية:
د. عبدالله المخلافي

رئيس القسم:
د. عبدالحبيب القباطي

المراجع:
د. عبده قائد العامري

الموصف:
د. عبدالله ظاهر

IV. Course Aims: This course is aimed to

- 1- Provide the students with basic knowledge of radiographic equations concepts and principles.
- 2- Learn the student to integrate various physical concepts related to medical imaging problems.
- 3- Assist student to investigate the effect of physical parameters on the quality of medical image.
- 4- Enable the student to use mathematical skills in relevant radiography and radiotherapy applications.

V. Course Intended Learning Outcomes (CILOs) :

- 1- State the principles of mathematical functions in radiology applications
- 2- Specify the radiology quality aspects in medical image production using mathematical equations.
- 3- Interpret the role of technical factors, exposure indicators, and software components in medical image production.
- 4- Demonstrate the effectiveness of exposure factors manipulation in radiographic image enhancement.
- 5- Manage with health team members to enhance the radiographic images.
- 6- Assess employed programs in performing and developing radiology systems.



VI. Course Contents				
Theoretical Aspect:				
No.	Course Units	Sub-topics	Week due	Contact Hours
1	Ch. 1 Basic mathematics	<ul style="list-style-type: none"> - Basic enumerative equations, fractions, computation, subtraction, powers. - Percentages, Ratios. - First order ordinary linear differential equations with a constant. 	1 st -3 rd	6
2	Ch. 2: Mathematics skills in radiography	<ul style="list-style-type: none"> - Proportionality - Decay equations, exponential functions. - Logarithms - Standard form. - Similar Traingles. - Pythagoras theorem - Trigonometry. - Inverse square low - Functions graph drawing. 	4 th - 7 th	8
3	Mid Term Exam	Mid Term Exam	8 th	2
4	Ch. 3: Radiographic Mathematics Applications	<ul style="list-style-type: none"> - Radiographic technique charts interpretation. - Radiograph quality factors calculation. - Radiographic factors compensation. - Magnification factor calculation. - Equivalent Exposures equations 	9 th -12 th	8
5	Ch. 4 Mathematics aspects in radiotherapy	<ul style="list-style-type: none"> - Coordinate Systems and Geometrical Issues. - Patient Dose Computation Methods - Distribution and inhomogeneity - Monte Carlo Simulation of Radiation Transport - Dose Fractionation in Radiotherapy. 	13 th - 15 th	6
6	Final exam	Final exam	16 th	2
Total number of weeks and hours			16	32

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المراجع :
د. عبده قائد العامري

الموصف :
د. عبدالله ظاهر