



UNIVERSITI TEKNOLOGI MARA

MIT310: SPECIALISED IMAGING INSTRUMENTATIONS

Course Name (English)	SPECIALISED IMAGING INSTRUMENTATIONS APPROVED
Course Code	MIT310
MQF Credit	2
Course Description	This course will cover radiologic specialized equipment namely mammography, orthopantomography (OPG), dental radiography, Computed Tomography (CT), Magnetic Resonance Imaging (MRI), ultrasound and Positron Emission Tomography-Computed Tomography (PET-CT).
Transferable Skills	Knowledge Communication Skills Social Skills, Teamwork and Responsibilities
Teaching Methodologies	Lectures, Tutorial, Discussion
CLO	<p>CLO1 Describe the principles, components, features and image acquisition of mammography, orthopantomography (OPG), dental radiography, Computed Tomography (CT), Magnetic Resonance Imaging (MRI), ultrasound and Positron Emission Tomography-Computed Tomography (PET-CT).</p> <p>CLO2 Identify the components and features of mammography, orthopantomography (OPG), dental radiography, Computed Tomography (CT), Magnetic Resonance Imaging (MRI), ultrasound and Positron Emission Tomography-Computed Tomography (PET-CT) through presentation.</p> <p>CLO3 Explain the components and features of mammography, orthopantomography (OPG), dental radiography, Computed Tomography (CT), Magnetic Resonance Imaging (MRI), ultrasound and Positron Emission Tomography-Computed Tomography (PET-CT) through group work.</p>
Pre-Requisite Courses	No course recommendations
Topics	
1. Specialized X-ray equipment 1.1) 1.1 Mammographic unit 1.2) 1.1.1 X-ray tube design 1.3) 1.1.2 Compression, scattered radiation and magnification 1.4) 1.5) 1.2 Dental equipment 1.6) 1.2.1 Intraoral 1.7) 1.2.2 Cephalometry 1.8) 1.2.3 Orthopantomography (OPG)	
2. Computed Tomography (CT) 2.1) 2.1 CT Scan generations 2.2) 2.2 Basic principle of CT 2.3) 2.3 Major components of CT 2.4) 2.4 CT Image reconstruction 2.5) 2.5 Helical/spiral CT	
3. Magnetic Resonance Imaging (MRI) 3.1) 3.1 Basic principle of MRI 3.2) 3.2 Basic components of MRI 3.3) 3.3 MRI image acquisition	
4. Ultrasound 4.1) 4.1 Basic principle of ultrasound 4.2) 4.2 Basic components of ultrasound 4.3) 4.3 Ultrasound image acquisition	

5. Positron Emission Tomography - Computed Tomography (PET-CT)

- 5.1) 5.1 Basic principle of PET-CT
- 5.2) 5.2 Basic components of PET-CT
- 5.3) 5.3 PET-CT image acquisition

Assessment Breakdown		%
Continuous Assessment		100.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Assignment 2	10%	CLO2
	Assignment	Assignment 1	20%	CLO3
	Assignment	Assignment 3	20%	CLO3
	Test	Test	50%	CLO1

Reading List	Recommended Text	<ul style="list-style-type: none"> • Carlton, R.R., Adler, A.M. & Balac, V. 2019, <i>Principles of Radiographic Imaging: An Art and A Science</i>, 6th Ed., Cengage Learning USA
	Reference Book Resources	<ul style="list-style-type: none"> • Bushong, S.C 2020, <i>Radiologic Science for Technologists: Physics, Biology and Protection</i>, 12th Ed., Elsevier Mosby USA • Holmes, K., Elkington, M., & Harris, P. 2021, <i>Clark's Essential Physics in Imaging for Radiographers</i>, 2nd Ed., CRC Press USA • Faulkner, W.H. & Seeram, E. 2020, <i>Rad Tech's Guide to MRI: Basic Physics, Instrumentation, and Quality Control</i>, 2nd Ed., Wiley-Blackwell USA • Romans, L.E. 2018, <i>Computed Tomography for Technologists: A Comprehensive Text</i>, 2nd Ed., Lippincott Williams and Wilkins. USA • Williams, S., Taylor, K., & Campbell, S. 2021, <i>Fundamentals of Mammography</i>, 3rd Ed., Elsevier USA • Powsner, R.A., Palmer, M.R. & Powsner, E.R. 2021, <i>Essentials of Nuclear Medicine Physics and Instrumentation</i>, 4th Ed., Wiley-Blackwell USA • Hoskins, P.R., Martin, K., & Thrush, A. 2019, <i>Diagnostic Ultrasound: Physics and Equipment</i>, 3rd Ed., CRC Press USA • Iannucci, J.M. & Howerton, L.J. 2017, <i>Dental Radiography: Principles and Techniques</i>, 5th Ed., Elsevier USA
Article/Paper List		This Course does not have any article/paper resources
Other References		This Course does not have any other resources