



## UNIVERSITI TEKNOLOGI MARA

### MIT311: COMPUTED TOMOGRAPHY TECHNIQUES

<b>Course Name (English)</b>	COMPUTED TOMOGRAPHY TECHNIQUES <b>APPROVED</b>
<b>Course Code</b>	MIT311
<b>MQF Credit</b>	3
<b>Course Description</b>	This course will focus on routine CT scanning protocols and technique for head, chest, abdomen, musculoskeletal and trauma including patient preparation and positioning, data acquisition, image quality and post-processing technique. The application of different techniques and methods as related to various pathologies and clinical situations will also be emphasis.
<b>Transferable Skills</b>	Knowledge Scientific method, critical thinking & problem solving Information management & lifelong learning
<b>Teaching Methodologies</b>	Lectures, Tutorial, Small Group Sessions
<b>CLO</b>	CLO1 Explain scanning protocols, techniques, patient care and image quality of the computed tomography examination. CLO2 Analyse appropriate techniques and protocols in relation to the patient conditions and pathology. CLO3 Demonstrate autonomous learning in an evidence-based manner to appraise the images in the context of common pathologies and artefacts
<b>Pre-Requisite Courses</b>	No course recommendations
<b>Topics</b>	
<b>1. Conventional and multi-slice scanning.</b> 1.1) N/A	
<b>2. Data acquisition and scanning geometry, scanning limitations and pitfalls.</b> 2.1) N/A	
<b>3. Scanning parameters in CT.</b> 3.1) Exposure factors. 3.2) The matrix. 3.3) Field of view (FOV). 3.4) Slice thickness. 3.5) Pitch. 3.6) Window levels (WL). 3.7) Window width (WD).	
<b>4. Contrast media (CM) for CT scanning</b> 4.1) Introduction of CM. 4.2) Patient preparation and positioning. 4.3) Administration of CM. 4.4) Patient care following introduction of CM, effects and remedial actions.	
<b>5. Factors affecting image quality and artefacts in CT.</b> 5.1) N/A	
<b>6. CT Dose Index (CTDI), Dose Length Product (DLP) and radiation dose issues.</b> 6.1) N/A	

<b>7. Scanning protocols:</b> 7.1) Indications, scanning protocols, image acquisition parameters, image reconstruction and post-processing technique for: 7.2) CT Head. 7.3) CT Thorax 7.4) CT Abdomen 7.5) CT Trauma and Musculoskeletal
<b>8. Image quality criteria.</b> 8.1) n/a

Assessment Breakdown		%
Continuous Assessment		100.00%

  

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Students need to analyse critically and scientifically the appropriate CT techniques and protocols by producing an essay of 600 words.	20%	CLO2
	Final Test	Includes CT scan procedures which requires students to enhance knowledge to emphasise the attribute of 'knowledge' in MOHE 1 LOD	40%	CLO1
	Presentation	A presentation on appraise the images in the context of common pathologies and artefacts	20%	CLO3
	Test	Test on CT scanning protocols, techniques, patient care and image quality which require students to enhance knowledge and to emphasize the attribute of 'knowledge' in MOHE 1 LOD.	20%	CLO1

  

Reading List	Recommended Text	<ul style="list-style-type: none"> <li>Seeram E. 2023, <i>Computed tomography: Physical principles, clinical application and quality control</i>, 5th Ed. Ed., Elsevier</li> <li>Hsieh. J, 2022, <i>Computed Tomography: Principles, Design, Artifacts, and Recent Advances.</i>, SPIE</li> </ul>
	Reference Book Resources	<ul style="list-style-type: none"> <li>Carter, D. 2017, <i>Computed Tomography: Advances in Research &amp; Applications (Medical Procedures Testing Tec)</i>, 1st Ed., Nova Science Publisher Inc.</li> <li>Hayre, C. M., &amp; Chau, S. 2022, <i>Computed Tomography: A practical guide</i> (, 1st Ed., CRC Press</li> <li>Romans, L. E. 2018, <i>Computed tomography for technologists: A comprehensive text</i>, 2nd Ed. Ed., Wolters Kluwer</li> <li>Saba, L., &amp; Suri, J. S. 2017, <i>Multi-detector Ct imaging: Abdomen, pelvis, and Cad applications</i>, 1st Ed. Ed., CRC Press.</li> </ul>
Article/Paper List		This Course does not have any article/paper resources
Other References		This Course does not have any other resources