

# PHYSICS MODULE HANDBOOK - 2023

Module Name	RADIOLOGICAL PHYSICS AND DOSIMETRY
Modul Level	Undergraduate
Code	18H02134702
Courses (if applicable)	Medical Physics
Semester	5 <sup>rd</sup>
Person responsible for the module	Dr. Sri Dewi Astuty, S.Si., M.Si .
Lecturer	Prof. Dr Bualkar Abdullah M. Eng Dr. Sri Dewi Astuty, S.Si., M.Si .
Language	Bahasa Indonesia and English
Relation to Curriculum	Undergraduate degree program, mandatory, 5 <sup>rd</sup> semester
Type of Teaching, Contact Hours	<b>Teaching methods:</b> [group discussion], [ <del>simulation</del> ], [case study], [collaborative learning], [ <del>project-based learning</del> ], [problem-based learning]. <b>Teaching forms:</b> [lecture], [ <del>tutorial</del> ], [seminar], [ <del>practicum</del> ], [ <del>research</del> ], [ <del>internship</del> ], [ <del>community service</del> ] <b>Schedule:</b> Wednesday, 13.10 – 15.50
Workload	For this course, students are required to meet a minimum of 90.75 hours in one semester, which consist of: - 26.67 hours for lecture, - 32.00 hours for structured assignments, - 32.00 hours for private study.
Credit Points	2 Credit Points (equivalent with 5.1 ECTS)
Requirements According to the Examination Regulations	A student must have attended at least 80% of the lectures to sit on the final examination.
Mandatory Prerequisites	-
Module objectives/intended learning outcomes	After completing the course, Students are able: <b>Intended Learning Outcomes (ILO):</b> ILO 1: Students have relatively deep understood in classical and basic quantum physics. ILO 4 : Students have capability to operate the physical instrumentation in the laboratory and conduct experiments and interpret the result. <b>Course Learning Objective (CLO):</b>

# PHYSICS MODULE HANDBOOK - 2023

	<p>analyzing dose calculation principles for all radiological equipment, and be able to apply physics-based problem-solving in the utilization of radiological devices and radiation protection.</p> <p><b>Sub CLO</b></p> <p>ILO 1 ⇒ CLO 1: Mastering the scope of radiological studies, fundamentals of radiation physics, radioactivity, nuclear transformations, and radiation sources in the field of radiology.</p> <p>ILO 1 ⇒ CLO 1: Mastering the principles of radiation detectors, calibration of radiation measurement instruments, basic measurements in radiology equipment calibration, and the performance of radiology equipment.</p> <p>ILO 4 ⇒ CLO 1: Applying mathematical models and analyzing radiation dosimetry, radiation measurement instrument reading techniques.</p> <p>ILO 4 ⇒ CLO 1: Capable of describing radiological studies and case studies in surgery journals through scientific papers related to the management of radiodiagnostic examinations, radiotherapy, and nuclear medicine.</p>
<p>Content</p>	<p>Students will learn about:</p> <ol style="list-style-type: none"> <li>1. Radiation Sources and Dosimetry</li> <li>2. Types of Radiation Detectors and Calibration Techniques</li> <li>3. Calibration Management for X-ray Machines, Radiotherapy Devices, and Nuclear Medicine</li> </ol>
<p><b>Forms of Assessment</b></p>	<p>Assessment techniques: [<del>observation</del>], [<del>participation</del>], [<del>performance</del>], [<del>written test</del>], [<del>oral test</del>]</p> <p>Assessment forms: [quiz], [mid-term exam], [<del>final term exam</del>], [assignment], [<del>report</del>], [presentation]</p> <p>The number of Assesment and Evaluation: Assignment 1, 2, 3; Evaluation (Mid-Term and Quiz); Presentation and discuss</p> <p>Quiz = 20%, Mid-term exam = 30%, Assignment = 25%, Presentation = 25%.</p> <p>CO 1 =&gt; ILO 1: 7,5% (Assignment 1: case study) CO 2 =&gt; ILO 4: 7,5% (Assignment 2: problem set analysis)</p>

# PHYSICS MODULE HANDBOOK - 2023

	<p>CO 5 =&gt; ILO 4: 10% (Quiz: problem set analysis)</p> <p>CO 6 =&gt; ILO 4: 10% (Assignment 3: problem set analysis)</p> <p>CO 7 =&gt; ILO 1: 25% (Presentation: case study)</p>
<p><b>Study and examination requirements and forms of examination</b></p>	<p><b>Study and examination requirements:</b></p> <ul style="list-style-type: none"> <li>- Students must attend 15 minutes before the class starts.</li> <li>- Students must switch off all electronic devices.</li> <li>- Students must inform the lecturer if they will not attend the class due to sickness, etc.</li> <li>- Students must submit all class assignments before the deadline.</li> <li>- Students must attend the exam to get final grade.</li> </ul> <p><b>Form of examination:</b> Written exam: Essay</p>
<p><b>Media Employed</b></p>	<p>Text book, Video and Power Point Presentation.</p>
<p><b>Reading List</b></p>	<ol style="list-style-type: none"> <li>1. Cember H and Johnson TE, Introduction to Health Physics, Fourth Edition, Medical, McGraw Hill, 2009.</li> <li>2. Tsoulfanidis N and Landsberger S, Measurement and Detection of Radiation, Fourth Edition, Taylor &amp; Francis Publ. 2015.</li> </ol>