Module Description

Module Name	Nuclear Medicine
Modul Level	Undergraduate
Code	**23H02134502**
Courses (if applicable)	Mandatory Courses
Semester	5rd
Person responsible for the module	Prof. Dr. Sri Suryani, D.E.A.
Lecturer	Prof. Dr. Wira Bahari Nurdin Prof. Dr. Sri Suryani, D.E.A.
Language	Indonesian Language [Bahasa Indonesia]
Relation to Curriculum	Undergraduate degree program, mandatory, 5rd semester
Type of Teaching, Contact Hours	**Teaching methods**: [group discussion], [case study], [collaborative learning]. **Teaching forms**: [lecture] **Schedule**: Monday, 09.10 − 11.50
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: **Intended Learning Outcomes (ILO):** ILO 1: Students have a relatively deep understanding 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. **Course Learning Objective (CLO):** After taking this course, students are expected to master the material on the history of nuclear medicine, get to know the tools and instrumentation of nuclear medicine: conventional X-rays, CT scans, MRI, fluoroscopy, mammography, Linac, and the mechanism of radionuclide production, radiation detectors, and image formation mechanisms. They will understand image interpretation and dose measurement through imaging, utilize

	Sub CLO ILO 1 ⇒ CLO 1 : Understanding the history of nuclear medicine ILO 1 ⇒ CLO 2 : Getting acquainted with nuclear medicine tools and instrumentation ILO 1 ⇒ CLO 3: Understanding radionuclide production mechanisms ILO 1 ⇒ CLO 4 : Understanding the operation of radiation detectors and image formation mechanisms ILO 4 ⇒ CLO 5 : Performing image interpretation and dose measurement through imaging ILO 4 ⇒ CLO 6 : Explaining the utilization of radiation sources in nuclear medicine
Content	Students will learn about: 1. Radionuclide formation 2. Radiopharmaceuticals and nuclear medicine 3. Imaging in nuclear medicine
Forms of Assessment	Assessment techniques: [participation], [written test]. Assessment forms: [quiz], [mid-term exam], [assignment], [presentation] The number of Assessment and Evaluation: Assignment 1, 2, 3; Evaluation (Mid-Term and Quiz); Presentation and discuss Quiz = 20%, Mid-term exam = 30%, Assignment = 25%, Presentation = 25%. CO 1 => ILO 1: 7,5% (Assignment 1: case study) CO 2 => ILO 4: 7,5% (Assignment 2: problem set analysis) CO 3 => ILO 4: 10% (Quiz: problem set analysis) CO 4 => ILO 1: 30% (Mid-Term: written test) CO 5 => ILO 4: 10% (Quiz: problem set analysis) CO 6 => ILO 4: 10% (Assignment 3: problem set analysis) CO 7 => ILO 1: 25% (Presentation: case study)
Study and examination requirements and forms of examination	**Study and examination requirements:** - Students must attend 15 minutes before the class starts. - Students must switch off all electronic devices. - Students must inform the lecturer if they will not attend the class due to sickness, etc. - Students must submit all class assignments before the deadline. - Students must attend the exam to get a final grade.

	Form of examination: ● Written exam: Essay
Media Employed	Text book, Video and PowerPoint Presentation.
Reading List	1. 1. Bushberg Jerold, The Essential Physics of Medical Imaging, 2th Ed, New York Lippincott, William & Wilkins, New York, 2001 2. Curry TJ, Dowdey JE, Murry RC, Crestensen's Physics of Diagnostic Radiology, 4 th ed, Philadelphia London, Lea & Febiger, 1990 3. Meredith, Massey,JB, Fundamental Physics of Radiology. Springfield: Charles C.Thomas Pub,1987 4. Nurdin, Wira Bahari, 2013, Fisika Nuklir untuk Kedokteran Medik IPB Press.