UIN SUNAN KALIJAGA YOGYAKARTA
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Undergraduate Programme in Physics

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MODULE HANDBOOK

Module Name	Physics of Radiology
Module level, if applicable	Bachelor
Code, if applicable	FIS424046
Subtitle, if applicable	-
Courses, if applicable	-
Semester(s) in which the module is taught	6th (Sixth)
Person responsible for the module	Dr. Nita Handayani, M.Si
Lecturer(s)	Dr. Nita Handayani, M.Si
Language	Indonesia
Relation to curriculum	compulsory course in the third year (6th semester) Bachelor Degree
Type of teaching, contact hours	150 minutes lectures, and 180 minutes structured activities per week.
Workload	Total workload is 136 hours per semester, which consists of 150 minutes lectures per week for 14 weeks, 180 minutes structured activities per week, 180 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam
Credit points	3
Requirements according to the examination regulations	Minimum attendance 75% All assignments submitted Attendance on time
Recommended prerequisites	No prerequisites stated on
Module objectives/intended learning outcomes	After completing this course, the students: CO 1. Able to explain basic concepts related to radiation and explain the working principles of machines that produce high radiation energy. CO 2. Able to explain the various interactions that occur between ionizing radiation, photons, charged particles, single beams of X-rays and gamma rays and matter CO 3. Able to explain the use of radiation in medical equipment in diagnostic radiology and nuclear medicine units. CO 4. Able to apply the principles of dosimetry and radiation protection in the field of radiology.
Content	1. Basic Concepts of Radiation 2. Basic Consepts of Nuclear Physics 3. Production and Properties of X-Rays 4. Quality and Spectral Distribution of X-Rays 5. High Energy Machines: Linac, Betatron, Cyclotron, Cobalt-60 Unit 6. Interaction of Ionizing Radiation with Matter

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	7. Basic Interactions Between Photons and Charged Particles with Matter 8. Interaction between a single beam of X-rays and gamma rays with a scattering medium 9. Radiation Protection 10. Diagnostic Radiology 11. Effects of Radiation on Living Creatures (Radiobiology)
Study and examination requirements and forms of examination	The final mark will be weighted as follows:

NO	Assessment methods (components, activities)	Weight (percentage)
1	Final Examination	30%
2	Mid-Term Examination	30%
3	Class Activities : Quiz, Homework, etc.	20%
4	Project Based Learning (PBL)	20%

The final assessment is expressed in the form of a letter value converted from a number value with the following categories:

NO	Number Value	Letter Value	NO	Number Value	Letter Value
1	≥ 95	A	7	65-69.99	B/C
2	90-94.99	A-	8	60-64.99	C+
3	85-89.99	A/B	9	55-59.99	C
4	80-84.99	B+	10	50-54.99	C-
5	75-79.99	B	11	55-34.99	D
6	70-74.99	B-	12	<35	E

Media employed	White-board, LCD Projector, e-learning (https://daring.uin-suka.ac.id/)
Reading list	1. Harold Elford Johns, John Robert Cunningham, *Physics of Radiology*, Fourth Edition, Charles C Thomas Publisher, 1983 2. D.R. Dance, S Christofides, A.D.A. Maidment, I.D. McLean, K.H. Ng, *Diagnostic Radiology Physics: A Handbook for Teachers and Students*, International Atomic Energy Agency, Vienna, 2014 3. Podgorsak, *Radiation Physics for Medical Physicists*, 2nd Edition, Springer Verlag, 2010 4. A. Kaul, J.H. Bernhardt, H.M. Kramer, *Fundamentals and Data in Radiobiology, Radiation Biophysics, Dosimetry and Medical Radiological Protection,* Springer-Verlag Berlin Heidelberg, 2012

PLO and CO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9
CO 1		√							
CO 2				√					
CO 3					√				
CO 4							√		