



MINISTRY OF EDUCATION AND CULTURE
UNIVERSITAS NEGERI SURABAYA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF PHYSICS

Ketintang Campus, Jalan Ketintang, C3 Building, Surabaya 60231
 Website: <https://pendidikan-fisika.fmipa.unesa.ac.id/>, email: s1-pfis@unesa.ac.id

Undergraduate Programme of Physics Education

Module Handbook

Module Name :	<i>Fisika Inti</i> Nuclear Physics
Module level :	Bachelor degree/Undergraduate Programme
Course Code :	8420304068
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not Applicable
Semester/Term	7/Fourth Year
Module coordinator(s)	Prof. Dr. Wasis, M.Si
Lecturer(s):	Tjipto Prastowo, Ph.D. Mita Anggaryani, M.Pd.
Language:	<i>Bahasa Indonesia</i>
Classification within the curriculum:	Compulsory/ Elective
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or sks*)
Workload :	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 135 total hours per semester ~ 4.77 ECTS**
Credit Point:	3 sks (4.77 ECTS)
Requirements:	Quantum Physics Statistical Physics
Learning goals/competencies:	<ol style="list-style-type: none"> 1. Demonstrating independent, creative and honest characters in doing student assignments, mid and final exams. 2. Understanding structured concepts of the nucleus of an atom in many aspects from the history of nuclear discovery to possible 3. applications of nuclear technology and energy, and its corresponding nuclear waste management. 4. Understanding different perspectives of a nuclear power plant and the search for alternative energy based on nuclear reaction. 5. Understanding poster creation with relevant themes of radioisotope decay for various applications in human life.
Content	Nuclear Physics examines the discovery of the nucleus of an atom, nuclear properties in general, nuclear stability and binding energy per nucleon, deuteron as the simplest nucleus, energy levels of nucleus, nuclear models, radioactive decay, mechanisms of nuclear decay, Q-value calculation for nuclear reaction, building blocks of matter, families of elementary particles, fundamental conservation laws in nuclear reaction, the existence



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	of meson, nuclear fission and fusion, alternative green energy based on hydrogen fusion, nuclear technology, a nuclear power plant and its corresponding nuclear waste management, and radioactive decay for various applications in human life.										
Attribute Soft skill:	Scientific report, public speaking, and team work										
Study/exam achievements:	<p>Students are considered to complete the course and pass if they obtain at least 40% of maximum final grade. The final grade (NA) is calculated based on the following ratio:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Assessment Components</th> <th style="text-align: left;">Percentage of contribution</th> </tr> </thead> <tbody> <tr> <td>Participation</td> <td style="text-align: center;">20%</td> </tr> <tr> <td>Assignment</td> <td style="text-align: center;">30%</td> </tr> <tr> <td>Mid-semester test</td> <td style="text-align: center;">20%</td> </tr> <tr> <td>Final semester test</td> <td style="text-align: center;">30%</td> </tr> </tbody> </table>	Assessment Components	Percentage of contribution	Participation	20%	Assignment	30%	Mid-semester test	20%	Final semester test	30%
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Learning Methods :	Student-centered approach, lecture and discussion, and presentations (structured activities)										
Form of Media:	<i>Power Point</i> slides, e-book file, and multimedia.										
Literature (primary references):	<ol style="list-style-type: none"> 1. Prastowo, T. 2015. Lecture Notes on Nuclear Physics. Unpublished work. 2. Abdullah, K. M. S. 2014. Fundamentals of Nuclear Physics. Kurdistan Region, Iraq: University of Duhok Publication. 3. Bortz, A. B. 2007. Physics: decade by decade. New York, US: Facts on File Inc. 4. Serway, R. A., Moses, C. J., and Moyer, C. A. 2005. Modern Physics. Belmont, US: Thomson Brooks/Cole. 5. Beiser, A. 2003. Concepts of Modern Physics. New York, US: McGraw-Hill Companies 6. Some power point files and/or course materials relevant to Nuclear Physics from the internet 										
Notes:	<p>*1 sks in learning process = three periods consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</p> <p>**1 sks = 1,59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/Un38/Hk/Ak/2019</p>										