MINISTRY OF EDUCATION, CULTURE, RESEARCH, AND TECHNOLOGY
UNIVERSITAS NEGERI SURABAYA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
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Master Program of Science Education **Module Handbook**

Module Name :	*Kajian Sains Fisika IV/* *Study of Physical Science IV*)*
Module level :	*Master Program of Science Education*
Course Code :	*8410103082*
Abbreviation, if applicable:	*-*
Courses included in the module, if applicable:	*Not Applicable*
Semester/Term	*2nd /First Year*
Module coordinator(s)	*Prof. Tjipto Prastowo, Ph.D.*
Lecturer(s):	*Prof. Tjipto Prastowo, Ph.D.*
Language:	*Indonesian Language*
Classification within the curriculum:	*Compulsory/ ~~Elective~~*
Teaching format/class hours per week during the semester:	*3 contact hours of lectures (Indonesia credit semester or CU*)*
Workload :	*3 x 50 minutes lectures, 3 x 90 minutes structured activity,* *3x 100 minutes individual activity, 14 weeks per semester,* *168 total hours per semester ~ 6.72 ECTS***
Credit Point:	*3 CU (6.72 ECTS)*
Requirements:	
Learning goals/competencies:	**Knowledge (KNO-2)** **CLO-1** *Mastering knowledge and technology a structured study of the concept of atomic nuclei in various aspects from the history of core discovery to opportunities for the application of nuclear technology and energy knowledge, and relevant nuclear waste management with the field of physics education and learning in schools.* *CLO-2* *Mastering knowledge and technology the latest core physics education and learning problems by developing more effective and contextual learning strategies through a multidisciplinary approach in designing physics learning media the core is a poster of the application of core physics in various areas of life.* **Comptency(COM-3)** *CLO-3* *Designing and creating with solving physics education and learning problems related to core physics teaching materials in more complex schools through activities and learning experiences with the use of relevant learning tools and/or virtual laboratories.*

<table>
<tr><td>Content</td><td>This course examines learn about the history of the discovery and physics concepts of the core, the nature and behavior of atomic nuclei, the stability of the nucleus and the binding energy of the nucleus, detron as the simplest nucleus, the energy levels of the nucleus, various core models, the radioactivity of the core, the decay mechanism of the radioactive nucleus, the calculation of Q-value for different types and conditions of core reactions, building blocks of matter, the 'family' of elementary particles, the principle of fundamental immutability in the world of elementary particles, birth of mesons, fission reactions and fusion reactions, alternative energy sources based on fusion reactions, nuclear technology and nuclear waste management, and radioisotope applications in various areas of life.</td></tr>
<tr><td>Attribute Soft skill:</td><td>Scientific report, public speaking, and team work</td></tr>
<tr><td>Study/exam achievements:</td><td>Students are considered to be competent and pass if at least get 70. Final score is calculated as follows: 20% Participation + 30% Assignment + 20% Middle Exam (UTS) + 30% Final Exam (UAS)
Final index is defined as follow:
<table>
<tr><th>Index</th><th>Converted Score</th><th>Score Range</th></tr>
<tr><td>A</td><td>4.00</td><td>85 ≤ A ≤ 100</td></tr>
<tr><td>A-</td><td>3.75</td><td>80 ≤ A- < 85</td></tr>
<tr><td>B+</td><td>3.50</td><td>75 ≤ B+ < 80</td></tr>
<tr><td>B</td><td>3.00</td><td>70 ≤ B < 75</td></tr>
<tr><td>B-</td><td>2.75</td><td>65 ≤ B- < 70</td></tr>
<tr><td>C+</td><td>2.50</td><td>60 ≤ C+ < 65</td></tr>
<tr><td>C</td><td>2.00</td><td>55 ≤ C < 60</td></tr>
<tr><td>D</td><td>1.00</td><td>40 ≤ D < 55</td></tr>
<tr><td>E</td><td>0.00</td><td>0 ≤ E < 40</td></tr>
</table></td></tr>
<tr><td>Learning Methods :</td><td>Case Method and Discussion</td></tr>
<tr><td>Form of Media:</td><td>Power Point slides, e-book file, and multimedia.</td></tr>
<tr><td>Literature (primary references):</td><td>1. Ghoshal, S. N. 2002. Nuclear Physics (for undergraduate and postgraduate Student of Indian Universities). Ram Nagar, New Delhi: S. Chand & Company LTD .
2. Subrahmanyam, N. Lal, Brij. Seshan. J. 2005. Atomic and Nuclear Physics . Ram Nagar, New Delhi: S. Chand & Co. Ltd
3. Prastowo, T. 2015. Lecture Notes on Nuclear Physics. Unpublished work.
4. Abdullah, K. M. S. 2014. Fundamentals of Nuclear Physics. Kurdistan Region, Iraq: University of Duhok Publication.
5. Serway, R. A., Moses, C. J., and Moyer, C. A. 2005. Modern Physics. Belmont, US: Thomson Brooks/Cole.</td></tr>
<tr><td>Notes:</td><td>*1 CU in learning process = three periods consist of: (a) scheduled instruction in a classroom (50 minutes); (b) structured activity (90 minutes); and (c) individual activity (100 minutes) according to according to Rector Decree of Universitas</td></tr>
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	Negeri Surabaya No. 598/UN38/HK/AK/2020
	***1 CU = 2.24 ECTS according to Rector Decree of Universitas Negeri Surabaya No. 598/UN38/HK/AK/2020*
	Total ECTS = (total hours workload/ 60 min) / 25 hours* **Each ECTS is equals with 25 hours
Last Amendment	*5 January 2023*