MINISTRY OF EDUCATION, CULTURE, RESEARCH, AND TECHNOLOGY
UNIVERSITAS NEGERI SURABAYA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
Ketintang Campus, D-1 Building, Surabaya 60231 +6231-8296427
Website: www.fmipa.unesa.ac.id, email: info_fmipa@unesa.ac.id

Master Program of Science Education **Module Handbook**

Module Name :	*Kajian Sains Fisika III/* *Study of Physical Science III*)*
Module level :	*Master Program of Science Education*
Course Code :	84101030803
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	*Not Applicable*
Semester/Term	*1st /Second Year*
Module coordinator(s)	*Dr. Eko Hariyono, M.Pd*
Lecturer(s):	*Dr. Eko Hariyono, M.Pd*
Language:	*Indonesian Language*
Classification within the curriculum:	*Compulsory/ ~~Elective~~*
Teaching format/class hours per week during the semester:	*2 contact hours of lectures (Indonesia credit semester or CU*)*
Workload :	*2 x 50 minutes lectures, 2 x 90 minutes structured activity, 2 x 100 minutes individual activity, 14 weeks per semester, 112 total hours per semester ~ 4.48 ECTS***
Credit Point:	*2 CU (4.48 ECTS)*
Requirements:	
Learning goals/competencies:	**Knowledge (KNO-2)** *CLO-1* *Mastering knowledge and technology a comprehensive structured study of electomagnetic fields and electromagnetic wave propagation relevant to the field of physics education and learning* *CLO-2* *Mastering knowledge and technology in education and learning physics of electromagnetic field theory and electromagnetic collision by developing effective and contextual learning strategies through the latest learning media* **Competency (COM-3)** *CLO-3* *Designing and creating working groups tasked with solving physics education and learning problems related to quantum physics teaching materials in more complex schools through learning activities by utilizing the latest and relevant learning resources*

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<table>
<tr><td>Content</td><td>This course examines postulates, principles and concepts of quantum mechanics, eigenvalues and functions with discrete spectrum, schrodinger motion equations, angular momentum, and their application to quantum problems of hydrogen atoms and multi-electron atoms</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) Brown, Gary E. (2008). Esential quantum mechanic. New York: Oxfird university press.
2) Merzbacher, Eugene (1970) Quantum mechanics. Singapore: Wiley International Edition.
3) Nave, Rode (2004) Hyperphysics interactive software. Georgia: Georgia State University.</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 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</td></tr>
<tr><td>Last Amendment</td><td>5 January 2023</td></tr>
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