



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 Modern</i> Modern Physics
Module level :	Bachelor degree/Undergraduate Programme
Course Code :	8420303076
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not Applicable
Semester/Term	4/Second Year
Module coordinator(s)	Dra. Suliyannah, M.Si
Lecturer(s):	Dra. Suliyannah, M.Si Tjipto Prastowo, Ph. Asnawi, M.Si Lydia Rohmawati, M.Si
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:	Basic Physics I
Learning goals/competencies:	<ol style="list-style-type: none">1. Students can master and demonstrate knowledges about relativity theories and are able to communicate scientifically and work effectively both individually and in groups2. Students can master and demonstrate knowledges about the particles properties of wave and are able to communicate scientifically and work effectively both individually and in groups3. Students can master and demonstrate knowledges about the wave properties of particles and are able to communicate scientifically and work effectively both individually and in groups4. Students can master and demonstrate knowledges about atom structures and are able to communicate scientifically and work effectively both individually and in groups5. Students can master and demonstrate knowledges about quantum mechanics and are able to communicate scientifically and work effectively both individually and in groups



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	<ol style="list-style-type: none"> 6. Students can master and demonstrate knowledges about quantum theory of hydrogen atom and are able to communicate scientifically and work effectively both individually and in groups 7. Students can master and demonstrate knowledges about atom with many electrons and are able to communicate scientifically and work effectively both individually and in groups 8. Students can master and demonstrate knowledges about nucleus structures and are able to communicate scientifically and work effectively both individually and in groups 9. Students can master and demonstrate knowledges about nucleus transformations and are able to communicate scientifically and work effectively both individually and in groups 10. Students can master and demonstrate knowledges about elementary particles and are able to communicate scientifically and work effectively both individually and in groups 										
Content	<p>Modern physics course discuss about concepts/ principles/ theories/ basic laws Modern Physics (physics content knowledge) which is base of studied material on physics curriculum of Senior high school (SMA/SMK) deeply that include Relativity, Particles Properties of Wave, Wave Properties of Particles, Atomic Structures, Quantum Mechanics, Quantum Theories of Hydrogen Atom, Atom with Many Electrons, Nucleus Structures, Nucleus Transformations, Elementary Particles, and are able to communicate scientifically and work effectively both individually and in groups</p>										
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: right;">Percentage of contribution</th> </tr> </thead> <tbody> <tr> <td>Participation</td> <td style="text-align: right;">20%</td> </tr> <tr> <td>Assignment</td> <td style="text-align: right;">30%</td> </tr> <tr> <td>Mid-semester test</td> <td style="text-align: right;">20%</td> </tr> <tr> <td>Final semester test</td> <td style="text-align: right;">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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Mid-semester test	20%										
Final semester test	30%										
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. Beiser A, 2003, "Consepts of Modern Physics", Sixth Edition. McGraw Hill Inter. BookCompany 										



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	<ol style="list-style-type: none">2. Supangkat, Haryadi, 1990. "Fisika Modern", Jurusan Fisika ITB.3. Wehr, M R. 1980, " Physics of The Atom" , Addison Wesley Manila
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>