UIN SUNAN KALIJAGA YOGYAKARTA
FACULTY OF SCIENCE AND TECHNOLOGY
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Undergraduate Programme in Physics

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MODULE HANDBOOK

Module Name	Modern Physics
Module level, if applicable	Bachelor
Code, if applicable	FIS414012
Subtitle, if applicable	-
Courses, if applicable	Modern Physics
Semester(s) in which the module is taught	3rd (Third)
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 second year (3rd semester) Bachelor Degree
Type of teaching, contact hours	150 minutes lectures, 170 minutes practicum and 180 minutes structured activities per week.
Workload	Total workload is 181,3 hours per semester, which consists of 150 minutes lectures per week for 14 weeks, 170 minutes practicum per week, 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	4
Requirements according to the examination regulations	Minimal attendance 75% All assignments are submitted Come to class on time
Recommended prerequisites	Mathematical Physics 1 Elementary Physics 2
Module objectives/intended learning outcomes	After completing this course, the students: CO 1. Able to explain the theories and experimental results which became the basis for the birth of modern physics studies and the theory of relativity CO 2. Able to apply modern physics concepts logically, critically and systematically to analyze physics problems in everyday life. CO 3. Able to apply mathematical methods to solve modern physics problems CO 4. Able to design and carry out experiments to prove theories in the study of modern physics properly and correctly.
Content	Special relativity: Einstein postulates in special relativity and their implications, Four-Vectors, Four-Vector Scalar Products, Proper Time, Proper Velocity, The Energy-Momentum 4-Vector, Relativistic Kinematics, and Relativistic Electrodynamics, basic of General relativity. Quantum physics: thermal radiation and Planck's postulate, particle like properties of radiation, wavelike properties of particles, models of atom, Schrodinger's theory of quantum mechanics, solution of time-independent Schrodinger equation, nuclear structure, radioactivity and nuclear reaction.

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<table>
<tr><td></td><td></td></tr>
<tr><td>Study and examination requirements and forms of examination</td><td>The final mark will be weighted as follows:
<table>
<tr><th>NO</th><th>Assessment methods (components, activities)</th><th>Weight (percentage)</th></tr>
<tr><td>1</td><td>Final Examination</td><td>25%</td></tr>
<tr><td>2</td><td>Mid-Term Examination</td><td>25%</td></tr>
<tr><td>3</td><td>Class Activities : Quiz, Homework, etc.</td><td>15%</td></tr>
<tr><td>4</td><td>Project Based Learning (PBL)</td><td>10%</td></tr>
<tr><td>5</td><td>Practicum</td><td>25%</td></tr>
</table>

The final assessment is expressed in the form of a letter value converted from a number value with the following categories:
<table>
<tr><th>NO</th><th>Number Value</th><th>Letter Value</th><th>NO</th><th>Number Value</th><th>Letter Value</th></tr>
<tr><td>1</td><td>≥ 95</td><td>A</td><td>7</td><td>65-69.99</td><td>B/C</td></tr>
<tr><td>2</td><td>90-94.99</td><td>A-</td><td>8</td><td>60-64.99</td><td>C+</td></tr>
<tr><td>3</td><td>85-89.99</td><td>A/B</td><td>9</td><td>55-59.99</td><td>C</td></tr>
<tr><td>4</td><td>80-84.99</td><td>B+</td><td>10</td><td>50-54.99</td><td>C-</td></tr>
<tr><td>5</td><td>75-79.99</td><td>B</td><td>11</td><td>55-34.99</td><td>D</td></tr>
<tr><td>6</td><td>70-74.99</td><td>B-</td><td>12</td><td><35</td><td>E</td></tr>
</table></td></tr>
<tr><td>Media employed</td><td>White-board, LCD Projector, e-learning (https://daring.uin-suka.ac.id/)</td></tr>
<tr><td>Reading list</td><td>1. Beiser A., Concept of Modern Physics, 6th Edition, McGraw Hill, 2003
2. Kenneth S. Krane, Modern Physics 3rd Edition, John Wiley & Sons, 2012
3. Paul A. Tipler, Modern Physics, 6th Edition, WH Freeman and Company, 2012</td></tr>
</table>

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									√