UIN SUNAN KALIJAGA YOGYAKARTA
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Undergraduate Programme in Physics

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MODULE HANDBOOK

Module Name	Computational Material
Module level, if applicable	Bachelor
Code, if applicable	FIS424085
Subtitle, if applicable	-
Courses, if applicable	Computational Material (Komputasi Material)
Semester(s) in which the module is taught	6th (sixth)
Person responsible for the module	Dr. Widayanti, M. Si.
Lecturer(s)	Sri Hidayati, M. Sc.
Language	Indonesia
Relation to curriculum	Elective course in the third year (7th semester) Bachelor Degree
Type of teaching, contact hours	150 minutes lectures and 180 minutes structured activities per week.
Workload	Total workload is 136 hours per semester, which consists of 150 minutes lectures per week for 14 weeks, 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	3
Requirements according to the examination regulations	Minimum attendance 75%
Recommended prerequisites	No prerequisites stated on
Module objectives/intended learning outcomes	After completing this course, the students: CO 1. Students can develop physics skills, such as formulating and describing physical phenomena and revealing critical information in the physics problem through various tricks or specific mathematical procedures utilizing multiple approximations. CO 2. Students have analytical skills, namely analysing physics problems in detail and building arguments logically and carefully. CO 3. Students have the ability in investigative skills, namely, how to search for physics problems from various sources and references to gain understanding and essential information. CO 4. Students can develop problem-solving skills, namely, how to solve a problem in a structured manner, formulate a problem carefully, and try other approaches to improve the solution of many challenging issues, especially in material systems. CO 5. Students have the ability in Information & Technology skills, namely how to apply various forms of visualization, graphics, or simulations using computer assistance and software, programming languages , and

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<table>
<tr><td></td><td>appropriate numerical packages or devices to solve problems in material systems.</td></tr>
<tr><td>Content</td><td>a. Basic concept of Quantum Mechanics
b. Electronic structure of condensed matter
c. Electronic structure method: Hartree-Fock method
d. Electronic structure method: Density Functional Theory</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>40%</td></tr>
<tr><td>2</td><td>Mid-Term Examination</td><td>30%</td></tr>
<tr><td>3</td><td>Class Activities : Quiz, Homework, etc.</td><td>30%</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, computer, computational software, e-learning (https://daring.uin-suka.ac.id/)</td></tr>
<tr><td>Reading list</td><td>1. An introduction to computational physics, Tao Pang,
2. Building Applications with the Linux Standard Base, Linux Standart Base Team
3. Computational Materials Science, Wolfram Hergert, Arthur Ernst, Markus Dane</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	PLO 10
CO 1				√					√	
CO 2				√					√	
CO 3				√					√	
CO 4				√					√	
CO 5				√					√	