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	Crystal Physics
Module level, if applicable	Bachelor
Code, if applicable	FIS424057
Subtitle, if applicable	-
Courses, if applicable	Crystal Physics I (Fisika Kristal)
Semester(s) in which the module is taught	5th (fifth)
Person responsible for the module	Dr. Asih Melati, M.Sc
Lecturer(s)	Dr. Asih Melati, M.Sc
Language	Indonesia
Relation to curriculum	Elective course in the third year (5th semester) Bachelor Degree
Type of teaching, contact hours	150 minutes lectures and 120 minutes structured activities per week.
Workload	Total workload is 90.7 hours per semester, which consists of 100 minutes lectures per week for 14 weeks, 120 minutes structured activities per week, 120 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	Create a project of science applications and minimum attendance 75 %
Recommended prerequisites	No prerequisites stated on
Module objectives/intended learning outcomes	After completing this course, the students: CO 1. Mastering the theoretical concepts and main principles of classical physics and modern physics, as well as knowledge of technology based on physics and its application and integrating it with religion CO 2. Mastering mathematical, computational and instrumentation methods to solve physics problems and apply his knowledge to a broader field. CO 3. Able to formulate and analyse scientific studies and research related to physics CO 4. Master the basic principles of experimentation and physics measurement methods to formulate physical phenomena based on observation and data analysis CO 5 Apply logical, critical, systematic, and innovative thinking in the context of developing or implementing science and/or technology in accordance with the field of physics CO 6 Have integrity, responsibility, the ability to work together and be able to communicate ideas orally and in writing [CP6]

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<table>
<tr><td></td><td>CO 7 Able to formulate and analyse scientific studies and research related to physics or broader fields</td></tr>
<tr><td>Content</td><td>a. Crystals and Lattices
b. Crystal Symmetry
c. Crystal Systems and Geometry
d. Group Space and Crystal Equivalent Positions
e. X-ray Diffraction
f. Atomic Position Determination
g. Tensor Properties of Crystals
h. Crystal Dislocations
i. Observation of Defects in Crystals
j. Experimental Methods that Utilise Crystallographic Concepts</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, e-learning (https://daring.uin-suka.ac.id/)</td></tr>
<tr><td>Reading list</td><td>1. "Introduction to Nanoscience and Nanotechnology" by Chris Binns (Publisher: Wiley, 2010)
2. "Nanotechnology: Principles and Practices" by Sulabha K. Kulkarni (Publisher: CRC Press, 2017)
3. "Nanotechnology: Understanding Small Systems" by Ben Rogers, Jesse Adams, and Sumita Pennathur (Publisher: CRC Press, 2016)
4. "Nanomaterials: Synthesis, Properties, and Applications" edited by A.S. Edelstein and R.C. Cammarata (Publisher: CRC Press, 2001)</td></tr>
</table>

	5. "Nanostructures and Nanomaterials: Synthesis, Properties, and Applications" edited by Guozhong Cao (Publisher: World Scientific Publishing Company, 2004 6. "Handbook of Nanoscience, Engineering, and Technology" edited by William A. Goddard III, Donald W. Brenner, Sergey Edward Lyshevski, and Gerald J. Iafrate (Publisher: CRC Press, 2007)

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				√	√	√			√	
				√	√	√			√	