



UNIVERSITAS NEGERI YOGYAKARTA  
FACULTY OF MATHEMATICS AND NATURAL SCIENCES  
DEPARTMENT OF PHYSICS EDUCATION  
**PHYSICS STUDY PROGRAM**

Colombo St. Number 1 Yogyakarta 55281  
Telephone (0274)565411 Ext. 217, fax (0274) 548203  
Web: <http://fisika.fmipa.uny.ac.id/>, E-mail: [fisika@uny.ac.id](mailto:fisika@uny.ac.id)

**Bachelor of Physics**

**MODULE HANDBOOK**

Module name:	Solid State Physics
Module level, if applicable:	Bachelor Program
Code:	FSK6227
Sub-heading, if applicable:	-
Classes, if applicable:	B-E
Semester:	6
Module coordinator:	Prof. Dr. Ariswan, M. Si.
Lecturer(s):	Prof. Dr. Ariswan, M. Si.
Language:	Bahasa Indonesia
Classification within the curriculum:	Elective Course
Teaching format / class hours per week during the semester:	100 minutes lectures and 120 minutes structured activities per week.
Workload:	Total workload is 91 hours per semester which consists of 100 minutes lectures, 120 minutes structured activities, and 120 minutes individual study per week for 16 weeks.
Credit points:	2 SKS (3.25 ECTS)
Prerequisites course(s):	
Course Outcomes	At the end of this course students should be able to: <ol style="list-style-type: none"><li>1. Explain the basic concepts used to describe crystal structures and their physical properties</li><li>2. Analyze the application of solid-state physics concepts to physical phenomena</li></ol>
Content:	The course aims to introduce students to the main concepts of modern Solid State Physics. It will cover the fundamentals,

	<p>from crystal structures and diffraction till the nature of the energy bands.</p> <ul style="list-style-type: none"> <li>• Introduction (Chapter 1 Kittel)</li> <li>• Crystal structures; Fundamental types of lattices, Simple crystal structures.</li> <li>• Diffraction of waves by crystals (Chapter 2 Kittel)</li> <li>• Reciprocal space and determination of lattice structures (Chapter 2 Kittel))</li> <li>• Phonons and thermal properties of Crystals (Chapter 4 and 5 Kittel)</li> <li>• Free Electron Fermi Gas Model (Chapter 6 Kittel)</li> <li>• Energy bands (Chapter 7 Kittel)</li> </ul>																																
Study / exam achievements:	<p>Course evaluation will be carried out through (1) weekly assignments, (2) midterm exam (written), and (3) final exam (written). Determination of final grade is as follows:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;">Final score = 35% assignments + 35% midterm exam + 30% final exam</p> </div> <p>The final score then converted into the grade as follows:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Final score</th> <th colspan="2">Conversion</th> </tr> <tr> <th>Grade</th> <th>Points</th> </tr> </thead> <tbody> <tr><td>86 – 100</td><td>A</td><td>4.00</td></tr> <tr><td>81 – 85</td><td>A-</td><td>3.67</td></tr> <tr><td>76 – 80</td><td>B+</td><td>3.33</td></tr> <tr><td>71 – 75</td><td>B</td><td>3.00</td></tr> <tr><td>66 – 70</td><td>B-</td><td>2.67</td></tr> <tr><td>61 – 65</td><td>C+</td><td>3.33</td></tr> <tr><td>56 – 60</td><td>C</td><td>2.00</td></tr> <tr><td>41 – 55</td><td>D</td><td>1.00</td></tr> <tr><td>0 – 40</td><td>E</td><td>0.00</td></tr> </tbody> </table> <p>For passing this course, students must obtain grade D or higher.</p>	Final score	Conversion		Grade	Points	86 – 100	A	4.00	81 – 85	A-	3.67	76 – 80	B+	3.33	71 – 75	B	3.00	66 – 70	B-	2.67	61 – 65	C+	3.33	56 – 60	C	2.00	41 – 55	D	1.00	0 – 40	E	0.00
Final score	Conversion																																
	Grade	Points																															
86 – 100	A	4.00																															
81 – 85	A-	3.67																															
76 – 80	B+	3.33																															
71 – 75	B	3.00																															
66 – 70	B-	2.67																															
61 – 65	C+	3.33																															
56 – 60	C	2.00																															
41 – 55	D	1.00																															
0 – 40	E	0.00																															
Forms of media:	Board and LCD Projector																																
Literature:	1. Kittel, Introduction to Solid State Physics, Eighth Edition, John Wiley and Sons, Inc., 8th edition																																

### PLO and CO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
CO1		✓						
CO2					✓			