FI561 Solid State Physics

Module name:	Solid State Physics	
Module-level, if applicable:	Undergraduate	
Code:	FI561	
Sub-heading, if applicable:	-	
Classes, if applicable:	-	
Semester:	6th	
Module coordinator:	Wiendartun	
Lecturer(s):	Wiendartun and Endi Suhendi	
Language:	Bahasa Indonesia	
Classification within the curriculum:	Compulsory course	
Type of Teaching:	Contact hours per week during the semester	Class Size
1. Lecture (conceptual, contextual, and problem-solving approaches through expository, discussions and presentation). 2. Structured activities (assignments based on conceptual, contextual, and problem-solving approaches) 3. Self-study (reading literature)	3 hours 20 minutes	45
Workload:	The total workload is 181 hour 20 minutes (6.4 ECTS) per semester, consisting of 46 hour 20 minutes /2800 minutes lectures (1.65 ECTS), 56 hours/3360 minutes structured activities (1.98 ECTS) and 56 hours/3360 minutes self-study (1.98 ECTS) per week for 14 weeks, 22 hour 23 minutes for two exams (0.79 ECTS)	
Credit points:	6.4 ECTS	
Pre-requisites course(s):	FI360 Modern Physics, FI560 Quantum Physics	

<table>
<tr><td>Course Learning Outcomes (CLO):</td><td>After taking this course the students have ability to:
CLO1. Analyze the crystal structure
CLO2. Explain the principle of X-ray diffraction
CLO3. Participate in developing it in the breadth of standard physics disciplines and science and technology in general in the global literature.
CLO4. Analyze the lattice vibrations
CLO5. Analyze the thermal properties of solid
CLO6. Analyze the free electron fermi gas
CLO7. Explain the theory of energy bands
CLO8. Explain the Drude and Sommerfeld theory of metals
CLO9. Analyze the characteristic of Tight-Binding Method</td></tr>
<tr><td>Content:</td><td>Concept of: Crystal Stucture, Xray diffraction, interatomic forces in solid, lattice vibration, thermal properties of solid, Free electron fermi gas, Energy bands, The Drude theory of Metals, The Sommerfeld theory of metals Failures of the Free Electron Model and Classification of Bravais Lattices and Crystal Structures and the Tight-Binding Method.</td></tr>
<tr><td>Study/exam achievements:</td><td>The final mark will be weight as follow:
<table>
<tr><th>No</th><th>CLO</th><th>Assessment Object</th><th>Assessment Techniques</th><th>Weight</th></tr>
<tr><td>1</td><td>CLO1-9

CLO1-5
CLO6-9
CLO5-9</td><td>Subject specific competences:
a. Individual assignments
b. Exam:
- Mid Exam
- Final Exam
c. Presentation</td><td>Written

Written Test
Written Test
Performance</td><td>

20%

30%
30%
20%</td></tr>
<tr><td colspan="4">Total</td><td>100%</td></tr>
</table></td></tr>
<tr><td>Forms of media:</td><td>Board, LCD Projector and Laptop/Computer</td></tr>
<tr><td>Literature:</td><td>1. J.J. Quinn & K. Soo Yi (2009). Solid State Physics, Principles and Modern Applications, Springer, London
2. C. Kittel (2005). Introduction to Solid State Physics, 8th Edition, John Wiley & Sons, New York
3. J.R. Hook & H.E. Hall (2013). Solid State Physics, 2nd Edition, John Wiley & Sons, New York
4. Sólyom, J. (2007). Fundamentals of the physics of solids: Volume 1: Structure and dynamics. Springer.
5. Patterson, J., & Bailey, B. (2011). Solid-state physics: Introduction to the theory. Springer.</td></tr>
</table>

PLO and CLO mapping

	PLO1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10	PLO 11	PLO 12
CLO 1		√										
CLO 2		√										
CLO 3		√										
CLO 4		√										
CLO 5		√										
CLO 6		√										
CLO 7		√										
CLO 8		√										
CLO 9		√										