



MINISTRY OF EDUCATION AND CULTURE
UNIVERSITAS NEGERI SURABAYA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF PHYSICS

Ketintang Campus, Jalan Ketintang, C3 Building, Surabaya 60231
Website: <http://s1-fisika.fmipa.unesa.ac.id/>, email: s1-fisika@unesa.ac.id

Undergraduate Programme In Physics

Module Handbook

Module Name :	<i>Fisika Logam</i> Metal Physics
Module level :	Bachelor degree/Undergraduate Programme
Course Code :	4520102067
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not Applicable
Semester/Term	4/Second Year
Module coordinator(s)	Dr. ZA Imam Supardi, M.Si.
Lecturer(s):	Prof. Dr. Munasir, S.Si., M.Si. Diah Hari Kusumawati, S.Si., M.Si.
Language:	<i>Bahasa Indonesia</i> (Indonesian Language)
Classification within the curriculum:	Compulsory / Elective
Teaching format/class hours per week during the semester:	2 contact hours of lectures (sks or credit unit*)
Workload :	Lecture: 2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester. 79.33 total hours per semester ~ 3.18 ECTS **
Credit Point:	2 sks (3.18 ECTS)
Requirements:	
Learning goals/competencies:	1. Students are able to use symbolic and numerical language in describing the fabrication process, characterization and application of metals 2. Students are able to implement higher order thinking processes (critical, creative, logical, and problem solving) in studying the fabrication process, characterization and application of metals 3. Utilizing information and communication technology for the benefit of strengthening and disseminating scientific physics products by searching relevant journals that discuss the fabrication process, characterization and application of metals (ICT literacy and Technology Skills) 4. Mastering theoretical concepts in the field of physics knowledge in general and theoretical concepts in particular in the fabrication process, characterization and application of metals in depth, as well as being able to formulate procedural problem solving.



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	5. Mastering the material, structure, and concepts of physics and their application in technology										
Content	Understanding the properties of metals and various metal alloys, development of microstructures and mechanical properties, heat treatment of alloys (phase diagrams and phase transformations in metals), metal fabrication, metal characterization, metal corrosion processes and metal applications in industry and life daily.										
Attribute Soft skill:	Scientific report, public speaking, and team work										
Study/exam achievements:	Students are considered to complete the course and pass if they obtain at least 40% of maximum final grade. The final grade (NA) is calculated based on the following ratio: <table border="1"> <thead> <tr> <th>Assessment Components</th><th>Percentage of contribution</th></tr> </thead> <tbody> <tr> <td>Participation</td><td>20%</td></tr> <tr> <td>Assignment</td><td>30%</td></tr> <tr> <td>Mid-semester test</td><td>20%</td></tr> <tr> <td>Final semester test</td><td>30%</td></tr> </tbody> </table>	Assessment Components	Percentage of contribution	Participation	20%	Assignment	30%	Mid-semester test	20%	Final semester test	30%
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Final semester test	30%										
Learning Methods :	Student-centered approach, lecture and discussion, and presentations (structured activities)										
Form of Media:	Power Point slides, e-book file, and multimedia.										
Literature (primary references):	1. Williem D. Callister, Jr., Materials Science and Engineering an Introduction., Sixth Edition, Wiley International Editions., John Wiley & Sons. Inc., 2003. 2. Munasir, Komposit Aluminium Berpenguat Partikel Nano SiO₂ sebagai Material Anti-Korosi pada Medium Geothermal, Disertasi-ITS, 2015. 3. Benjamin Crowell, 2009, " Simple Nature: An Introduction to Physics for Engineering and Physical Science Student", www.lightandmatter.com. 4. Sriati Djaprie (terj. Lawrence H Van Vlack), 1989, "Ilmu dan Teknologi Bahan", Edisi ke lima, Erlangga, Jakarta 5. Brown, Lemay, Bursten, Murphy, "Chemistry the Central Science", 11th eds, Pearson Educational International, 2009, hal. 980 – 1011. 6. Jurnal Material Letters : https://www.journals.elsevier.com/materials-letters/ 7. Jurnal Material Science-Poland: https://content.sciendo.com/view/journals/msp/msp-overview.xml?lang=en&tab_body=container-toc										



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Notes:	*1 credit unit or <i>sks</i> in learning process = three periods consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	**1 credit unit or <i>sks</i> = 1.59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/UN38/HK/AK/2019