



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>Mekanika</i> Mechanics
Module level :	Bachelor degree/Undergraduate Programme
Course Code :	4520104127
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not Applicable
Semester/Term	3/Second Year
Module coordinator(s)	Prof. Dr. Budi Jatmiko, M.Pd
Lecturer(s):	Prof. Dr. Budi Jatmiko, M.Pd Prof. Dr. Munasir, M.Si Woro Setyarsih, S.Pd., M.Si Dr. Dwikoranto, M.Pd Nugrahani Primary Putri, M.Si
Language:	<i>Bahasa Indonesia</i>
Classification within the curriculum:	Compulsory/ Elective
Teaching format/class hours per week during the semester:	4 contact hours of lectures (Indonesia credit semester or sks*)
Workload :	a. Lecture: 3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS b. Lab activity: 1x170 minutes lab activity, 14 weeks per semester 39.67 total hours of lab activity per semester ~ 1.59 ECTS Total of lecture and lab activity= 158.67 total hours per semester ~ 6.36 ECTS**
Credit Point:	4 sks (6.36 ECTS)



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Requirements:	Basics Physics I										
Learning goals/competencies:	1. Using concepts/principles/theories in mechanics deep and critical, apply, analyze, formulate, and solve mechanical problems procedurally. 2. Using software/platform/technology applications such as PhET, Geogebra, Excel, and mathematical and computational approaches, for formulate and explain the concepts/principles/theory of mechanics in solving physics problems. 3. Able to work independently and collaboratively in assessing and solve mechanics problems. 4. Conduct a study of physical phenomena related to internal concepts/principles/theories mechanics in depth for further application 5. Implement higher-order thinking processes (critical, creative, logical, and problem-solving) in analyzing solutions mechanical problems.										
Content	This course examines basic concepts (space and vectors), Newtonian mechanics (kinematics and particle dynamics), harmonic vibration, central force field and gravitational field, transformation frame of reference, particle system dynamics and rigid body mechanics, Lagrangian mechanics and Hamilton equations by applying discussion methods, guided discovery, problem solving, and tutorials for discover, understand, and apply mechanical concepts. Duty independently and in groups as well as presentations on study search results as well applied.										
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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Learning Methods :	1. Student-centered approach, 2. Lecture and discussion, 3. Laboratorium activity 4. Presentations
Form of Media:	<i>Power Point</i> slides, e-book file, and multimedia.
Literature (primary references):	1. Alessandro Bettini, 2016, Undergraduate Lecture Notes in Physics: A course in classical physics 1-Mechanics, Springer International Publishing, Switzerland 2. Benacquista, Mathew J. Romano, Joseph D. 2018, Undergraduate Lecture Notes in Physics: Classical Mechanics. Springer International Publishing AG 3. Helrich, Carl S. 2017. Undergraduate Lecture Notes in Physics: Analytical Mechanics. Springer International Publishing Switzerland. 4. Greiner, W., 2004, Classical Mechanics-Point Particles and Relativity, Springer. 5. Fowles, G R, 1999, Analytical Mechanics, New York: Saunders College Publishing 6. Arya, P. Atam, 1990, Introduction to Classical Mechanics, Prentice Hall 7. Spiegel, M R, 1982, Theory and Problems of Theoretical Mechanics, McGraw-Hill
Notes:	*1 sks 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 sks = 1,59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/Un38/Hk/Ak/2019