



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: <https://pendidikan-fisika.fmipa.unesa.ac.id/>, email: s1-pfis@unesa.ac.id

Undergraduate Programme of Physics Education

Module Handbook

Module Name :	<i>Gelombang</i> Wave
Module level :	Bachelor degree/Undergraduate Programme
Course Code :	8420303081
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not Applicable
Semester/Term	4/Second Year
Module coordinator(s)	
Lecturer(s):	Dra. Madewi Mulyanratna, M.Si Dra. Titin Sunarti, M.Si Asnawi, M. Si Setyo Admoko, M.Pd
Language:	<i>Bahasa Indonesia</i>
Classification within the curriculum:	Compulsory/ Elective
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or sks*)
Workload :	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 135 total hours per semester ~ 4.77 ECTS**
Credit Point:	3 sks (4.77 ECTS)
Requirements:	Basic Physics II
Learning goals/competencies:	<ol style="list-style-type: none">1. Have the ability to use wave concepts and appropriate mathematical/computing methods to get solutions to quantitative problems in waves2. Mastering the materials, structures, and concepts of wave science and their application in technology3. Applying principles, concepts and laws of waves in the form of prototypes of science and technology products that are relevant to the needs of the community4. Implement higher order thinking processes (critical, creative, logical and problem solving) in studying processes and wave phenomena both inductively and inductively.
Content	Waves in more than one dimensional medium: flat waves, water waves, wave equations and their solutions in coordinates Cartesian, sphere and cylinder, reflection and refraction, stationary wave. Transverse mechanical waves, impedance, reflection and transmission, still waves, dispersion, polarization, Fourier technique, modulation.



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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" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">Assessment Components</th> <th style="text-align: left;">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%
	Assessment Components	Percentage of contribution									
	Participation	20%									
	Assignment	30%									
Mid-semester test	20%										
Final semester test	30%										
Learning Methods :	Student-centered approach, lecture and discussion, and presentations (structured activities)										
Form of Media:	<i>Power Point</i> slides, e-book file, and multimedia.										
Literature (primary references):	<ol style="list-style-type: none"> 1. Akira Hirose, Introduction to Wave Phenomena, John Willey & Sons. Inc1985 2. Alonso M & Finn, EI Fundamentals of Physics for the University Volume I. Erlangga Publisher. Jakarta., 1992 3. Tjia May On, Wave, Bandung Institute of Technology, 2005 4. PASCO Scientific 2011, Instruction Sheet by Pasco Scientific, 10101 Fotthills Blvd , PO Box 619011 Roseville CA. 										
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										