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 :	*Fisika Komputasi* Computational Physics
Module level :	Bachelor degree/Undergraduate Programme
Course Code :	4520103061
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not Applicable
Semester/Term	2/First Year
Module coordinator(s)	
Lecturer(s):	
Language:	*Bahasa Indonesia* (Indonesian Language)
Classification within the curriculum:	Compulsory/ ~~Elective~~
Teaching format/class hours per week during the semester:	3 contact hours of lectures (*sks* or credit unit*)
Workload :	a. 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 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= 119 total hours per semester ~ 4.77 ECTS**
Credit Point:	3 sks (4.77 ECTS)
Requirements:	

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Learning goals/competencies:	1. Being able to understand the relationship between theoretical physics, computational physics and experimental physics 2. Being able to model physical phenomena based on interpolation or extrapolation results 3. Being able to make polynomial formulas from physical phenomena 4. Able to model computationally based physics phenomena 5. Able to determine the integral value of a function through a numerical approach
Content	This course examines techniques for solving problems numerically, error analysis, analyzing simple numerical data, evaluating series, finding the roots of non-linear and polynomial equations, solving matrices, solving systems of linear equations, interpolation and extrapolation, forming equations from the resulting data. measurement, inversion method, least-square method, numerical differentiation, numerical integration, and solving ordinary differential equations numerically and solving partial differential equations numerically. Phyton programming assisted calculations
Attribute Soft skill:	Scientific report, public speaking, and team work
Study/exam achievements:	The final grade (NA) is calculated based on the following ratio: **Assessment Components** — **Percentage of contribution** Participation — 20% Assignment — 30% Mid-semester test — 20% Final semester test — 30%
Learning Methods :	1. Student-centered approach, 2. Lecture and discussion, 3. Laboratorium activity 4. Presentations
Form of Media:	*Power Point* slides, e-book file, and multimedia.

The final grade (NA) is calculated based on the following ratio:

Assessment Components	Percentage of contribution
Participation	20%
Assignment	30%
Mid-semester test	20%
Final semester test	30%

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Literature (primary references):	1. Shoichiro Nakamura, 1993, Applied Numerical Methods In C, Prentice-Hall International, Inc, Ohio State University. 2. Suarga, 2007, Fisika Komputasi Solusi Problema Fisika dengan Matlab, Penerbit Andi Yogyakarta 3. Abdul Munif dan Aries Prastyoko Hidayatullah, 2003, Cara Praktis Pengusaan dan Penggunaan Metoda Numerik, Penerbit Guna Wijaya, Surabaya
Notes:	*1 credit unit or *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 credit unit or *sks* = 1.59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/UN38/HK/AK/2019