



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 Medis</i> Medical Physics
Module level :	Bachelor degree/Undergraduate Programme
Course Code :	4520102197
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not Applicable
Semester/Term	7/Fourth Year
Module coordinator(s)	
Lecturer(s):	Dr. Rohim Aminullah Firdaus, S.Pd., M.Si. Dr. Muhimmatul Khoiro, S.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. Explain the concept/principle/theory of medical instrumentation in depth, and be able to formulate mathematical equations and problem solving procedurally 2. Implement higher order thinking processes (critical, creative, logical, and problem solving) in studying concepts/principles/theories of medical instrumentation 3. Analyzing concepts/principles/theories of medical instrumentation through mathematical simulation approaches, computers and their applications 4. Deepen the study of concepts/principles/theories in medical instrumentation as a basis for career development
Content	This course examines medical concepts that include systems for diagnosis, monitoring, and therapy, biomedical signals related to signal sources and characteristics. Methods of biomedical signal analysis, and signal classification such as electrocardiography, electrocardiogram (ECG), and ECG parameters. Biomedical



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	signal analysis with examples of heart-voiced and respiratory-voice signals and ECG. Analysis and classification of breast cancer thermal images. Therapeutic instruments consist of a defibrillator, pacemaker, radiotherapy, and hyperthermia. Next, students do a project of making medical instruments and present the results of medical instruments using power point media in learning achievement. Assessment of learning outcomes is carried out through summative tests (UAS) and medical instrumentation projects										
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):	- Clifford D. Ferris, 1979, Introduction to Bioinstrumentation: With Biological, Environmental, and Medical Applications (Contemporary Instrumentation and Analysis), Humana Press - Articles from various international journals that cover the field of medical instrumentation and are relevant, which have a novelty aspect in the medical / medical field.										
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										