

		<p style="text-align: center;">Universitas Negeri Surabaya Faculty of Mathematics and Natural Sciences Undergraduate Physics Study Program</p>					<p style="text-align: center;">Document Code</p>																																											
SEMESTER LEARNING PLAN																																																		
Courses		CODE	Course Family	Credit Weight			SEMESTER	Compilation Date																																										
Medical Instrumentation		4520102251		T=2	P=0	ECTS=3.18	7	July 18, 2024																																										
AUTHORIZATION		SP Developer		Course Cluster Coordinator			Study Program Coordinator																																											
				Prof. Dr. Munasir, S.Si., M.Si.																																											
Learning model	Case Studies																																																	
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																																	
	Program Objectives (PO)																																																	
	PLO-PO Matrix																																																	
		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 100px; height: 20px;"></td> <td colspan="16" style="text-align: center;">P.O</td> </tr> </table>								P.O																																								
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	PO Matrix at the end of each learning stage (Sub-PO)																																																	
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2" style="width: 50px; height: 20px;"></td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table>																	Week																																
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Short Course Description	<p>In this lecture, basic concepts of medical instrumentation are discussed which include diagnosis, monitoring and therapy systems, biomedical signals related to sources and signal characteristics. Biomedical signal analysis methods, and signal classification such as electrocardiography, electrocardiogram (ECG), and ECG parameters. Biomedical signal analysis with examples of heart-sound and respiratory-sound signals and ECG. Analysis and classification of breast cancer thermal images. Therapeutic instruments consist of defibrillator, pacemaker, radiotherapy and hyperthermia.</p>																																																	
References	Main :																																																	
	<ol style="list-style-type: none"> 1. p> 2. Thomas Sri Widodo, 2012: Interumentasi Medis, Graha Ilmu 3. John G. Webster, 2003, Bioinstrumentation 4. Wiley R.S. Khandpur, 2004. Biomedical Instrumentation : Technology and Application, McGraw-Hill 5. Clifford D. Ferris, 1979, Introduction to Bioinstrumentation: With Biological, Environmental, and Medical Applications (Contemporary Instrumentation and Analysis), Humana Press 6. Artikel dari berbagai jurnal internasional yang cakupannya dibidang istrumentasi medis dan yang relevan, yang memiliki aspek kebaharuan pada bidang kedokteran / medis. 																																																	
	Supporters:																																																	
Supporting lecturer	ASNAWI Dr. Rohim Aminullah Firdaus, S.Pd, M.Si																																																	
Week-	Final abilities of each learning stage (Sub-PO)	Evaluation		Help Learning, Learning methods, Student Assignments, [Estimated time]		Learning materials [References]	Assessment Weight (%)																																											
		Indicator	Criteria & Form	Offline (offline)	Online (online)																																													

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1							0%
2							0%
3							0%
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15							0%
16							0%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
		0%

Notes

- 1. Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
- 2. The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
- 3. Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
- 4. Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
- 5. Indicators for assessing** ability in the process and student learning outcomes are specific and measurable statements that identify the ability or performance of student learning outcomes accompanied by evidence.
- 6. Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
- 7. Forms of assessment:** test and non-test.
- 8. Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
- 9. Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
- 10. Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.

11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.