	Universitas Negeri Surabaya Faculty of Mathematics and Natural Sciences Undergraduate Physics Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Basic Electronics I	4520103041	Compulsory Study Program Subjects	T=2	P=1	ECTS=4.77	3	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	TIM Elektronika Dasar	Imam Sucahyo	Prof. Dr. Munasir, S.Si., M.Si.

Learning model	**Case Studies**	
Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**	
	PLO-3	Develop logical, critical, systematic and creative thinking in carrying out specific work in their field of expertise and in accordance with work competency standards in the field concerned
	PLO-4	Develop yourself continuously and collaborate.
	PLO-7	Communicate their ideas and/or research results in academic writing and speaking effectively.
	PLO-11	Design and conduct experiments in physics learning by applying scientific methods
	PLO-13	Demonstrate knowledge of Classical Physics and Modern Physics
	Program Objectives (PO)	
	PO - 1	Have the ability to think critically and use appropriate concepts to analyze qualitatively and quantitatively in solving direct electric current problems
	PO - 2	Have skills in using electrical measuring instruments and analyzing measurement results
	PO - 3	Have the ability to think critically and use appropriate concepts to analyze qualitatively and quantitatively in solving alternating electric current problems
	PO - 4	Have the ability to think critically and use appropriate concepts to qualitatively analyze the working principles of semiconductors and their applications
	PLO-PO Matrix	

P.O	PLO-3	PLO-4	PLO-7	PLO-11	PLO-13
PO-1	✔				✔
PO-2					
PO-3	✔				
PO-4	✔				

PO Matrix at the end of each learning stage (Sub-PO)

P.O	Week															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PO-1																
PO-2																
PO-3	✔															
PO-4																

Short Course Description	The Basic Electronics 1 course covers two main materials. The first material is the basics of electronics including direct current, alternating current, passive components and the basic principles of measuring instruments and electrical measurements. The second material relates to active components including working principles and applications of semiconductors, pn junctions, diodes, solar transistors (BJT).
References	**Main :** 1. Sutrisno . 1978. Elektronika 1. Teori dan Penerapannya . Bandung: Penerbit ITB Bandung. 2. Tooley, M . 2006. Electronics Circuit: Fundamnetals and Applications. Oxford: Elesevier Ltd. 3. Boylestad, R ., and Nashelsky, L. Electronics Devices and Circuits: Theory. London: Prentice Hall. 4. Floyd, T. L . 2012. Electronics Devices. New York: Prentice Hall. 5. Tim . 2010. Panduan Praktikum Elektronika Dasar 1. Surabaya: Unesa. **Supporters:** 1. 4. Tooley, M. 2006. Electronics Circuit: Fundamnetals and Applications. Third Edition. Elesevier Ltd.
Supporting lecturer	Drs. Imam Sucahyo, M.Si. Dzulkiflih, S.Si., M.T. Abd. Kholiq, S.Pd., M.T. Endah Rahmawati, S.T., M.Si. Meta Yantidewi, S.Si., 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	1.Study contract 2.Analyze the basics of direct current electrical circuits	Students can analyze the basics of direct current electrical circuits		100 minute case study		**Material:** - Understanding Electric Current - Understanding Voltage - Ohm's Law - Electric Power **Library:** *Sutrisno . 1978. Electronics 1. Theory and Application. Bandung: ITB Bandung Publisher.*	0%
2	Analyze the basics of direct current electrical circuits	Students can analyze the basics of direct current electrical circuits	**Form of Assessment** : Participatory Activities	100 minute case study		**Material:** - Understanding Electric Current - Understanding Voltage - Ohm's Law - Electric Power **Library:** *Sutrisno . 1978. Electronics 1. Theory and Application. Bandung: ITB Bandung Publisher.*	1%

3	Analyze direct current electric circuits and characteristics of passive components	Students can analyze direct current electric circuits and the characteristics of passive components	**Form of Assessment** : Participatory Activities	100 minute case study		**Material:** ● Direct Current (DC) ● Resistors in Series and Parallel Circuits ● Voltage Dividers ● Current Dividers ● Thevenin's Theorem ● Norton's Theorem ● Transient Currents ● RC Circuits Library **:** *Sutrisno . 1978. Electronics 1. Theory and Application. Bandung: ITB Bandung Publisher.*	5%
4	Analyze direct current electric circuits and characteristics of passive components	Students can analyze direct current electric circuits and the characteristics of passive components	**Form of Assessment** : Participatory Activities, Practical Assessment	100 minute case study		**Material:** ● Direct Current (DC) ● Resistors in Series and Parallel Circuits ● Voltage Dividers ● Current Dividers ● Thevenin's Theorem ● Norton's Theorem ● Transient Currents ● RC Circuits Library **:** *Sutrisno . 1978. Electronics 1. Theory and Application. Bandung: ITB Bandung Publisher.*	4%
5	Students can apply the use of electrical measuring instruments.	Students can apply the use of electrical measuring instruments.	**Form of Assessment** : Participatory Activities, Practical Assessment	100 minute case study		**Material:** - Basic Meter Use - Basic Meter as Ampere Meter - Basic Meter as Voltmeter - Oscilloscope **Library:** *Tim . 2010. Basic Electronics Practical Guide 1. Surabaya: Unesa.*	4%
6	Analyze the characteristics of electronic components in AC circuits (integrator and differentiator circuits).	Students can analyze the characteristics of electronic components in AC circuits (integrator and differentiator circuits).	**Form of Assessment** : Participatory Activities, Practical Assessment	100 minute case study		**Material:** - AC current - AC current in RC and RLC circuits - Analysis of low pass filters and high pass filters **Reference:** *Sutrisno . 1978. Electronics 1. Theory and Application. Bandung: ITB Bandung Publisher.*	4%

7	Analyze the characteristics of electronic components in AC circuits (integrator and differentiator circuits).	Students can analyze the characteristics of electronic components in AC circuits (integrator and differentiator circuits).	**Form of Assessment** : Participatory Activities, Practical Assessment	100 minute case study		**Material:** - AC current - AC current in RC and RLC circuits - Analysis of low pass filters and high pass filters **Reference:** *Sutrisno . 1978. Electronics 1. Theory and Application. Bandung: ITB Bandung Publisher.*	4%
8	UTS		**Form of Assessment** : Test	100 minute case study			20%
9	Explain the basic properties of semiconductor materials.	Students can explain the basic properties of semiconductor materials.		100 minute case study		**Material:** - Intrinsic Semiconductors - Extrinsic Semiconductors - Generation and Recombination - Diffusion - Diodes - Semiconductors - Forward Bias - Backward Bias - General Characteristics of Diodes **Library:** *Sutrisno. 1978. Electronics 1. Theory and Application. Bandung: ITB Bandung Publisher.*	4%
10	Explain the basic properties of semiconductor materials.	Students can explain the basic properties of semiconductor materials.	**Form of Assessment** : Participatory Activities	100 minute case study		**Material:** - Intrinsic Semiconductors - Extrinsic Semiconductors - Generation and Recombination - Diffusion - Diodes - Semiconductors - Forward Bias - Backward Bias - General Characteristics of Diodes **Library:** *Sutrisno. 1978. Electronics 1. Theory and Application. Bandung: ITB Bandung Publisher.*	4%

11	Implement diode components for waveform processing	Students can apply diode components for waveform processing	**Form of Assessment** : Participatory Activities, Practical Assessment	100 minute case study		**Material:** - diode as a half wave rectifier - diode as a full wave rectifier - diode as a clipper - diode as a clamper - diode as a voltage multiplier **Library:** *Sutrisno. 1978. Electronics 1. Theory and Application. Bandung: ITB Bandung Publisher.*	4%
12	Implement diode components for waveform processing	Students can apply diode components for waveform processing	**Form of Assessment** : Participatory Activities, Practical Assessment	100 minute case study		**Material:** - diode as a half wave rectifier - diode as a full wave rectifier - diode as a clipper - diode as a clamper - diode as a voltage multiplier **Library:** *Sutrisno. 1978. Electronics 1. Theory and Application. Bandung: ITB Bandung Publisher.*	4%
13	Students can solve problems related to the concept of AC to DC rectifiers.	Students can solve problems related to the concept of AC to DC rectifiers.	**Form of Assessment** : Participatory Activities, Practical Assessment	100 minute case study		**Material:** - Half Wave Diode Rectifier - Half Wave Diode Rectifier with Filter - Full Wave Diode Rectifier - Full Wave Diode Rectifier with Filter **Library:** *Sutrisno. 1978. Electronics 1. Theory and Application. Bandung: ITB Bandung Publisher.*	4%
14	Students can solve problems related to the concept of AC to DC rectifiers.	Students can solve problems related to the concept of AC to DC rectifiers.	**Form of Assessment** : Participatory Activities	100 minute case study		**Material:** - Half Wave Diode Rectifier - Half Wave Diode Rectifier with Filter - Full Wave Diode Rectifier - Full Wave Diode Rectifier with Filter **Library:** *Sutrisno. 1978. Electronics 1. Theory and Application. Bandung: ITB Bandung Publisher.*	1%

15	Explain the characteristics of bipolar transistors.	Students can explain the characteristics of bipolar transistors	**Form of Assessment** : Participatory Activities, Portfolio Assessment	100 minute case study		**Material:** - Pole Transistors **Library:** *Sutrisno . 1978. Electronics 1. Theory and Application. Bandung: ITB Bandung Publisher.*	11%
16	UAS		**Form of Assessment** : Test	100 minutes			30%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	30.5%
2.	Portfolio Assessment	5.5%
3.	Practical Assessment	14%
4.	Test	50%
		100%

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.