Semester Lesson Plan (SLP)

	UNIVERSITAS NEGERI SURABAYA, FACULTY OF MATHEMATICS AND NATURAL SCIENCE PHYSICS PROGRAM STUDY	**Document code**

SEMESTER LESSON PLAN

COURSE	CODE	DISCIPLINE	CREDIT UNIT	SEMESTER	CREATED DATE
BASIC ELECTRONICS 1			**2**	3	2 December 2019

AUTHORISATION	AUTHOR	COURSE COORDINATOR	HEAD OF STUDY PROGRAM
PHYSICS DEPARTMENT	**Abd. Kholiq, S.Pd. M.T.**	**Drs. Imam Sucahyo, M.Si.**	**Dr. Munasir, S.Si., M.Si.**

Learning Achievement	**Program Learning Outcome (PLO)**	
	PLO-1	Able to demonstrate knowledge of Classical Physics and Modern Physics
	PLO-2	Able to formulate a physical systems as physical model by using mathematics
	Course Learning Outcome (CLO)	
	CLO1	Having ability to think critically and to use the proper concepts for analyzing quantitatively and qualitatively in solving problems of direct current
	CLO2	Having ability to use electrical measuring instruments and to analyze the results of measurement
	CLO3	Having ability to think critically and to use the proper concepts for analyzing quantitatively and qualitatively in solving problems of alternating current
	CLO4	Having ability to think critically and to use the proper concepts for analyzing qualitatively work principles of semiconductor and its applications
	Final competencies for each learning stage (Sub-CLO)	
	Sub-CLO1	Analyzing the basics of direct current circuits
	Sub-CLO2	Analyzing direct current circuits and characteristics of the passive components
	Sub-CLO3	Applying the usage of electrical measuring instruments
	Sub-CLO4	Analyzing characteristics of the electrical components on AC circuits (integrator and differentiator circuits)
	Sub-CLO5	Explaining basic properties of semiconductor materials
	Sub-CLO6	Applying diode components for waveforms processing
	Sub-CLO7	Solving problems that related with the concepts of AC to DC rectifier
	Sub-CLO8	Explaining the characteristics of bipolar transistor
Course Description	Basic electronics 1 course contain two main materials, the first material is basics of electronics includes: direct currents, alternating currents, passive components, and basic principles of measuring instruments and electrical measurements. The second material is related with active components includes: work principal and application of semiconductors, p-n junctions, and bipolar transistors (BJT).	
Topic Discussion: Learning Materials	1. Basics of Electronics includes: a. Direct currents b. Alternating currents c. Thevenin & Northon analyzing	

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	d. Passive components (RC integrator and differentiator circuits) e. Basic principles of measuring instruments and electrical measurements 2. Active components a. Work principal of semiconductors b. Application of semiconductors c. P-N junctions, Diode d. Characteristics of Diodes e. Diode as signal processing f. Rectifier and power supply g. Bipolar transistors (BJT)
References	**Primary:** 1. Sutrisno. 1978. ***Elektronika 1. Teori dan Penerapannya***. Penerbit ITB Bandung. 2. Tim Elektronika Dasar 1. 2010. ***Panduan Praktikum Elektronika Dasar 1***. 3. Floyd, T. L. 2012. ***Electronics Devices***. Prentice Hall. **Secondary:** 4. Tooley, M. 2006. ***Electronics Circuit: Fundamnetals and Applications***. Third Edition. Elesevier Ltd. 5. Boylestad, R., and Nashelsky, L. **Electronics Devices and Circuits: Theory**. Seventh Edition. Prentice Hall.
Lecturer	1. Drs. Imam Sucahyo, M.Si. 2. Endah Rahmawati, S.T., M.Si. 3. Abd. Kholiq, S.Pd. M.T. 4. Dzulkiflih, S.Si., M.T. 5. Meta Yantidewi, M.Si.
Pre-requisites	Fisika Dasar 2

Week	Final competence in each learning step (Sub-CLO)	Assessment		Aids Learning, Learning Methods, Student Assignments, [Time Estimate]		Learning Material [reference]	Assessment Weight (%)
		Indicator	Criteria & Format	Offline	Online		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1-2	Analyzing the basics of direct current circuits	Students can analyze the basics of direct current circuits		Format: lecture • Discussion • Problem solving	Sharing : - material - information	**Material** - Definition of Electrical currents	

				• Independent assignments • Power point (PPT) Media • Simulation Media Electronic Work-banch (EWB) or Circuit Assignments: independent Time: 4 x 50 minutes	- task	- Definition of Voltages - Ohm's Law - Electrical Power **References** - Elektronika Dasar 1: Chapter 1 Arus Searah - Electronic Circuit: Chapter 1, 2, 3 - Panduan Praktikum Elektronika Dasar 1	
3-4	Analyzing direct current circuits and characteris-tics of the passive components	Students can analyze direct current circuits and characteristics of the passive components		Format: lecture • Discussion • Problem solving • Media Power point (PPT) • Simulation Media Electronic Work-banch (EWB) or Circuit Assignments: independent Time: 4 x 50 minutes	Sharing : - material - information - task	**Material** • Direct Current (DC) • Resistor in Series and Parallel Circuits • Voltage Divider • Current Divider • Thevenin Theorem • Norton Theorem • Transient current • RC circuits **References:** - Elektronika Dasar 1: Chapter 1 Arus Searah - Electronic Circuit: Chapter 1, 2, 3 - Elektronika Dasar 1 - Media Power Point - Media Circuit (simulasi)	

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5	Applying the usage of electrical measuring instruments	Students can apply the usage of electrical measuring instruments		Format: lecture • Discussion • Problem solving • Independent assignments • Media Power point (PPT) • Simulation Media Electronic Work-banch (EWB) or Circuit Assignments: independent Time: 6 x 50 minutes	Sharing : - material - information - task	**Material** - Usage of Basic Meters - Basic Meters as Ampere Meter - Basic Meters as Voltmeter - Oscilloscopes **References** - Elektronika Dasar 1: Chapter 1 Arus Searah - Electronic Circuit: Chapter 1, 2, 3 - Panduan Praktikum Elektronika Dasar 1	
6-7	Analyzing characteristics of the electrical components on AC circuits (integrator and differentiator circuits)	Students can analyze characteristics of the electrical components on AC circuits (integrator and differentiator circuits)		Format: lecture • Discussion • Problem solving • Independent assignments • Media Power point (PPT) • Simulation Media Electronic Work-banch (EWB) or Circuit Assignments: independent Time: 6 x 50 minutes	Sharing : - material - information - task	**Material** - AC currents - AC currents on RC and RLC circuits - Analyzed of low pass filter and high pass filter **References** - Elektronika Dasar 1: Chapter 1 and 2 Arus Searah dan Arus Bolak Balik - Electronic Circuit: Chapter 4 - Panduan Praktikum Elektronika Dasar 1 - Media Power Point	

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						- Media Circuit (simulation)	
8	**Mid Semester Evaluation / Mid Semester Exam**						
9-10	Explaining basic proper-ties of semiconductor materials	Students can explain basic proper-ties of semiconductor materials		Format: lecture • Discussion • Inquiry Guided • Independent assignments • Media Power point (PPT) • Simulation Media Electronic Work-banch (EWB) or Circuit Assignments: groups Time: 6 x 50 minutes	Sharing : - material - information - task	**Material** - Intrinsic Semiconductors - Extrinsic Semikonduktor - Generation dan Recombination - Diffusion - Diode - Semiconductor - Forward Bias - Reverse Bias - General characteristic of Diode **References** - Elektronika Dasar 2: Chapter 3 - Electronic Circuit: Chapter 5 - Electronics Devices and Circuits: Chapter 1, 2 - Electronics Devices: Chapter 1, 2 - Panduan Praktikum Elektronika Dasar 1 - Media Power Point - Media Electronic Workbanch (simulasi)	

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11-12	Applying diode components for waveforms processing	Students can apply diode components for waveforms processing		Format: lecture • Discussion • Problem solving • Exercises • Practicums • Media Power point (PPT) • Simulation Media Electronic Work-banch (EWB) or Circuit Assignments: groups Time: 4 x 50 minutes	Sharing : - material - information - task	**Material** - diode as half-wave rectifier - diode as full-wave rectifier - diode as clipper - diode as clamper - diode as voltage multiplier **References** - Elektronika Dasar 2: Chapter 3 - Electronic Circuit: Chapter 5 - Electronics Devices and Circuits: Chapter 1, 2 - Electronics Devices: Chapter 1, 2 - Panduan Praktikum Elektronika Dasar 1 - Media Power Point - Media Electronic Workbanch (simulation)	
13-14	Solving problems that related with the concepts of AC to DC rectifier	Students can solve problems that related with the concepts of AC to DC rectifier		Format: lecture • Discussion • Problem solving • Exercises • Power point (PPT) Media • Simulation Media Electronic Work-	Sharing : - material - information - task	**Material** - Half-wave rectifier Diode - Half-wave rectifier Diode with filters - Full-wave rectifier Diode - Full-wave rectifier Diode with filters	

				banch (EWB) or Circuit Assignments: groups Time: 4 x 50 minutes		**References** - Elektronika Dasar 2: Chapter 3 and 4 - Electronic Circuit: Chapter 5 - Electronics Devices and Circuits: Chapter 1, 2 - Electronics Devices: Chapter 1, 2 - Panduan Praktikum Elektronika Dasar 1 - Media Power Point - Media Electronic Workbanch (simulation)	
15	Explaining the characteristics of bipolar transistor	Students can explain the characteristics of bipolar transistor		Format: lecture • Discussion • Discovery learning • Exercises • Power point (PPT) media • Simulation Media Electronic Work-banch (EWB) or Circuit Assignments: groups Time: 4 x 50 minutes		**Material** - Bipolar Transistor **References** - Elektronika Dasar 2: Chapter 5 - Electronic Circuit: Chapter 5 - Electronics Devices and Circuits: Chapter 1, 2 - Electronics Devices: Chapter 1, 2 - Panduan Praktikum Elektronika Dasar 1 - Media Power Point - Media Electronic Workbanch (simulation)	
16	**Final Semester Evaluation / Final Semester Exam**						

Notes :

1. **Program Learning Outcome (PLO)** is the ability possessed by each study program graduate which is the internalization of attitudes, mastery of knowledge and skills according to the level of study program obtained through the learning process.
2. **PLO in study program** is some learning outcomes of study program graduate (PLO) to form/develop a course which consists of attitudes, public skills, particular skills and knowledge.
3. **Course learning outcome (CLO)** is the ability which described specifically from PLO in course and is specific to the course content or learning material.
4. **Sub-course learning outcome (Sub-CLO)** is the ability described specifically from CLO that can be measured or observed and is the final ability planned at each learning stage, also is specific to the learning material of the course.
5. **Indicator of ability assessment** in the students learning process and learning outcome is specific and measurable statement that identifying the capability or performance of students learning outcome accompanied by evidence.
6. **Assessment criteria** is the standard used as measures or benchmarks for learning achievement in assessment based on predetermined indicators. Assessment criteria is guidelines for assessor so as the assessment is consistent and unbiased. The criteria can be quantitative or qualitative.
7. **Assessment format:** test and non-test.
8. **Aid Learning:** Lecture, Response, Tutorial, Seminar or else, Practicum, Studio Activity, Workshop Activity, Field Study, Research, Community Services and/or other equivalent learning types.
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 method.
10. **Learning Material** is details or descriptions from course content that can be presented in the form of several subjects and sub-topics.
11. **Assessment weight** is the percentage of assessment toward every sub-CLO achievement which is proportional to the difficulty level of sub-CLO achievement and its total is 100%.