Semester Lesson Plan (SLP)

UNESA	**THE STATE UNIVERSITY OF SURABAYA** **FACULTY OF MATHEMATICS AND NATURAL SCIENCES** **PHYSICS STUDY PROGRAM**	**Document Code**

Semester Lesson Plan

NAME OF COURSE	COURSE CODE	DISCIPLINE	COURSE UNIT		SEMESTER	DATE CREATED
BASIC PHYSICS 2		PHYSICS	T=3 units	P=?	2 (two)	11 Juni 2021

OTORISASI	AUTHOR	COURSE COORDINATOR	HEAD OF PHYSICS STUDY PROGRAM
PHYSICS DEPARTMENT	Prof. Tjipto Prastowo, Ph.D.		Prof. Dr. Munasir, 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)	
	CLO-1	Demonstrating independent, creative and honest characters in doing student assignments, mid and final exams.
	CLO-2	Mastering structured concepts of Classical and Modern Physics.
	CLO-3	Mastering mathematical aspects as an effective tool for understanding physics better through physical modelling.
	CLO-4	Being able to work individually and in a team, showing entrepreneurships, being awareness of environmental issues.
	CLO-5	Demonstrating good behaviours towards religion and cultural values, and nationalities as well as performing student assignments professionally.
	Final competence in each step of learning (Sub-CLO)	
	Sub-CLO1	Being able to understand concepts of electric field, Coulomb interaction, Gauss law.
	Sub-CLO2	Being able to understand concepts of electric potential, electric potential energy, conservation of energy, capacitance and dielectrics.
	Sub-CLO3	Being able to understand concepts of electric current and resistance (Ohm law), electric circuit (Kirchoff law).
	Sub-CLO4	Being able to understand concepts of magneitc field (Biot-Savart law), sources of magnetic field, Faraday law, electromagnetic induction.
	Sub-CLO5	Being able to understand concepts of alternating current, electromagnetic waves.
	Sub-CLO6	Being able to understand concepts of reflection and refraction (Snellius law).
	Sub-CLO7	Being able to understand concepts of image formation by mirrors and lenses.
	Sub-CLO8	Being able to understand principles of optical devices (eyes, lup, microscope, telescope).

Course Content	Basic Physics 2 discusses materials in physics related to the concepts of electricity, magnetism, waves and geometrical optics. Detailed topics in class discussions include electric field, Coulomb interaction, Gauss law, electric potential, electric potential energy, conservation of energy, capacitance and dielectric, electric current and resistance (Ohm law), electric circuit (Kirchoff law), magneitc field (Biot-Savart law), sources of magnetic field, Faraday law, elektromagnetic induction, alternating current, electromagnetic waves, reflection and refraction (Snellius law), mirrors and lenses, optical devices (eyes, lup, microscope, telescope).
Topic Discussions: Learning Materials	1. Concepts of electricity – part 1: electric field, Coulomb interaction, Gauss law 2. Concepts of electricity – part 2: electric potential, electric potential energy, conservation of energy, capacitance and dielectrics 3. Concepts of electricity – part 3: electric current and resistance (hukum Ohm), electric circuit (hukum Kirchoff) 4. Concepts of magnetism – part 1: magneitc field (Biot-Savart law), sources of magnetic field, Faraday law, electromagnetic induction 5. Concepts of magnetism – part 2: alternating current, electromagnetic waves 6. Concepts of optics – part 1: reflection and refraction (Snellius law) 7. Concepts of optics – part 2: mirrors and lenses 8. Concepts of optics – part 3: optical devices (eyes, lup, microscope, telescope)
References	**Primary:**
	1. Nowikow, I. and Heimbecker, B. 2001. Physics: concepts and connections: Book 1. Toronto, Canada: Irwin Publ., pp.1-720. 2. Heimbecker, B., Nowikow, I., Howes, C. T., Mantha, J., Smith, B. P., van Bemmel, H. M. 2002. Physics: concepts and connections: Book 2. Toronto, Canada: Irwin Publ., pp.1-816. 3. Serway, R. A. 2005. College Physics. Belmont, US: Thomson-Learning Publ., pp.1-1058. 4. Abdullah, M. 2017. Fisika Dasar II. E-book. Tidak dipublikasikan. pp. 1-917.
	Secondary:
	Some power point files and/or course materials relevant to Basic Physics 2 from the internet.
Lecturers	1. Prof. Tjipto Prastowo, Ph.D. 2. Meta Yantidewi, S.Si., M.Si.
Pre-requisites	Fisika Dasar 1

Week	**Final competence in each learning step (Sub-CLO)**	**Assessment**		**Learning Format, Methods, Instruction, (Time Allocation)**		**Learning Materials**	**Proportion (%)**
		Indicator	**Criteria & Format**	***offline***	***online***		
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
1	Being able to understand concepts of electric field, Coulomb interaction, Gauss law	Students can explain concepts of electric field,			Contextual Learning Discussions Q & A	Concepts of electricity – part 1: electric field, Coulomb interaction, Gauss law	

		Coulomb interaction, Gauss law					
2	Being able to understand concepts of electric field, Coulomb interaction, Gauss law	Students can explain concepts of electric field, Coulomb interaction, Gauss law			Contextual Learning Discussions Q & A	Concepts of electricity – part 1: electric field, Coulomb interaction, Gauss law	
3	Being able to understand concepts of electric potential, electric potential energy, conservation of energy, capacitance and dielectrics	Students can explain concepts of electric potential, electric potential energy, conservation of energy, capacitance and dielectrics			Contextual Learning Discussions Q & A	Concepts of electricity – part 2: electric potential, electric potential energy, conservation of energy, capacitance and dielectrics	
4	Being able to understand concepts of electric potential, electric potential energy, conservation of energy, capacitance and dielectrics	Students can explain concepts of electric potential, electric potential energy, conservation of energy, capacitance and dielectrics			Contextual Learning Discussions Q & A	Concepts of electricity – part 2: electric potential, electric potential energy, conservation of energy, capacitance and dielectrics	

5	Being able to understand concepts of electric current and resistance (Ohm law), electric circuit (Kirchoff law)	Students can explain concepts of electric current and resistance (Ohm law), electric circuit (Kirchoff law)			Contextual Learning Discussions Q & A	Concepts of electricity – part 3: electric current and resistance (Ohm law), electric circuit (Kirchoff law)	
6	Being able to understand concepts of magneitc field (Biot-Savart law), sources of magnetic field, Faraday law, electromagnetic induction	Students can explain concepts of magneitc field (Biot-Savart law), sources of magnetic field, Faraday law, electromagnetic induction			Contextual Learning Discussions Q & A	Concepts of magnetism – part 1: magneitc field (Biot-Savart law), sources of magnetic field, Faraday law, electromagnetic induction	
7	Being able to understand concepts of magneitc field (Biot-Savart law), sources of magnetic field, Faraday law, electromagnetic induction	Students can explain concepts of magneitc field (Biot-Savart law), sources of magnetic field, Faraday law, electromagnetic induction	Student Assignment 1: handed in		Contextual Learning Discussions Q & A	Concepts of magnetism – part 1: magneitc field (Biot-Savart law), sources of magnetic field, Faraday law, electromagnetic induction	**15%**
8	**Mid Semester Exam**						**20%**
9	Being able to understand concepts of alternating current, electromagnetic waves	Student can explain concepts of alternating current,			Contextual Learning Discussions Q & A	Concepts of magnetism – part 2: alternating current, electromagnetic waves	

		electromagnetic waves					
10	Being able to understand concepts of alternating current, electromagnetic waves	Student can explain concepts of alternating current, electromagnetic waves			Contextual Learning Discussions Q & A	Concepts of magnetism – part 2: alternating current, electromagnetic waves	
11	Being able to understand concepts of reflection and refraction (Snellius law)	Students can explain concepts of reflection and refraction (Snellius law)			Contextual Learning Discussions Q & A	Concepts of optics – part 1: reflection and refraction (Snellius law)	
12	Being able to understand concepts of reflection and refraction (Snellius law)	Students can explain concepts of reflection and refraction (Snellius law)			Contextual Learning Discussions Q & A	Concepts of optics – part 2: mirrors and lenses	
13	Being able to understand concepts of image formation by mirrors and lenses	Students can explain concepts of image formation by mirrors and lenses			Contextual Learning Discussions Q & A	Concepts of optics – part 2: mirrors and lenses	
14	Being able to understand principles of optical devices (eyes, lup, microscope, telescope)	Students can explain principles of optical devices (eyes, lup, microscope, telescope)			Contextual Learning Discussions Q & A	Concepts of optics – part 3: optical devices (eyes, lup, microscope, telescope)	

15	Being able to understand principles of optical devices (eyes, lup, microscope, telescope)	Students can explain principles of optical devices (eyes, lup, microscope, telescope)	Student Assignment 2: handed in		Contextual Learning Discussions Q & A	Concepts of optics – part 3: optical devices (eyes, lup, microscope, telescope)	**15%**
16	**Final Exam**						**30%**