	Universitas Negeri Surabaya Faculty of Engineering, Electrical Engineering Undergraduate Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
ENGINEERING PHYSICS PRACTICUM	2020101261	Compulsory Study Program Subjects	T=1	P=0	ECTS=1.59	2	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	Dr. Lusia Rakhmawati, S.T., M.T.

Learning model	**Project Based Learning**
Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**
	Program Objectives (PO)
	PO - 1 Students are able to understand and analyze several important basic concepts in engineering physics, especially electricity
	PLO-PO Matrix

P.O
PO-1

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																

Short Course Description	This course consists of theory and practice which discusses the basic physics of engineering, especially the basics of electrical engineering. The basic physical sciences presented include vector calculus, magnetostatics, electrodynamics and electromagnetic waves.
References	**Main :**
	1. Serway and Jewett, Physics for scientist and engineers with modern physics Volume 2 nine edition, brooks/cole, University of California, USA, 2014 2. stanford and Tanner, physics for students of science and engineering, georgia institute of technology, UK, 1985
	Supporters:
	1. Hafes A. Radi and John O. Rasmussen, Priciples of physics for scientist and engineers, springer Heidelberg, New York, 2013
Supporting lecturer	Dr. Hj. Euis Ismayati, M.Pd. Dr. Puput Wanarti Rusimamto, S.T., M.T. Miftahur Rohman, S.T., M.T.

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	Students are able to explain and analyze basic concepts of electrical physics	evaluation rubric	**Criteria:** evaluation rubric **Form of Assessment** : Participatory Activities	lecture, presentation, discussion, practicum 1 X 50	lecture, presentation, discussion, practicum 1 X 50	**Material:** basic concepts of electrical physics **Reference:** *Serway and Jewett, Physics for scientists and engineers with modern physics Volume 2 nine edition, brooks/cole, University of California, USA, 2014*	3%
2	Students are able to explain and analyze the basic concepts of Ohm‘s law	evaluation rubric	**Criteria:** evaluation rubric **Form of Assessment** : Participatory Activities	lecture, presentation, discussion, practicum 1 X 50	lecture, presentation, discussion, practicum 1 X 50	**Material:** basic concepts of ohm‘s law **Bibliography:** *Serway and Jewett, Physics for scientists and engineers with modern physics Volume 2 nine edition, brooks/cole, University of California, USA, 2014*	3%
3	Students are able to explain and analyze the basic concepts of Coulomb‘s law	evaluation rubric	**Criteria:** evaluation rubric **Form of Assessment** : Participatory Activities	lecture, presentation, discussion, practicum 1 X 50	lecture, presentation, discussion, practicum 1 X 50	**Material:** basic concepts of Coulomb‘s law **Library:** *stanford and Tanner, physics for students of science and engineering, georgia institute of technology, UK, 1985*	3%
4	Students are able to explain and analyze basic electromagnetic concepts	evaluation rubric	**Criteria:** evaluation rubric **Form of Assessment** : Participatory Activities	lecture, presentation, discussion, practicum 1 X 50	lecture, presentation, discussion, practicum 1 X 50	**Material:** basic concepts of electromagnetic concepts **Bibliography:** *Serway and Jewett, Physics for scientists and engineers with modern physics Volume 2 nine edition, brooks/cole, University of California, USA, 2014*	3%
5	Students are able to explain and analyze the basic concepts of transformer concepts	evaluation rubric	**Criteria:** evaluation rubric **Form of Assessment** : Participatory Activities	lecture, presentation, discussion, practicum 1 X 50	lecture, presentation, discussion, practicum 1 X 50	**Material:** basic transformer concepts **Bibliography:** *Serway and Jewett, Physics for scientists and engineers with modern physics Volume 2 nine edition, brooks/cole, University of California, USA, 2014*	3%

6	Students are able to explain and analyze the basic concepts of Faraday's law	evaluation rubric	**Criteria:** evaluation rubric **Form of Assessment** : Participatory Activities	lecture, presentation, discussion, practicum 1 X 50	lecture, presentation, discussion, practicum 1 X 50	**Material:** basic concepts of Faraday's law **Bibliography:** *Serway and Jewett, Physics for scientists and engineers with modern physics Volume 2 nine edition, brooks/cole, University of California, USA, 2014*	3%
7	Students are able to explain and analyze the basic concepts of electric potential	evaluation rubric	**Criteria:** evaluation rubric **Form of Assessment** : Participatory Activities	lecture, presentation, discussion, practicum 1 X 50	lecture, presentation, discussion, practicum 1 X 50	**Material:** basic concept of electric potential **References:** *Serway and Jewett, Physics for scientists and engineers with modern physics Volume 2 nine edition, brooks/cole, University of California, USA, 2014*	7%
8	UTS	evaluation rubric	**Criteria:** evaluation rubric **Form of Assessment** : Test	Test 1 X 50	Test 1 X 50	**Material:** basic concepts of engineering physics that have been taught during practicum during meetings 1 to 7. **Reference:** *Hafes A. Radi and John O. Rasmussen, Principles of physics for scientists and engineers, springer Heidelberg, New York, 2013*	20%
9	Students are able to explain and analyze basic concepts of analog circuit concepts	evaluation rubric	**Criteria:** evaluation rubric **Form of Assessment** : Participatory Activities	lecture, presentation, discussion, practicum 1 X 50	lecture, presentation, discussion, practicum 1 X 50	**Material:** basic concepts of analog circuits **Bibliography:** *stanford and Tanner, physics for students of science and engineering, georgia institute of technology, UK, 1985*	3%
10	Students are able to explain and analyze the basic concepts of digital circuits	evaluation rubric	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	lecture, presentation, discussion, practicum 1 X 50	lecture, presentation, discussion, practicum 1 X 50	**Material:** basic concepts of digital circuits **Bibliography:** *stanford and Tanner, physics for students of science and engineering, georgia institute of technology, UK, 1985*	3%

11	Students are able to explain and analyze the basic concepts of DC circuit concepts	Evaluation Rubric	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	lecture, presentation, discussion, practicum 1 X 50	lecture, presentation, discussion, practicum 1 X 50	**Material:** basic concepts of DC circuit concepts **References:** *stanford and Tanner, physics for students of science and engineering, georgia institute of technology, UK, 1985*	3%
12	Students are able to explain and analyze the basic concepts of AC circuit concepts	Evaluation Rubric	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	lecture, presentation, discussion, practicum 1 X 50	lecture, presentation, discussion, practicum 1 X 50	**Material:** basic concepts of AC circuit concepts **Reader:** *stanford and Tanner, physics for students of science and engineering, georgia institute of technology, UK, 1985*	3%
13	Students are able to explain and analyze the basic concepts of the Lorentz force concept	Evaluation Rubric	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	lecture, presentation, discussion, practicum 1 X 50	lecture, presentation, discussion, practicum 1 X 50	**Material:** basic concept of Lorentz force **Bibliography:** *Hafes A. Radi and John O. Rasmussen, Principles of physics for scientists and engineers, springer Heidelberg, New York, 2013*	3%
14	Students are able to explain and analyze the basic concepts of magnetic fields	Evaluation Rubric	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	lecture, presentation, discussion, practicum 1 X 50	lecture, presentation, discussion, practicum 1 X 50	**Material:** basic magnetic field concept **Reference:** *Hafes A. Radi and John O. Rasmussen, Principles of physics for scientists and engineers, springer Heidelberg, New York, 2013*	3%
15	Students are able to explain and analyze the basic concepts of electric fields	Evaluation Rubric	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	lecture, presentation, discussion, practicum 1 X 50	lecture, presentation, discussion, practicum 1 X 50	**Material:** basic concepts of electric fields **References:** *Hafes A. Radi and John O. Rasmussen, Principles of physics for scientists and engineers, springer Heidelberg, New York, 2013*	7%

16	UAS	evaluation rubric	**Criteria:** evaluation rubric **Form of Assessment** : Test	Test 1 X 50	Test 1 X 50	**Material:** basic concepts of engineering physics that have been taught during practicum during meetings 9 to 15 **References:** *Hafes A. Radi and John O. Rasmussen, Principles of physics for scientists and engineers, springer Heidelberg, New York, 2013*	30%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	50%
2.	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** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities 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.