	Universitas Negeri Surabaya Vocational Faculty, D4 Electrical Engineering Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Basics of Computers and Programming	99992040102031	Compulsory Study Program Subjects	**T=2**	**P=0**	**ECTS=3.18**	3	December 13, 2023

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
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Learning model	**Project Based Learning**	
Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**	
	PLO-5	Skilled in the application of science and technology in the fields of design, maintenance systems and electrical power engineering to produce prototypes, standard procedures and/or designs as well as compiling the results of the study in the form of working papers, term papers, posters and so on.
	PLO-7	Able to design technical drawings and programming languages using relevant software.
	PLO-8	Able to build the performance or quality of a process through testing, measuring work objects, analyzing and interpreting data according to procedures and standards.
	Program Objectives (PO)	
	PO - 1	Students are able to implement algorithms correctly and structured using Python
	PO - 2	Students can explain the definition and use of algorithms and basic programming
	PO - 3	Students are able to think comprehensively in designing and implementing programs, designing programs in a modular/structured manner with a top-down approach using functions.
	PO - 4	Students are able to think comprehensively in designing and implementing programs, designing programs with an object oriented approach.
	PO - 5	Students are able to communicate and work together in a team through the program documentation mechanism
	PLO-PO Matrix	

P.O	PLO-5	PLO-7	PLO-8
PO-1			
PO-2			
PO-3			
PO-4			
PO-5			

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																
PO-5																

Short Course Description	Basic programming algorithm courses are courses that study concepts, techniques and basic manipulations in a programming language. The material taught includes an introduction to programming languages, basic syntax, variables and data types and functions
References	**Main :**
	1. 1. Cormen. 2009. Introduction to Algoritms 3rd edition. Massachusetts Institute of Technology. 2. Rao. Introduction to Design & Analysis of Algorithms - In Simple Way3. Levitin. 2012. 3. Introduction to The Design and Analysis of Algorithms. 3rd edition. Pearson.
	Supporters:
Supporting lecturer	Ayusta Lukita Wardani, S.ST., M.T. Nur Vidia Laksmi B., S.ST, M.Sc.

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 know the definition and application of algorithms and basic programming	- Understand the definition of an algorithm - Explain the steps for creating an algorithm - Give an example of an algorithm in a case	**Criteria:** **Form of Assessment** : Participatory Activities	Presentations and lectures 2 X 50	Presentations and lectures 2 X 50		1%
2	Students are able to understand, explain the basic structure of algorithms and design/make Algorithm Notation	1. Know the symbols and functions of flowchart symbols 2. 2. Know and apply flowcharts according to design rules that apply universally	**Criteria:** The maximum score per item is 25 **Form of Assessment** : Test	Presentation, discussion and reflection 2X 50	Presentation, discussion and reflection 2X 50		5%
3	Students are able to understand, explain and apply the use of data types in building a program	1. Students are able to understand, explain and apply the use of various types of data according to their use	**Criteria:** The maximum score for each item is 25 if answered correctly **Form of Assessment** : Test	Presentation, group discussion and reflection 2 X 50	Presentation, group discussion and reflection 2 X 50		5%
4	Students are able to understand, explain and apply the use of pointers & keywords in building a program	1. Students are able to understand, explain and apply the use of pointers 2. Students are able to understand, explain and apply the use of keywords	**Criteria:** The maximum score for each item is 25 if answered correctly **Form of Assessment** : Participatory Activities	Presentation, group discussion and reflection 2 X 50	Presentation, group discussion and reflection 2 X 50		5%
5	Students are able to understand algorithm design methods	1. Know the types and differences of operators 2. Understand the use and utilization of operators according to needs 3. Understand operator hierarchy	**Criteria:** The maximum score for each item is 20 if answered correctly	Presentation, simulation and reflection 2X 50	Presentation, simulation and reflection 2X 50		5%

6	Students are able to understand, explain and apply branching techniques	1.1. Know the concept of branching 2.2. Apply branching techniques with one condition	**Criteria:** **Form of Assessment** : Project Results Assessment / Product Assessment	Presentation, simulation and reflection 2 X 50	Presentation, simulation and reflection 2 X 50		5%
7	Students are able to understand algorithm design methods	1.1. Know the branching technique of two or more conditions 2.2. Apply the branching technique of two or more conditions	**Criteria:** **Form of Assessment** : Project Results Assessment / Product Assessment	Presentation, simulation and reflection 2 X 50	Presentation, simulation and reflection 2 X 50		5%
8	UTS		**Form of Assessment** : Project Results Assessment / Product Assessment, Test	2X 50	2X 50		20%
9	Students are able to understand, explain and apply repetition techniques	1.Know the types of repetition techniques 2.Apply repetition techniques to the program according to needs	**Form of Assessment** : Project Results Assessment / Product Assessment	Presentation, simulation, discussion and reflection 2 X 50	Presentation, simulation, discussion and reflection 2 X 50		2%
10	Students are able to understand, explain and apply repetition techniques	1.Know the types of repetition techniques 2.Apply repetition techniques to the program according to needs	**Form of Assessment** : Project Results Assessment / Product Assessment	Presentation, simulation, discussion and reflection 2 X 50	Presentation, simulation, discussion and reflection 2 X 50		2%
11	Students are able to understand, explain and apply the use of functions in a simple program	1.1. Know the definition of function 2.2. Students are able to understand, explain and apply various types of functions based on parameters and return values in a simple program	**Form of Assessment** : Participatory Activities	Presentation, group discussion, simulation and reflection 2 X 50	Presentation, group discussion, simulation and reflection 2 X 50		5%

12	Students are able to understand, explain and apply the use of functions in a simple program	1.1. Know the definition of function 2.2. Students are able to understand, explain and apply various types of functions based on parameters and return values in a simple program	**Form of Assessment** : Participatory Activities	Presentation, group discussion, simulation and reflection 2 X 50	Presentation, group discussion, simulation and reflection 2 X 50		5%
13	Students are able to understand, explain and apply the use of 1 Dimensional arrays	1.1. Understand the use of simple arrays 2.2. Implement the array into the program	**Form of Assessment** : Participatory Activities	Presentation, group discussion, simulation and reflection 2 X 50	Presentation, group discussion, simulation and reflection 2 X 50		5%
14	Students are able to understand, explain and apply the use of Multi-Dimensional arrays	1.1. Understand the use of arrays in matrices 2.2. Implement an array in matrix form into the program	**Form of Assessment** : Participatory Activities, Tests	Presentation, group discussion, simulation and reflection 2 X 50	Presentation, group discussion, simulation and reflection 2 X 50		5%
15	Students are able to understand, explain and apply the use of Multi-Dimensional arrays	1.1. Understand the use of arrays in matrices 2.2. Implement an array in matrix form into the program	**Form of Assessment** : Participatory Activities, Tests	Presentation, group discussion, simulation and reflection 2 X 50	Presentation, group discussion, simulation and reflection 2 X 50		5%
16	Students are able to understand, explain and apply the use of Multi-Dimensional arrays	1.1. Understand the use of arrays in matrices 2.2. Implement an array in matrix form into the program	**Form of Assessment** : Participatory Activities, Tests	Presentation, group discussion, simulation and reflection 2 X 50	Presentation, group discussion, simulation and reflection 2 X 50		5%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	28.5%
2.	Project Results Assessment / Product Assessment	24%
3.	Test	27.5%
		80%

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.