



Universitas Negeri Surabaya
Faculty of Economics and Business
Digital Business Undergraduate Study Program

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight	SEMESTER	Compilation Date																																																																																				
Programming Algorithms	6120903030	Study Program Elective Courses	T=0 P=2 ECTS=3.18	2	November 30, 2022																																																																																				
AUTHORIZATION	SP Developer		Course Cluster Coordinator	Study Program Coordinator																																																																																					
	Anita Safitri, S.Kom., M.Kom., Riska Dhenabayu, S.Kom., M.M.		Anita Safitri, S.Kom., M.Kom.	Hujjatullah Fazlurrahman, S.E., MBA.																																																																																					
Learning model	Project Based Learning																																																																																								
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																																																																																								
	Program Objectives (PO)																																																																																								
	PO - 1	C2. Students are able to understand the concepts of algorithms and programming. C2. Students are able to understand the concept of algorithms and programming.																																																																																							
	PO - 2	C3. Students are able to design appropriate algorithms to solve problems using algorithmic notation. C3. Students are able to design the right algorithm to solve problems using algorithmic notation.																																																																																							
	PO - 3	C3 Students are able to apply algorithms in programming. C3. Students are able to apply an algorithm to a program																																																																																							
	PLO-PO Matrix																																																																																								
		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>P.O</td></tr> <tr><td>PO-1</td></tr> <tr><td>PO-2</td></tr> <tr><td>PO-3</td></tr> </table>	P.O	PO-1	PO-2	PO-3																																																																																			
P.O																																																																																									
PO-1																																																																																									
PO-2																																																																																									
PO-3																																																																																									
PO Matrix at the end of each learning stage (Sub-PO)																																																																																									
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">P.O</th> <th colspan="16">Week</th> </tr> <tr> <th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th><th>15</th><th>16</th> </tr> </thead> <tbody> <tr><td>PO-1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>PO-2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>PO-3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	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																				
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																																																																																									
Short Course Description	This course uses the PJBL (Project Based Learning) method. Discusses theory, concepts and practice of basic programming. The material studied includes an introduction to algorithms, algorithmic notation, programming logic structures in the form of sequential, selection, repetition, getting to know searching and sorting methods and solving problems using programming algorithms. This course uses the PJBL (Project Based Learning) method. This course discusses the theory, concepts, and practice of basic programming. The material studied includes an introduction to algorithms, algorithmic notation, programming logic structures in the form of sequential, selection, iterative, familiar with searching and sorting methods and solving problems using programming algorithms.																																																																																								
References	Main :																																																																																								
	<ol style="list-style-type: none"> Kadir, Abdul. (2019). Logika Pemrograman Python. Jakarta: PT. Elex Media Komputindo. Raharjo, Budi. (2019). Kumpulan Solusi Pemrograman Python Edisi Revisi. Bandung: Informatika. 																																																																																								
	Supporters:																																																																																								
	<ol style="list-style-type: none"> PROJECT BASED LEARNING ALGORITMA PEMROGRAMAN UNTUK BISNIS DIGITAL MEMANFAATKAN TEKNOLOGI METAVERSE ROBLOX DAN ANVIL PYTHON 																																																																																								
Supporting lecturer	Dr. Nanang Hoesen Hidroes Abbrori, S.T., M.T.I. Riska Dhenabayu, S.Kom., M.M. Anita Safitri, M. Kom.																																																																																								

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 understand the basics of algorithms and programming. Students understand the basics of algorithms and programming	<p>1.1.1. Students are able to understand the differences between algorithms and programs. 1.1 Students are able to understand the difference between algorithms and programs</p> <p>2.1.2. Students are able to understand various forms of algorithm writing. 1.2 Students are able to understand various forms of writing algorithms.</p> <p>3.1.3. Students are able to understand the program creation cycle. 1.3 Students are able to understand the programming cycle.</p>	<p>Criteria: Non-test form of holistic rubric</p> <p>Form of Assessment : Test</p>	Lectures, Discussions 3x50	<p>Synchronous Discussion Google Classroom (discussion) Google Meet (lecture) Vilearn Unesa (discussion) [PB: 1x(3x50")]</p> <p>Assignment 1: Read and learn about the basics of algorithms and programming</p> <p>Assignment 1 : Read and learn about the basics of algorithms and programming [PT KM: (1 1)x(3x60")] 3x50</p>	<p>Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i></p> <p>Material: Python Programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i></p>	2%
2	Learn and understand writing algorithmic notation Learn and understand writing algorithmic notation	<p>1.2.1. Able to write algorithms in descriptive form</p> <p>2.2.2. Able to write algorithms in the form of flow diagrams</p> <p>3.2.3. Able to write algorithms in pseudo code form</p>	<p>Criteria: Non-test form of holistic rubric</p> <p>Form of Assessment : Participatory Activities, Practice/Performance</p>	Lectures, Discussions 3x50	<p>Synchronous Discussion Google Classroom (discussion) Google Meet (lecture) Vilearn Unesa (discussion) [PB: 1x(3x50")]</p> <p>Task 2: Write algorithms in descriptive form, flow diagrams and pseudo code .</p> <p>Assignment 2: Write algorithms in descriptive form, flow charts, and pseudo code. [PT KM: (1 1)x(3x50")] 3x50</p>	<p>Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i></p> <p>Material: Python programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i></p>	5%

3	Able to understand types of data types and operators, know Variables and Functions, Input/Output and Files. Able to understand the types of data types and operators, Variables and Functions, Input/Output and Files.	<p>1.3.1. Able to recognize and understand types of data types</p> <p>2.3.2. Able to recognize and understand the types of operators</p> <p>3.3.3 Able to recognize and understand the concept of variables</p> <p>4.4.1 Able to recognize and understand the concept of functions and procedures</p> <p>5.4.2 Able to recognize and understand the concept of input/output and files</p>	<p>Criteria: Non-test form of holistic rubric</p> <p>Form of Assessment : Participatory Activities</p>	discussion, lecture, practicum 3x50	<p>Synchronous Discussion Google Classroom (discussion) Google Meet (lecture) Vilearn Unesa (discussion) [PB: 2x(3x50")]</p> <p>Post Test 1 Meeting material 1 to 4 [PT KM: (2 1)x(3x50")] 3x50</p>	<p>Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i></p> <p>Material: Python Programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i></p>	2%
4	Able to understand types of data types and operators, know Variables and Functions, Input/Output and Files. Able to understand the types of data types and operators, Variables and Functions, Input/Output and Files.	<p>1.3.1. Able to recognize and understand types of data types</p> <p>2.3.2. Able to recognize and understand the types of operators</p> <p>3.3.3 Able to recognize and understand the concept of variables</p> <p>4.4.1 Able to recognize and understand the concept of functions and procedures</p> <p>5.4.2 Able to recognize and understand the concept of input/output and files</p>	<p>Criteria: Non-test form of holistic rubric</p> <p>Form of Assessment : Participatory Activities, Practice/Performance</p>	discussion, lecture, practicum 3x50	<p>Synchronous Discussion Google Classroom (discussion) Google Meet (lecture) Vilearn Unesa (discussion) [PB: 2x(3x50")]</p> <p>Post Test 1 Meeting material 1 to 4 [PT KM: (2 1)x(3x50")] 3x50</p>	<p>Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i></p> <p>Material: Python Programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i></p>	3%
5	Able to understand logical structures in sequential programming, selection and repetition and apply them in pseudocode or programming languages. Able to understand logical structures in sequential programming, selection, and looping	<p>1.5.1. Able to recognize and understand the logical structure of sequential programming</p> <p>2.6.1 Able to recognize and understand the logical structure in selection programming</p> <p>3.7.1 Able to recognize and understand the logical structure in repetition programming</p>	<p>Criteria: Non-test form of holistic rubric</p> <p>Form of Assessment : Participatory Activities</p>	Practical 3x50		<p>Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i></p> <p>Material: Python Programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i></p>	4%

6	Able to understand logical structures in sequential programming, selection and repetition and apply them in pseudocode or programming languages. Able to understand logical structures in sequential programming, selection, and looping	1.5.1. Able to recognize and understand the logical structure of sequential programming 2.6.1 Able to recognize and understand the logical structure in selection programming 3.7.1 Able to recognize and understand the logical structure in repetition programming	Criteria: Non-test form of holistic rubric Form of Assessment : Participatory Activities	Practical 3x50		Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i> Material: Python Programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i>	4%
7	Able to understand logical structures in sequential programming, selection and repetition and apply them in pseudocode or programming languages. Able to understand logical structures in sequential programming, selection, and looping	1.5.1. Able to recognize and understand the logical structure of sequential programming 2.6.1 Able to recognize and understand the logical structure in selection programming 3.7.1 Able to recognize and understand the logical structure in repetition programming	Criteria: Non-test form of holistic rubric Form of Assessment : Participatory Activities, Practice/Performance	Practical 3x50	3x50	Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i> Material: Python Programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i>	4%
8	Mid Term Exam Mid Term Exam	Midterm exam	Criteria: Holistic Rubric Test Form (UTS) Form of Assessment : Test	Midterm Exam 90	Online Midterm Exam 90	Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i> Material: Python Programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i>	20%

9	Able to understand List, Dictionary, Turple and Set. Able to create Classes and Objects. Able to create Abke functions to understand List, Dictionary, Turple and Set. Able to develop Classes and Objects. Able to develop Function.	1.9.1 Able to understand and form functions 2.10.1 Able to understand and apply lists, dictionaries, turples and sets 3.11.1 Able to understand and apply the formation of classes and objects	Criteria: Non-test form of holistic rubric Form of Assessment : Participatory Activities, Practice/Performance	Practical 3x50	Synchronous Discussion Google Classroom (discussion) (discussion) Google Meet (lecture) (lecture) Vilearn Unesa (discussion) (discussion). [PB: 3x(3x50")] Assignment 4: Practical report regarding the formation of functions, application of lists, dictionaries, turples and sets, formation of classes and objects. Assignment 4: Practicum report on function formation, application list, dictionary, turple and set, class and object formation. [PT KM: (3 3)x(3x60") 3x50	Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i> Material: Python Programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i>	3%
10	Able to understand List, Dictionary, Turple and Set. Able to create Classes and Objects. Able to create Abke functions to understand List, Dictionary, Turple and Set. Able to develop Classes and Objects. Able to develop Function.	1.9.1 Able to understand and form functions 2.10.1 Able to understand and apply lists, dictionaries, turples and sets 3.11.1 Able to understand and apply the formation of classes and objects	Criteria: Non-test form of holistic rubric Form of Assessment : Participatory Activities	Practical 3x50	Synchronous Discussion Google Classroom (discussion) (discussion) Google Meet (lecture) (lecture) Vilearn Unesa (discussion) (discussion). [PB: 3x(3x50")] Assignment 4: Practical report regarding the formation of functions, application of lists, dictionaries, turples and sets, formation of classes and objects. Assignment 4: Practicum report on function formation, application list, dictionary, turple and set, class and object formation. [PT KM: (3 3)x(3x60") 3x50	Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i> Material: Python Programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i>	3%
11	Able to understand List, Dictionary, Turple and Set. Able to create Classes and Objects. Able to create Abke functions to understand List, Dictionary, Turple and Set. Able to develop Classes and Objects. Able to develop Function.	1.9.1 Able to understand and form functions 2.10.1 Able to understand and apply lists, dictionaries, turples and sets 3.11.1 Able to understand and apply the formation of classes and objects	Criteria: Non-test form of holistic rubric Form of Assessment : Participatory Activities	Practical 3x50	Synchronous Discussion Google Classroom (discussion) (discussion) Google Meet (lecture) (lecture) Vilearn Unesa (discussion) (discussion). [PB: 3x(3x50")] Assignment 4: Practical report regarding the formation of functions, application of lists, dictionaries, turples and sets, formation of classes and objects. Assignment 4: Practicum report on function formation, application list, dictionary, turple and set, class and object formation. [PT KM: (3 3)x(3x60") 3x50	Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i> Material: Python Programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i>	3%

12	Understand and apply GUI programming. Able to understand and apply the concept of searching and sorting algorithms, namely Linear and Binary Searching, Bubble Sorting, Selection Sorting, and Insertion Sorting. Able to understand and apply the concept of searching and sorting algorithms, namely Linear and Binary Searching, Bubble Sorting, Selection Sorting, and Insertion Sorting.	<p>1.12.1 Students understand the meaning, function and how GUI works</p> <p>2.12.2 Students understand the advantages, disadvantages, and examples of GUIs</p> <p>3.12.3 Students understand GUI design and simple GUI programming</p>	<p>Criteria: Non-test form of holistic rubric</p> <p>Forms of Assessment : Participatory Activities, Practical Assessment, Practical / Performance</p>	Lectures, Discussions, Presentations 3 X 50		<p>Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i></p> <hr/> <p>Material: Python Programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i></p>	5%
13	Understand and apply GUI programming. Able to understand and apply the concept of searching and sorting algorithms, namely Linear and Binary Searching, Bubble Sorting, Selection Sorting, and Insertion Sorting. Able to understand and apply the concept of searching and sorting algorithms, namely Linear and Binary Searching, Bubble Sorting, Selection Sorting, and Insertion Sorting.	<p>1.13.1 Able to understand the concepts of linear searching and binary searching</p> <p>2.14.1 Able to understand the concepts of bubble sorting and selection sorting</p> <p>3.15.1 Able to understand the concept of insertion sorting</p>	<p>Criteria: Non-test form of holistic rubric</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, Discussions, Practicum 3x50		<p>Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i></p> <hr/> <p>Material: Python Programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i></p>	3%
14	Understand and apply GUI programming. Able to understand and apply the concept of searching and sorting algorithms, namely Linear and Binary Searching, Bubble Sorting, Selection Sorting, and Insertion Sorting. Able to understand and apply the concept of searching and sorting algorithms, namely Linear and Binary Searching, Bubble Sorting, Selection Sorting, and Insertion Sorting.	<p>1.13.1 Able to understand the concepts of linear searching and binary searching</p> <p>2.14.1 Able to understand the concepts of bubble sorting and selection sorting</p> <p>3.15.1 Able to understand the concept of insertion sorting</p>	<p>Criteria: Non-test form of holistic rubric</p> <p>Form of Assessment : Participatory Activities</p>	Lectures, Discussions, Practicum 3x50		<p>Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i></p> <hr/> <p>Material: Python Programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i></p>	3%

15	Understand and apply GUI programming. Able to understand and apply the concept of searching and sorting algorithms, namely Linear and Binary Searching, Bubble Sorting, Selection Sorting, and Insertion Sorting. Able to understand and apply the concept of searching and sorting algorithms, namely Linear and Binary Searching, Bubble Sorting, Selection Sorting, and Insertion Sorting.	1.13.1 Able to understand the concepts of linear searching and binary searching 2.14.1 Able to understand the concepts of bubble sorting and selection sorting 3.15.1 Able to understand the concept of insertion sorting	Criteria: Non-test form of holistic rubric Form of Assessment : Participatory Activities, Practice/Performance	Lectures, Discussions, Practicum 3x50		Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i> Material: Python Programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i>	10%
16	Final Semester Exam Final Semester Exam	Non-test form of holistic rubric	Criteria: Non-test form of holistic rubric Form of Assessment : Test	Final Project 90 Presentation	Online Final Project Presentation 90	Material: Python programming logic Reader: <i>Kadir, Abdul. (2019). Python Programming Logic. Jakarta: PT. Elex Media Komputindo.</i> Material: Python Programming Reader: <i>Raharjo, Budi. (2019). Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.</i>	25%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	36.17%
2.	Practical Assessment	1.67%
3.	Practice / Performance	14.17%
4.	Test	47%
		99.01%

Notes

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Forms of assessment:** test and non-test.
- 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.