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

SEMESTER LEARNING PLAN

Courses		CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
programming algorithm		6120901012	Compulsory Study Program Subjects	T=1	P=2	ECTS=4.77	1	November 30, 2021
AUTHORIZATION		**SP Developer**		**Course Cluster Coordinator**			**Study Program Coordinator**	
		Anita Safitri, S.Kom., M.Kom., Riska Dhenabayu, S.Kom., M.M.		Riska Dhenabayu, S.Kom., M.M.			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 Students are able to understand the concepts of algorithms and programming
	PO - 2 Students are able to design appropriate algorithms to solve problems using algorithmic notation
	PO - 3 Students are able to apply algorithms in programming
	PLO-PO Matrix

P.O
PO-1
PO-2
PO-3

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																

Short Course Description	This course 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 discusses the theory, concepts and practice of basic programming. The material studied includes 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 :**

1. Kadir, Abdul. 2019. Logika Pemrograman Python. Jakarta: PT. Elex Media Komputindo.
2. Raharjo, Budi. 2019. Kumpulan Solusi Pemrograman Python Edisi Revisi. Bandung: Informatika.
3. Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Implementasi Algoritma dalam Bahasa Python . Bandung: Informatika Bandung.

Supporters:

1. PROJECT BASED LEARNING ALGORITMA PEMROGRAMAN UNTUK BISNIS DIGITAL MEMANFAATKAN TEKNOLOGI METAVERSE ROBLOX DAN ANVIL PYTHON

Supporting lecturer	Dr. Purwohandoko, M.M. Riska Dhenabayu, S.Kom., M.M. Hujjatullah Fazlurrahman, S.E., MBA. Achmad Kautsar, S.E., M.M.						
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	Understand the basics of algorithms and programming Understand the basics of algorithms and programming	1.1.1. Students are able to understand the differences between algorithms and programs 2.1.2. Students are able to understand various forms of algorithm writing 3.1.3. Students are able to understand the program creation cycle	**Criteria:** Holistic rubric Non-test form **Forms of Assessment** : Participatory Activities, Practical Assessment, Practical / Performance	Discussion, lecture, practicum 3 X 50	Syncronous Discussion Google Classroom (discussion) (discussion) Google Meet (lecture) (lecture) Vilearn Unesa (discussion) (discussion) [PB: 1x(3x50")] Assignment 1: Read and learn about the basics of algorithms and programming 3 50	**Material:** Python programming logic **Reader:** *Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.* **Material:** Python Programming **Reader:** *Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.* **Material:** Python Programming Algorithms **Readers:** *Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung.*	3%

| 2 | Learn and understand writing algorithmic notation Learn and understand writing algorithmic notation | 1.2.1. Able to write algorithms in descriptive form 2.2.2. Able to write algorithms in the form of flow diagrams 3.2.3. Able to write algorithms in pseudo code form | **Criteria:** Non-test form of holistic rubric **Form of Assessment** : Participatory Activities, Practical Assessment | Discussion, lecture, Practicum 3 X 50 | Syncronous Discussion Google Classroom (discussion) (discussion) Google Meet (lecture) (lecture) Vilearn Unesa (discussion) (discussion) [PB: 1x(3x50")] Task 2: Write algorithms in descriptive form, flow diagrams and pseudo code . Assignment 2: Write algorithms in descriptive form, flow charts, and pseudo code. [PT KM: (1 1)x(3x50")] 3 X 50 | **Material:** Python programming logic **Reader:** *Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.* **Material:** Python Programming **Reader:** *Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.* **Material:** Python programming algorithm **Reader:** *Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung.* | 3% |
| 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, know Variables and Functions, Input/Output and Files. | 1.3.1. Able to recognize and understand types of data types 2.3.2. Able to recognize and understand the types of operators 3.3.3 Able to recognize and understand the concept of variables 4.4.1 Able to recognize and understand the concept of function 5.4.2 Able to recognize and understand the concept of input/output and files | **Criteria:** Holistic rubric Non-test form **Forms of Assessment** : Participatory Activities, Practical Assessment, Practical / Performance | Discussion, lecture, practicum 3x50 | Syncronous Discussion Google Classroom (discussion) (discussion) Google Meet (lecture) (lecture) Vilearn Unesa (discussion) (discussion) [PB: 2x(3x50")] Post Test 1 Meeting material 1 to 4 [PT KM: (2 1)x(3x50")] 3x50 | **Material:** Python programming logic **Reader:** *Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.* **Material:** Python Programming **Reader:** *Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.* **Material:** Python programming algorithm **Reader:** *Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung.* | 3% |

| 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, know Variables and Functions, Input/Output and Files. | 1. 3.1. Able to recognize and understand types of data types
2. 3.2. Able to recognize and understand the types of operators
3. 3.3 Able to recognize and understand the concept of variables
4. 4.1 Able to recognize and understand the concept of function
5. 4.2 Able to recognize and understand the concept of input/output and files | **Criteria:**
Holistic rubric
Non-test form

Forms of Assessment :
Participatory Activities, Practical Assessment, Practical / Performance | Discussion, lecture, practicum 3x50 | Syncronous Discussion Google Classroom (discussion) (discussion) Google Meet (lecture) (lecture) Vilearn Unesa (discussion) (discussion) [PB: 2x(3x50")]

Post Test 1 Meeting material 1 to 4 [PT KM: (2 1)x(3x50")] 3x50 | **Material:** Python programming logic **Reader:** *Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.*

Material: Python Programming **Reader:** *Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.*

Material: Python programming algorithm **Reader:** *Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung.* | 3% |
| 5 | Able to understand logical structures in sequential programming, selection and repetition. Able to understand logical structures in sequential programming, selection and repetition. | 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

Forms of Assessment :
Participatory Activities, Practical Assessment, Practical / Performance | Discussion, lecture, practicum 3x50 | Online discussions, online lectures, 3x50 independent practicum | **Material:** Python programming logic **Reader:** *Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.*

Material: Python Programming **Reader:** *Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.*

Material: Python programming algorithm **Reader:** *Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung.* | 3% |

| 6 | Able to understand logical structures in sequential programming, selection and repetition. Able to understand logical structures in sequential programming, selection and repetition. | 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

Forms of Assessment : Participatory Activities, Practical Assessment, Practical / Performance | Discussion, lecture, practicum 3x50 | Online discussions, online lectures, 3x50 independent practicum | **Material:** Python programming logic **Reader:** *Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.*

Material: Python Programming **Reader:** *Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.*

Material: Python programming algorithm **Reader:** *Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung.* | 3% |
| 7 | Able to understand logical structures in sequential programming, selection and repetition. Able to understand logical structures in sequential programming, selection and repetition. | 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

Forms of Assessment : Participatory Activities, Practical Assessment, Practical / Performance | Discussion, lecture, practicum 3x50 | Online discussions, online lectures, 3x50 independent practicum | **Material:** Python programming logic **Reader:** *Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.*

Material: Python Programming **Reader:** *Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.*

Material: Python programming algorithm **Reader:** *Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung.* | 3% |

8	Midterm Evaluation/Midterm ExamMidterm Exam			Midterm Exam 90	Online Midterm Exam 90	**Material:** Python programming logic **Reader:** *Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.* **Material:** Python Programming **Reader:** *Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.* **Material:** Python programming algorithm **Reader:** *Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung.*	20%
9	Able to understand List, Dictionary, Turple and Set. Able to create Classes and Objects. Able to create Functions.	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 **Forms of Assessment** : Participatory Activities, Practical Assessment, Practical / Performance	Discussion, lecture, practicum 3x50	Syncronous 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(3x50")] 3x50	**Material:** Python programming logic **Reader:** *Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.* **Material:** Python Programming **Reader:** *Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.* **Material:** Python programming algorithm **Reader:** *Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung.*	3%

| 10 | Able to understand List, Dictionary, Turple and Set. Able to create Classes and Objects. Able to create Functions. | 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

Forms of Assessment : Participatory Activities, Practical Assessment, Practical / Performance | Discussion, lecture, practicum 3x50 | Syncronous 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(3x50")] 3x50 | **Material:** Python programming logic **Reader:** *Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.*

Material: Python Programming **Reader:** *Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.*

Material: Python programming algorithm **Reader:** *Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung.* | 3% |
| 11 | Able to understand List, Dictionary, Turple and Set. Able to create Classes and Objects. Able to create Functions. | 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

Forms of Assessment : Participatory Activities, Practical Assessment, Practical / Performance | Discussion, lecture, practicum 3x50 | Syncronous 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(3x50")] 3x50 | **Material:** Python programming logic **Reader:** *Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.*

Material: Python Programming **Reader:** *Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.*

Material: Python programming algorithm **Reader:** *Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung.* | 3% |

| 12 | Applying GUI programming | 1. 12.1 Students understand the meaning, function and how GUI works
2. 12.2 Students understand the advantages, disadvantages, and examples of GUIs
3. 12.3 Students understand GUI design and simple GUI programming | **Criteria:**
3

Forms of Assessment : Participatory Activities, Practical Assessment, Practical / Performance | Criteria: Holistic rubric Non-test form: Summarizing course material Criteria: Holistic rubric Non-test form: Summarizing course material
3 X 50 | | **Material:** Python programming logic **Reader:** Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.

Material: Python Programming **Reader:** Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.

Material: Python programming algorithm **Reader:** Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung. | 3% |
| 13 | Able to understand the concept of searching and sorting algorithms, namely Linear and Binary Searching, Bubble Sorting, Selection Sorting, and Insertion Sorting. Able to understand 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

Forms of Assessment : Participatory Activities, Practical Assessment, Practical / Performance | Discussion, lecture, practicum 3x50 | 3x50 | **Material:** Python programming logic **Reader:** Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.

Material: Python Programming **Reader:** Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.

Material: Python programming algorithm **Reader:** Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung. | 3% |

| 14 | Able to understand the concept of searching and sorting algorithms, namely Linear and Binary Searching, Bubble Sorting, Selection Sorting, and Insertion Sorting. Able to understand 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

Forms of Assessment : Participatory Activities, Practical Assessment, Practical / Performance | Discussion, lecture, practicum 3x50 | 3x50 | **Material:** Python programming logic
Reader: *Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.*

Material: Python Programming
Reader: *Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.*

Material: Python programming algorithm
Reader: *Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung.* | 3% |
| 15 | Able to understand the concept of searching and sorting algorithms, namely Linear and Binary Searching, Bubble Sorting, Selection Sorting, and Insertion Sorting. Able to understand 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

Forms of Assessment : Participatory Activities, Practical Assessment, Practical / Performance | Discussion, lecture, practicum 3x50 | 3x50 | **Material:** Python programming logic
Reader: *Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.*

Material: Python Programming
Reader: *Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.*

Material: Python programming algorithm
Reader: *Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung.* | 3% |

| 16 | Final Semester Evaluation / Final Semester Examination Final Semester Examination | Final exams | **Criteria:** Holistic Rubric test form (UAS) | Final Semester Exam 3x50 | Online Final Semester Exam 3x50 | **Material:** Python programming logic **Reader:** *Kadir, Abdul. 2019. Python Programming Logic. Jakarta: PT. Elex Media Komputindo.*

Material: Python Programming **Reader:** *Raharjo, Budi. 2019. Collection of Python Programming Solutions Revised Edition. Bandung: Informatics.*

Material: Python programming algorithm **Reader:** *Wendi Zarman, & Mochamad Fajar Wicaksono. 2020. Algorithm Implementation in Python Language. Bandung: Informatics Bandung.* | 25% |

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	14.5%
2.	Practical Assessment	14.5%
3.	Practice / Performance	13%
		42%

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.