



Universitas Negeri Surabaya Faculty of Mathematics and Natural Sciences Data Science Undergraduate Study Program

Courses		COD	E			Cou	ırse F	amil	У	С	edit	t Wei	ght	5	SEMES	STER	Cor	mpilatio
Basic Progra	ımming	4920	203003				npuls gram			T:	2 1	P=1	ECTS=4.	77	:	1	Aug 202	gust 10,
AUTHORIZATION SI		SP D	eveloper	,					rse Cl	uste	er Co	ordinator	9	Study I	Progra		ordinato	
		Risky	yana Dewi	Intan	Puspit	asari,	M.Ko	om	Dr. A	Atik Wi	ntart	ti, M.ŀ	Kom	,	Yuliani	Puji As	stuti, S	.Si., M.S
Learning model	Project Base	ed Learning	I Learning															
Program	PLO study program that is charged to the course																	
Learning Outcomes (PLO)	PLO-10	Able to use technology in the field of data science																
	PLO-18	Mastering ir problems	nformation	techno	ology	conce	pts bo	oth in	terms	of con	puti	ing a	nd data ma	ınag	ement	to solv	e data	science
	Program Objectives (PO)																	
	PO - 1																	
	PO - 2	Able to use programming software in the field of data science																
	PO - 3	Able to apply simple algorithms to computer programs																
	PO - 4	O - 4 Able to show cooperation and be responsible for programming tasks																
	PLO-PO Matrix																	
		PO PO PO	-2 -3 -4															
	PO Matrix a	t the end of ea	ach learn	ing st	age (Sub-l	PO)											
		P.C)								Wee	ek						
			1	. 2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		PO-1																
		PO-2																
		PO-3																
		PO-4																
Short Course Description	The study ma	main aim is to aterial includes I ram creation pro	pasic prog	rammi	nġ, for	m coi	nditio	ns, re	petitio	n, func								
References	Main :																	

1.	Swaroop, C. H. 2013. A Byte of Python . Packt Publishing	
2	Chay 7 2014 Loars Dython The Hard Way 2rd Edition Addison	٠,

Shaw, Z. 2014. Learn Python The Hard Way 3rd Edition . Addison-Wesley
 Puspitasari, R. 2022, Modul Pembelajaran Pemrograman Dasar. (In Press)
 Software Programming: Python 3 (www.python.org)

Supporting lecturer

Dr. Atik Wintarti, M.Kom. Dr. Elly Matul Imah, M.Kom. Hasanuddin Al-Habib, M.Si. Riskyana Dewi Intan Puspitasari, M.Kom. Fadhilah Qalbi Annisa, S.T., M.Sc.

Week-	Final abilities of each learning stage (Sub-PO)		ation	Learn Studen [Est	p Learning, ling methods, t Assignments, timated time]	Learning materials [References]	Assessment Weight (%)
	(843 1 8)	Indicator	Criteria & Form	Offline (offline)	Online (online)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Students are able to understand basic programming concepts.	1.Students get to know the history of programming languages 2.Students get to know the basic concepts of programming 3.Students are able to explain and implement programming logic and flowcharts 4.Students can explain the use of variables, statements and operators in programming	Criteria: Non-Test Form of Assessment: Participatory Activities	Scientific Approach: observing, asking, exploring. Method: lecture, discussion, question and answer, giving assignments Learning Strategy: accentuation of information processing (cognitive) 3 X 50		Material: Basic programming concepts References: Kuhlman, D. 2013 . A Python Book: Beginning Python, Advanced Python, and Python Exercises. M.I. T Material: Python Programming, Data Types, Variables, Library: William F. Punch, Richard Enbody, 2018, Practice of Computing Using Python, The, Global Edition, Pearson Education	2%
2	Integrate selection program controls to resolve a case	1. Defines the ifelse syntax for selecting a condition 2. Defines a switch case with conditions of integer data type 3. Defines a switch case with conditions of the character data type. 4. Create a simple program that contains ifelse syntax to solve problems with certain conditions	Criteria: Practical Test Form of Assessment: Practical Assessment	Scientific Approach: observing, asking, exploring. Method: lecture, discussion, question and answer, giving assignments Learning Strategy: accentuation of information processing (cognitive) 3 X 50		Material: Selection control References: Kuhlman, D. 2013 . A Python Book: Beginning Python, Advanced Python, and Python Exercises. M.I.T Material: Nested if-else Bibliography: William F. Punch, Richard Enbody, 2018, Practice of Computing Using Python, The, Global Edition, Pearson Education	2%

3	Integrate program	1.Defines a for	Criteria:	Scientific	Material:	2%
	control of for loops to solve a case	loop to solve loop cases 2.Create a program that contains for to solve the loop case 3.Defines a nested for loop 4.Create a program that contains nested for to solve the loop case 5.Be able to explain the break-continue feature in the for loop	Practical Test Form of Assessment: Practical Assessment	Approach: observing, asking, exploring. Method: lecture, discussion, question and answer, giving assignments Learning Strategy: accentuation of information processing (cognitive) 3 X 50	Repetition control References: Kuhlman, D. 2013 . A Python Book: Beginning Python, Advanced Python, and Python Exercises. M.I.T Material: Nested forwhile Bibliography: William F. Punch, Richard Enbody, 2018, Practice of Computing Using Python, The, Global Edition, Pearson Education	
4	Integrate while loop repetition program control to solve a case	1.Defines a while loop repetition to solve the repetition case 2.Create a program that contains a while loop to solve the repetition case 3.Defines a nested while loop 4.Create a program that contains a nested while loop to solve the repetition case 5.Be able to explain the break-continue feature in the while loop	Criteria: Practical Test Form of Assessment : Practical Assessment	Scientific Approach: observing, asking, exploring. Method: lecture, discussion, question and answer, giving assignments Learning Strategy: accentuation of information processing (cognitive) 3 X 50	Material: Repetition control References: Kuhlman, D. 2013 . A Python Book: Beginning Python, Advanced Python, and Python Exercises. M.I.T Material: Nested for- while Bibliography: William F. Punch, Richard Enbody, 2018, Practice of Computing Using Python, The, Global Edition, Pearson Education	2%
5	Use a string that suits the problem at hand	1.Defines a string constant 2.Using string constants 3.Defines a string variable 4.Using string variables 5.Defines standard string functions 6.Uses standard string functions	Criteria: Non-Test Form of Assessment : Participatory Activities	Scientific Approach: observing, asking, exploring. Methods: lecture, discussion, question and answer, giving assignments. Learning Strategy: accentuation of information processing (cognitive) 3 X 50	Material: String Library: Kuhlman, D. 2013 . A Python Book: Beginning Python, Advanced Python, and Python Exercises. M.I.T Material: String Data Type Operations Bibliography: William F. Punch, Richard Enbody, 2018, Practice of Computing Using Python, The, Global Edition, Pearson Education	2%

6	Explain, implement and process data collections in the form of simple text (text files) and handle exceptions	1.Create a program to open and close a file 2.Create a program to read and write data into a file 3.Handling exceptions in a program	Criteria: Non-Test Form of Assessment: Participatory Activities	Scientific Approach: observing, asking, exploring Methods: lecture, discussion, question and answer, practice, giving assignments. Learning Strategy: accentuation of information processing (cognitive) 3 X 50		Material: Library File Operations: Kuhlman, D. 2013. A Python Book: Beginning Python, Advanced Python, and Python Exercises. M.I.T Material: Write-Read Operation txt file Bibliography: William F. Punch, Richard Enbody, 2018, Practice of Computing Using Python, The, Global Edition, Pearson Education	2%
7	Use lists, tuples, sets, dictionaries that suit the problem at hand	1.Defines list, tuple, set, dictionary 2.Implement list, tuple, set, dictionary in loops 3.Using lists, tuples, sets, dictionaries according to the problem	Criteria: Non-Test Form of Assessment : Practical Assessment	Scientific Approach: observing, asking, exploring Methods: lecture, discussion, question and answer, practice, and giving assignments Learning Strategy: accentuation of information processing (cognitive) 3 X 50		Material: Bibliography : Swaroop, CH 2013. A Byte of Python. Packt Publishing Material: Set, Tuple, Dictionary Reference: Shaw, Z. 2014. Learn Python The Hard Way 3rd Edition. Addison- Wesley	2%
8	Midterm exam	Able to answer questions	Criteria: Practical Test Form of Assessment : Practical Assessment, Test	Practice Questions 2 X 50	Practice questions on LMS 2x50	Material: Fuction Operations Bibliography: William F. Punch, Richard Enbody, 2018, Practice of Computing Using Python, The, Global Edition, Pearson Education	20%

9	Use functions to group frequently used statements	1.Able to explain the concept of function in programming 2.Able to call functions in programming syntax 3.Able to explain parameters in functions 4.Able to explain the concept of returns in functions 5.Be able to explain the use of recursive functions	Criteria: Practical Test Form of Assessment : Practical Assessment	Scientific Approach: observing, asking, exploring Methods: lecture, discussion, question and answer, practice, giving assignments Learning Strategy: accentuation of information processing (cognitive) 3 X 50	Material: Function References: Kuhlman, D. 2013 . A Python Book: Beginning Python, Advanced Python, and Python Exercises. M.I.T Material: Fuction Operations Bibliography: William F. Punch, Richard Enbody, 2018, Practice of Computing Using Python, The, Global Edition, Pearson Education	4%
10	Describe and design classes and namespaces simply	1.Explain classes and objects 2.Declare a class 3.Declaring a variable in the form of an object 4.Using objects in programs 5.Explain the method 6.Declaring methods in a class 7.Using methods on objects	Criteria: Practical Test Form of Assessment: Practical Assessment	Scientific Approach: observing, asking, exploring Methods: lecture, discussion, question and answer, practice, giving assignments Learning Strategy: accentuation of information processing (cognitive) 3 X 50	Material: Class, Method, and Object Reference: Kuhlman, D. 2013 . A Python Book: Beginning Python, Advanced Python, and Python Exercises. M.I.T Material: Implementation of Class, Method, Object Library: William F. Punch, Richard Enbody, 2018, Practice of Computing Using Python, The, Global Edition, Pearson Education	3%
11	Explain and design complex features in classes	1.Explain the concept of abstraction 2.Explain the concept of encapsulation 3.Explain the concept of inheritance 4.Explain the concept of polymorphism 5.Explain the concept of aggregation	Criteria: Non-Test Form of Assessment: Participatory Activities	Scientific Approach: observing, asking, exploring Methods: lecture, discussion, question and answer, practice, giving assignments Learning Strategy: accentuation of information processing (cognitive) 3 X 50	Material: Class, object & method Reference: Kuhlman, D. 2013 . A Python Book: Beginning Python, Advanced Python, and Python Exercises. M.I.T Material: Implementation of Classes, Objects, and Methods References: William F. Punch, Richard Enbody, 2018, Practice of Computing Using Python, The, Global Edition, Pearson Education	2%

	T		T	Т	T		
12	Implementing a Graphical User Interface (GUI)	1.Able to explain GUI and its implementation 2.Able to implement classes and objects in the GUI 3.Able to apply functions in GUI	Criteria: Non-Test Form of Assessment: Participatory Activities	Scientific Approach: observing, asking, exploring Methods: lecture, discussion, question and answer, practice, giving assignments Learning Strategy: accentuation of information processing (cognitive) 3 X 50		Material: Class, object & method Reference: Kuhlman, D. 2013 . A Python Book: Beginning Python, Advanced Python, and Python Exercises. M.I.T Material: Implementation of Classes, Objects, and Methods References: William F. Punch, Richard Enbody, 2018, Practice of Computing Using Python, The, Global Edition, Pearson Education	2%
13	Implementing a Graphical User Interface (GUI)	1.Getting to know the python GUI 2.Create and program Python GUI components	Criteria: Practical Test Form of Assessment : Practical Assessment	Scientific Approach: observing, asking, exploring Methods: lecture, discussion, question and answer, practice, giving assignments Learning Strategy: accentuation of information processing (cognitive) 3 X 50		Material: GUI Reference: Kuhlman, D. 2013 . A Python Book: Beginning Python, Advanced Python, and Python Exercises. M.I.T Material: GUI Implementation References: William F. Punch, Richard Enbody, 2018, Practice of Computing Using Python, The, Global Edition, Pearson Education	5%
14	Design computer programs to solve problems related to data science.	1.Students are able to apply OOP concepts in GUI 2.Students are able to apply profiles and configurations.	Criteria: Progress report Form of Assessment : Project Results Assessment / Product Assessment	Learning is carried out offline with the PJBL stages as follows: Providing basic questions regarding the urgency of the problems raised in making the application Determining the boundaries of the problem in making the application Types of data abstraction and algorithms that will be used Agreeing on the implementation schedule in working on the 3 X 50 GUI application project		Material: All Chapters Bibliography: Kuhlman, D. 2013 . A Python Book: Beginning Python, Advanced Python, and Python Exercises. M.I.T	10%

15	Design computer programs to solve problems related to data science.	1.Students are able to apply OOP concepts in GUI 2.Students are able to apply profiles and configurations.	Criteria: Progress report Form of Assessment : Project Results Assessment / Product Assessment	Learning is carried out offline with the following PJBL stages: • Monitoring the student process in implementing and realizing the project through presentations of the progress of each group and facilitating students in discussions and questions and questions and answers regarding the development of the 3 X 50 GUI application	Material: All Chapters Bibliography: Kuhlman, D. 2013 . A Python Book: Beginning Python, Advanced Python, and Python Exercises. M.I.T	10%
16	Design computer programs to solve problems related to data science.	1.Students are able to apply OOP concepts in GUI 2.Students are able to apply profiles and configurations.	Criteria: Final Project Report Form of Assessment: Project Results Assessment / Product Assessment	Learning is carried out offline with the PJBL stages as follows: • Students present the progress of project implementation and realization and work on code modification tasks given directly 3 X 50	Material: All Chapters Bibliography: Kuhlman, D. 2013 . A Python Book: Beginning Python, Advanced Python, and Python Exercises. M.I.T	30%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	10%
2.	Project Results Assessment / Product Assessment	50%
3.	Practical Assessment	30%
4.	Test	10%
		100%

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.
- 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.
- 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.
- 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.