							Document Code

<table>
<tr><td rowspan="2">UNESA</td><td colspan="6" align="center">Universitas Negeri Surabaya
Faculty of Engineering,
Electrical Engineering Undergraduate Study Program</td><td>Document Code</td></tr>
</table>

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Basic Algorithms and Programming II	2020102397	Compulsory Study Program Subjects	T=2	P=0	ECTS=3.18	2	July 18, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
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Learning model	Case Studies

<table>
<tr><td rowspan="13">Program Learning Outcomes (PLO)</td><td colspan="2">PLO study program that is charged to the course</td></tr>
<tr><td colspan="2">Program Objectives (PO)</td></tr>
<tr><td>PO - 1</td><td>Students are able to apply algorithms and programming languages in solving problems based on engineering principles</td></tr>
<tr><td>PO - 2</td><td>Able to communicate effectively both verbally and in writing regarding basic topics of algorithms and programming 1.</td></tr>
<tr><td>PO - 3</td><td>Students are able to identify simple problems and formulate appropriate algorithms for solving problems</td></tr>
<tr><td>PO - 4</td><td>Students are able to formulate appropriate programming languages for solving problems</td></tr>
<tr><td colspan="2">PLO-PO Matrix</td></tr>
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P.O
PO-1
PO-2
PO-3
PO-4

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																

Short Course Description	The Basic Algorithms and Programming course is a course with a case study-based learning model which discusses the introduction and understanding of logic, algorithms, basic programming languages, program structure, data types, algorithm notation, control, repetition, functions, sequential processing, as well as practice problems. It's simple to be able to analyze a problem related to logic or ways of thinking which is then implemented in the Python programming language.

References	**Main :**

1. 1. Downey, Allen B. 2012. Think Python. O'Reilly Media, Inc., 1005 Gravenstein Highway North, Sebastopol, CA, United States
2. 2. Kulikov, Alexander S., and Pevzner, P. 2018. Learning Algorithms Through Programming and Puzzle Solving. United States of America: Active Learning Technologies.

Supporters:

Supporting lecturer	Miftahur Rohman, S.T., M.T. Pradini Puspitaningayu, S.T., M.T., Ph.D. Parama Diptya Widayaka, S.ST., M.T. Sayyidul Aulia Alamsyah, 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 analyze basic concepts of logic and algorithms, basic structures, characteristics of algorithms, and properties of algorithms	1. Accuracy in explaining logic, algorithm and programming concepts 2. Accuracy in explaining the role of logic and algorithms applied in programming languages to solve problems	**Criteria:** Assessment rubric **Form of Assessment** : Participatory Activities	Presentations, lectures and discussions 2 X 50	Presentations, lectures and discussions 2 X 50	**Material:** Basic logic and programming **References:** *1. Deitel, Paul, and Deitel, Harvey. 2012. C How to Program 7th Edition. United States of America: Pearson Education, Inc.*	0%
2	Students are able to implement notation for writing descriptive sentence algorithms, pseudocode, and flowcharts	1. Accuracy in explaining basic logic and algorithms 2. Accuracy in explaining the characteristics of the algorithm 3. Accuracy in explaining the nature of the algorithm 4. Accuracy in explaining algorithm notation	**Criteria:** The maximum score per item is 25 **Form of Assessment** : Participatory Activities	Presentations, lectures and discussions 2 X 50	Presentations, lectures and discussions 2 X 50	**Material:** Logic concepts, algorithm definitions, algorithm concepts, algorithm structures, properties and characteristics of algorithms **References:** *2. Kulikov, Alexander S., and Pevzner, P. 2018. Learning Algorithms Through Programming and Puzzle Solving. United States of America: Active Learning Technologies.*	0%
3	Students are able to describe the parts or structures contained in a C/C-based program	1. Accuracy in explaining the structure of a program 2. Accuracy in implementing the program structure	**Criteria:** Assessment rubric **Form of Assessment** : Participatory Activities	Presentations, lectures and discussions 2 X 50	Presentations, lectures and discussions 2 X 50	**Material:** C/C program structure **References:** *1. Deitel, Paul, and Deitel, Harvey. 2012. C How to Program 7th Edition. United States of America: Pearson Education, Inc.*	5%

4	Students are able to explain variables, data types, operators and identifiers in a C/C based program	1. Accuracy in explaining variable definitions, data types, operators and identifiers 2. Accuracy in indicating the use of variables, data types, operators, and identifiers 3. Accuracy in implementing variables, data types, operators and identifiers in a program	**Criteria:** The maximum score for each item is 25 if answered correctly **Form of Assessment** : Participatory Activities	Presentations, lectures and discussions 2 X 50	Presentations, lectures and discussions 2 X 50	**Material:** Variables, data types, operators, and identifiers **References:** *1. Deitel, Paul, and Deitel, Harvey. 2012. C How to Program 7th Edition. United States of America: Pearson Education, Inc.*	5%
5	Students are able to analyze the concept of branching structure in a C/C based (if - else) program	1. Accuracy in explaining the concept of branching using if-else 2. Accuracy in implementing branching structures using the if-else structure	**Criteria:** The maximum score for each item is 20 if answered correctly **Form of Assessment** : Participatory Activities	Presentations, lectures and discussions 2 X 50	Presentations, lectures and discussions 2 X 50	**Material:** If-else branching structure **References:** *1. Deitel, Paul, and Deitel, Harvey. 2012. C How to Program 7th Edition. United States of America: Pearson Education, Inc.*	5%
6	Students are able to explain functions, variables, data types, constants and operators used in a program	1. Accuracy in explaining the concept of switch-case branching 2. Accuracy in implementing branching structures using switch-case	**Criteria:** Assessment rubric **Form of Assessment** : Participatory Activities	Presentations, lectures and discussions 2 X 50	Presentations, lectures and discussions 2 X 50	**Material:** Switch-case branching structure **References:** *1. Deitel, Paul, and Deitel, Harvey. 2012. C How to Program 7th Edition. United States of America: Pearson Education, Inc.*	5%
7	Students are able to analyze the concept of loop structure in a C/C based program (for, while, do-while).	1. Accuracy in explaining the concept of for loop 2. Accuracy in implementing the for loop structure in programming	**Criteria:** Assessment rubric **Form of Assessment** : Participatory Activities	Presentations, lectures and discussions 2 X 50	Presentations, lectures and discussions 2 X 50	**Material:** The concept of loop structure for **References:** *1. Deitel, Paul, and Deitel, Harvey. 2012. C How to Program 7th Edition. United States of America: Pearson Education, Inc.*	5%
8	MIDDLE SEMESTER EXAMINATION / MID SEMESTER EXAMINATION	Accuracy in completing the questions provided in the time provided	**Criteria:** Each question item has an assessment weight adjusted to the student's ability to answer **Form of Assessment** : Test	MID SEMESTER EXAMINATION 2 X 50	MID SEMESTER EXAMINATION 2 X 50		20%

9	Students are able to explain the concept of branching and while and do-while loops in a program	1.Accuracy in explaining the concept of while and do while loops 2.Accuracy in implementing while and do-while loop structures in programming	**Criteria:** Assessment rubric **Form of Assessment** : Participatory Activities	Presentations, lectures and discussions 2 X 50	Presentations, lectures and discussions 2 X 50	**Material:** Concept of while and do-while loop structures **References:** *1. Deitel, Paul, and Deitel, Harvey. 2012. C How to Program 7th Edition. United States of America: Pearson Education, Inc.*	0%
10	Students are able to analyze the concept and structure of a function in a C/C based program	1.Accuracy in explaining the concept of using functions in a program 2.Accuracy in applying the use of functions in a program 3.Accuracy in explaining the concept of using functions with input, output and input-output parameters	**Criteria:** Assessment rubric **Form of Assessment** : Participatory Activities	Presentations, lectures and discussions 2 X 50	Presentations, lectures and discussions 2 X 50	**Material:** Function concepts, functions with return values, functions without return values, and functions with parameters. **References:** *1. Deitel, Paul, and Deitel, Harvey. 2012. C How to Program 7th Edition. United States of America: Pearson Education, Inc.*	0%
11	Students are able to analyze the concept and implementation of C/C-based array data type structures	1.Accuracy in explaining the concept of arrays 2.Accuracy in applying array data structures in a program	**Criteria:** Assessment rubric **Form of Assessment** : Participatory Activities	Presentations, lectures and discussions 2 X 50	Presentations, lectures and discussions 2 X 50	**Material:** Array concept **References:** *1. Deitel, Paul, and Deitel, Harvey. 2012. C How to Program 7th Edition. United States of America: Pearson Education, Inc.*	5%
12	Students are able to analyze the concept and implementation of array data type structures in C/C-based matrix operations	1.Accuracy in explaining the concept of arrays 2.Accuracy in applying array data structures in a program	**Criteria:** Assessment rubric **Form of Assessment** : Participatory Activities	Presentations, lectures and discussions 2 X 50	Presentations, lectures and discussions 2 X 50	**Material:** Array concept **References:** *1. Deitel, Paul, and Deitel, Harvey. 2012. C How to Program 7th Edition. United States of America: Pearson Education, Inc.*	5%
13	Students are able to analyze the concepts and implementation of Object Oriented Programming in C/C	1.Accuracy in explaining OOP concepts 2.Accuracy in implementing object-based programming (OOP) methods	**Criteria:** The maximum score for each item is 20 if answered correctly **Form of Assessment** : Participatory Activities	Presentations, lectures and discussions 2 X 50	Presentations, lectures and discussions 2 X 50	**Material:** Object Oriented Programming (OOP) **References:** *1. Deitel, Paul, and Deitel, Harvey. 2012. C How to Program 7th Edition. United States of America: Pearson Education, Inc.*	5%

No	Sub-PO	Indicators	Assessment	Form of Learning	Learning Methods	Learning Materials	Weight
14	Students are able to analyze the concepts and implementation of Object Oriented Programming in C/C	1.Accuracy in explaining OOP concepts 2.Accuracy in implementing object-based programming (OOP) methods	**Criteria:** The maximum score for each item is 20 if answered correctly **Form of Assessment** : Participatory Activities	Presentations, lectures and discussions 2 X 50	Presentations, lectures and discussions 2 X 50	**Material:** Object Oriented Programming (OOP) **References:** *1. Deitel, Paul, and Deitel, Harvey. 2012. C How to Program 7th Edition. United States of America: Pearson Education, Inc.*	5%
15	Students are able to analyze the concept and implementation of library use in a program	1.Accuracy in explaining the library concept in a program 2.Accuracy in compiling program libraries	**Criteria:** Assessment rubric **Form of Assessment** : Participatory Activities	Presentations, lectures and discussions 2 X 50	Presentations, lectures and discussions 2 X 50	**Material:** Object Oriented Programming **References:** *1. Deitel, Paul, and Deitel, Harvey. 2012. C How to Program 7th Edition. United States of America: Pearson Education, Inc.*	5%
16	FINAL SEMESTER EXAMINATION / FINAL SEMESTER EXAMINATION		**Form of Assessment** : Test	FINAL EXAMINATION OF SEMESTER 2 X 50		**Material:** Final Semester Exam **Literature:** *1. Deitel, Paul, and Deitel, Harvey. 2012. C How to Program 7th Edition. United States of America: Pearson Education, Inc.*	30%

Evaluation Percentage Recap: Case Study

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** 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.