	Universitas Negeri Surabaya Faculty of Engineering, Electrical Engineering Undergraduate Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Basic Algorithms and Programming Practicum II	2020101398		T=0	P=1	ECTS=1.59	3	July 18, 2024

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

Program Objectives (PO)

PO - 1	Students are able to apply algorithms and programming languages in solving problems based on engineering principles
PO - 2	Able to communicate effectively both verbally and in writing regarding basic topics of algorithms and programming 2.
PO - 3	Students are able to identify simple problems and formulate appropriate algorithms for solving problems
PO - 4	Students are able to formulate appropriate programming languages for solving problems

PLO-PO Matrix

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 project-based learning model that 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 questions. simple problems to be able to analyze problems related to logic or ways of thinking which are 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: Pradini Puspitaningayu, S.T., M.T., Ph.D.
Parama Diptya Widayaka, S.ST., 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, Practice/Performance	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	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	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	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	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	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	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	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	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	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	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%
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	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	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			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: Project Based Learning

No	Evaluation	Percentage
		0%

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.