



Universitas Negeri Surabaya
Faculty of Engineering
, Information Technology Education Undergraduate Study
Program

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight	SEMESTER	Compilation Date																																	
Data Structures	8320702122	Compulsory Study Program	T=2 P=0 ECTS=3.18	3	July 17, 2024																																	
AUTHORIZATION	SP Developer	Subjects	Course Cluster Coordinator	Study Program Coordinator																																		
	Drs. Bambang Sujatmiko, M.T.		Drs. Bambang Sujatmiko, M.T.																																		
Learning model	Case Studies																																					
Program Learning Outcomes (PLO)	PLO study program which is charged to the course																																					
	PLO-8	Mastering the concepts and implementation in developing software engineering, games, intelligent multimedia, and network computer engineering.																																				
	PLO-12	Able to implement science, technology, engineering, and mathematics (STEM) and informatics knowledge into research in education.																																				
	Program Objectives (PO)																																					
	PLO-PO Matrix																																					
		<table border="1" style="margin: auto;"> <tr> <td style="width: 20%;">P.O</td> <td style="width: 20%;">PLO-8</td> <td style="width: 20%;">PLO-12</td> <td colspan="3"></td> </tr> </table>					P.O	PLO-8	PLO-12																													
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PO Matrix at the end of each learning stage (Sub-PO)																																						
	<table border="1" style="margin: auto;"> <tr> <td rowspan="2" style="width: 5%;">P.O</td> <td colspan="16" style="text-align: center;">Week</td> </tr> <tr> <td style="width: 5%;">1</td> <td style="width: 5%;">2</td> <td style="width: 5%;">3</td> <td style="width: 5%;">4</td> <td style="width: 5%;">5</td> <td style="width: 5%;">6</td> <td style="width: 5%;">7</td> <td style="width: 5%;">8</td> <td style="width: 5%;">9</td> <td style="width: 5%;">10</td> <td style="width: 5%;">11</td> <td style="width: 5%;">12</td> <td style="width: 5%;">13</td> <td style="width: 5%;">14</td> <td style="width: 5%;">15</td> <td style="width: 5%;">16</td> </tr> </table>					P.O	Week																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
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Short Course Description	Advanced programming material such as pointers, structs, etc. Apart from that, there are also several data structures used in programming, both static and dynamic. And also algorithms in the sorting process and search process. Lectures contain theory, where programming assignments will be given.																																					
References	Main :																																					
	<ol style="list-style-type: none"> 1. Ekohariadi, Anita Qoiriah, Pemrograman Dasar Komputer, Unipress, , 2007 2. Malik, D.S., C++ Programming: From Problem Analysis to Program Design, Fifth Edition, Course Technology, Cengage Learning, 2011 3. Malik,D.S., Data Structures Using C++, Second Edition, Course Technology, Cengage Learning, 2010 4. Shaffer, Clifford A. A, Practical Introduction to Data Structures and Algorithm Analysis Edition 3.1 (C++ Version), Prentice Hall International Inc, 2011 5. Yatini B, Indra, Erliansyah Nasution, Algortima dan Struktur Data dengan C++, Graha Ilmu, 2005 6. Zakaria, Teddy Marcus, Agus Priyono. Konsep dan Implementasi Struktur Data, Informatika Bandung, 2006 																																					
	Supporters:																																					
Supporting lecturer	Anita Qoiriah, S.Kom., M.Kom. Dr. Yeni Anistyasari, S.Pd., M.Kom. Ronggo Alit, M.M., M.T. Bonda Sisephaputra, 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	Understand the linked-list data structure	Using data types (array, structure and class) in computer programs.		Data types · Array · Structure · Class 2			0%
2	Understand the linked-list data structure	Using the linked list data structure and its operations in computer programs.		· Lecture · Question and answer · Practicum 2 X 50			0%
3	Understand linked-list forms and their applications	Uses the double linked-list data structure and related operations. Uses circular linked-list data structure and related operations. Using a multi linked-list data structure and related operations		· Lecture · Question and answer · Discussion 2 X 50			0%
4	Understand the stack data structure and its application	1.Mention the characteristics of the stack data structure 2.Implement push operations on the stack in the program 3.Implementing the pop operation on the stack and how to declare it in the program		· Lecture · Question and answer · Practicum 2 X 50			0%
5	Understand the queue data structure and its application	1.Mention the characteristics of the queue data structure 2.Implement the add operation in the program 3.Implement delete operations on queues in the program		2 X 50			0%
6	Understand the tree data structure and its application	· Mention the characteristics of tree data structures · Mention the meaning of root, left child, right child, descendant, ancestor		2 X 50			0%

7	Understanding binary trees and traversal in binary trees	<ol style="list-style-type: none"> 1.Explain the meaning of a binary tree 2.Implement preorder traversal in the program 3.Implementing inorder traversal in the program 4.Implement postorder traversal in the program 		2 X 50			0%
8				2 X 50			0%
9	Understand algorithms and algorithm analysis	<ol style="list-style-type: none"> 1.Mention the meaning of algorithms 2.Explaining an algorithm about a mathematical topic 3.Analyzing the running time of an algorithm with certain complexity (N², Nlog N, N) 		2 X 50			0%
10	Understand searching algorithms	<ol style="list-style-type: none"> 1.Explain the searching algorithm 2.Create a searching algorithm (simple) 3.Analyzing searching algorithms 		2 X 50			0%
11	Understanding sorting algorithms (sorting)			2 X 50			0%
12	Understand NP complete problems	<ul style="list-style-type: none"> · Explain NP complete problems · Can distinguish between NP complete problems and non-NP complete problems · Explain and solve the knapsack problem · Explain and solve the shortest path problem · Explain and solve the Traveling salesman problem · Explain and solve the Hamiltonian Problem 		2 X 50			0%

13	Understand NP complete problems	· Explain NP complete problems · Can distinguish between NP complete problems and non-NP complete problems · Explain and solve the knapsack problem · Explain and solve the shortest path problem · Explain and solve the Traveling salesman problem · Explain and solve the Hamiltonian Problem		2 X 50			0%
14	Understand the application of searching, trees, sorting, and NP complete problems in life	Find ideas for applying tree theory, searching, sorting, NP complete problems in everyday life, and present them as final college assignments		2 X 50			0%
15							0%
16							0%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
		0%

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** 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.
- 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.
- 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.
- Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
- 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%.
- TM=Face to face, PT=Structured assignments, BM=Independent study.

