



Module Handbook

Module Name :	<i>Struktur Data dan Algoritma</i> Data Structures and Algorithms
Module level :	Bachelor degree/Undergraduate Program
Course Code :	4420103132
Abbreviation, if applicable:	-
Courses included in the module, if applicable:	Not Applicable
Semester/Term	4 th / Second year
Module coordinator(s)	Dr. Elly Matul Imah, M.Kom.
Lecturer(s):	Dr. Elly Matul Imah, M.Kom.
Language:	Bahasa Indonesia (Indonesian Language)
Classification within the curriculum:	Compulsory/ Elective
Teaching format/class hours per week during the semester:	3 contact hours of lectures (<i>sks</i> or credit unit*)
Workload :	3 x 50 minutes lectures, 3 x 60 minutes structured activity, and 3 x 60 minutes individual activity per week, 14 weeks per semester 119 total hours per semester ~ 4.76 ECTS**
Credit Unit:	3 credit unit (4.76 ECTS)
Requirements:	Discrete mathematics, Programming language



<p>Learning goals/competencies:</p>	<p>Knowledge (KNO-1: Demonstrating mathematical knowledge and mathematical insight)</p> <p>CLO-1: Able to demonstrate mathematical concepts in explaining data types and data structures such as linked-list, stack, queue, and tree in a program</p> <p>CLO-2: Able to demonstrate mathematical concepts in explaining simple algorithms such as searching algorithm, sorting algorithm and NP Complete problem</p> <p>Skill (SKI-3: Analyzing the formal structure of mathematical problems and relevant fields)</p> <p>CLO-3: Able to analyze simple algorithms such as searching algorithm, sorting algorithm and NP Complete problem in a program</p> <p>Skill (SKI-4: Implementing simple mathematical procedures in computer programs.)</p> <p>CLO-4: Able to implement data types and data structures such as linked-list, stack, queue, and tree in a program</p> <p>CLO-5: Able to implement simple algorithms such as searching algorithm, sorting algorithm and NP Complete in a program</p> <p>Competence (COM-2: Generating ideas used for completing mathematical tasks and to communicate them either in writing or orally, in accordance with scientific principles)</p> <p>CLO-6: Find ideas application of tree theory, searching, sorting, NP complete problem in everyday life</p> <p>Competence (COM-3: Solving mathematical problems using technology)</p> <p>CLO-7: Able to create a program from the idea that proposed as applied from simple algorithm such as searching, tree, sorting, and NP complete problems in life</p> <p>Social (SOC-1: Working collaboratively and having social sensitivity (obligations as citizens and towards religion) and</p>
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	<p>being able to bring change to a techno-ecopreneurship community.)</p> <p>1. CLO-8: Able to work in a team to solve a problem using data structure and simple algorithm</p>
Content	<p>This course is primarily aimed at teaching the concepts of data structures and algoritms that can be applied to computer programs. Basic data structures such as linked-list, stack, queue, and tree and simple algorithms including searching algorithms and sorting algorithms. Lecture activities are carried out in a student center with discussions, observations, project assignments, and presentations.</p>

Attribute Soft skill:	Active communication; Discipline; Collaboration; Responsibility; and Argumentation in class										
Study/exam achievements:	The final grade (<i>NA</i>) is calculated based on the following ratio:										
	<table border="1"> <thead> <tr> <th>Assessment Components</th> <th>Percentage of contribution</th> </tr> </thead> <tbody> <tr> <td>Participation</td> <td>20%</td> </tr> <tr> <td>Assignment</td> <td>30%</td> </tr> <tr> <td>Mid-semester test</td> <td>20%</td> </tr> <tr> <td>Final semester test</td> <td>30%</td> </tr> </tbody> </table>	Assessment Components	Percentage of contribution	Participation	20%	Assignment	30%	Mid-semester test	20%	Final semester test	30%
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	<p>Grade conversion of 0-100 scale into 0-4 scale is set as below:</p> <table border="1"> <thead> <tr> <th>Letter</th> <th>Number</th> <th>Grade Interval</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>4,00</td> <td>$85 \leq A \leq 100$</td> </tr> <tr> <td>A-</td> <td>3,75</td> <td>$80 \leq A- < 85$</td> </tr> <tr> <td>B+</td> <td>3,50</td> <td>$75 \leq B+ < 80$</td> </tr> <tr> <td>B</td> <td>3,00</td> <td>$70 \leq B < 75$</td> </tr> <tr> <td>B-</td> <td>2,75</td> <td>$65 \leq B- < 70$</td> </tr> <tr> <td>C+</td> <td>2,50</td> <td>$60 \leq C+ < 65$</td> </tr> <tr> <td>C</td> <td>2,00</td> <td>$55 \leq C < 60$</td> </tr> <tr> <td>D</td> <td>1,00</td> <td>$40 \leq D < 55$</td> </tr> <tr> <td>E</td> <td>0,00</td> <td>$0 \leq E < 40$</td> </tr> </tbody> </table>	Letter	Number	Grade Interval	A	4,00	$85 \leq A \leq 100$	A-	3,75	$80 \leq A- < 85$	B+	3,50	$75 \leq B+ < 80$	B	3,00	$70 \leq B < 75$	B-	2,75	$65 \leq B- < 70$	C+	2,50	$60 \leq C+ < 65$	C	2,00	$55 \leq C < 60$	D	1,00	$40 \leq D < 55$	E	0,00	$0 \leq E < 40$
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Learning Methods :	<p>Student-centered approach; project-based learning; lecturer and discussion; and presentations (structured activities). Skills or competence learning outcomes can be achieved by practicum activity.</p>																														
Form of Media:	Power point slides; video; worksheets and textbooks																														
Literature (primary references):	<ol style="list-style-type: none"> Weiss, M. A. 2012. Data Structures & Algorithm Analysis in Java , 3rd Ed, Addison Wesley Cormen, T. H., C. E. Leiserson and R. L. Rives. 2009. Introduction to Algorithms, 3rd Ed. Cambridge: MIT Pres Weiss, Mark Allen. Data Structures and Problem Solving using Java 4th Edition. Pearson Education, Inc., 2010. Liang, Y Daniel. Introduction to Java Programming and Data Structures 11th Edition. Pearson Education, Inc., 2018. 																														
Notes:	<p>*1 credit unit or <i>sks</i> in learning process = three periods consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</p>																														



MINISTRY OF EDUCATION, CULTURE, RESEARCH, AND TECHNOLOGY

UNIVERSITAS NEGERI SURABAYA

FACULTY OF MATHEMATICS AND NATURAL SCIENCE

UNDERGRADUATE PROGRAM OF MATHEMATICS

Ketintang Campus, C8-C9 Buildings of FMIPA, Surabaya

Email: s1-mat@unesa.ac.id

<p>**1 credit unit or <i>sks</i> = 1.59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/UN38/HK/AK/2019</p>
