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 Faculty of Mathematics and Natural Sciences
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MODULE HANDBOOK

Module designation	<i>Data Structure</i>
Semester(s) in which the module is taught	3
Person responsible for the module	<i>Dra. Bevina D. Handari, M.Sc., Ph.D.</i>
Language	<i>Indonesian</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Flipped learning and Project-Based Learning</i>
Workload (incl. contact hours, self-study hours)	<i>(Estimated) Asynchronous Forum Discussion in EMAS 1 x 60 minutes (with teacher) + 1 x 60 minutes (between students). Contact hours: Flipped Learning 1 x 50 minutes, Lecture 1 x 50 minutes. Private study including examination preparation, specified in hours¹: 1-hour structured activities and 1-hour individual study per week.</i>
Credit points	3 SKS (4.77 ECTS)
Required and recommended prerequisites for joining the module	<i>Elementary Linear Algebra, Algorithm and Programming</i>
Module objectives/intended learning outcomes	<i>By following this course, students will be able to design and use appropriate data structure and efficient in structured, modular and object-oriented programming for solving a problem with computer assistance. Furthermore, students can design efficient and effective data management integrated using standard and up-to-date tools. The language used in this lesson is Indonesian.</i>

¹ When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<p>Content</p>	<ol style="list-style-type: none"> 1. <i>Algorithm Data Structure Review</i> 2. <i>Algorithm Complexity Review</i> 3. <i>Static Memory Allocation:</i> <ol style="list-style-type: none"> a) <i>One-Dimensional Array</i> b) <i>Two-Dimensional Array</i> c) <i>Array of Function Parameters</i> d) <i>Array Manipulation</i> e) <i>Searching</i> f) <i>Sorting</i> 4. <i>Dynamic Memory Allocation:</i> <ol style="list-style-type: none"> a) <i>Linked List</i> b) <i>Single Linked List</i> c) <i>Doubly Linked List</i> d) <i>Searching in Linked List</i> e) <i>Inserting into a Linked List</i> f) <i>Deleting From a Linked List</i> 5. <i>Basic Data Structure:</i> <ol style="list-style-type: none"> a) <i>Stack</i> b) <i>Queue</i> 6. <i>Hierarchical Data Structure:</i> <ul style="list-style-type: none"> <i>Tree</i> <i>Binary Tree</i> <i>B-Tree</i> <i>Heap Tree</i> <i>Balance Tree</i>
<p>Examination forms</p>	<ol style="list-style-type: none"> 1. <i>Class activities: Homework, small projects</i> 2. <i>Mid-term examination</i> 3. <i>Final examination (presentation)</i>

<p>Study and examination requirements</p>	<p><i>The final mark will be weighted as follows:</i></p> <ol style="list-style-type: none"> 1. <i>Homework (20%)</i> 2. <i>Mid-term examination (30%)</i> 3. <i>Small Projects (20%)</i> 4. <i>Final examinations (30%)</i> <p><i>To successfully pass the module it requires minimum 55% of the total mark.</i></p> <table border="0"> <thead> <tr> <th style="text-align: left;"><i>Mark</i></th> <th style="text-align: left;"><i>Grade</i></th> </tr> </thead> <tbody> <tr> <td>85–100</td> <td>A</td> </tr> <tr> <td>80–<85</td> <td>A-</td> </tr> <tr> <td>75–<80</td> <td>B+</td> </tr> <tr> <td>70–<75</td> <td>B</td> </tr> <tr> <td>65–<70</td> <td>B-</td> </tr> <tr> <td>60–<65</td> <td>C+</td> </tr> <tr> <td>55–<60</td> <td>C</td> </tr> <tr> <td>40–<55</td> <td>D</td> </tr> <tr> <td><40</td> <td>E</td> </tr> </tbody> </table>	<i>Mark</i>	<i>Grade</i>	85–100	A	80–<85	A-	75–<80	B+	70–<75	B	65–<70	B-	60–<65	C+	55–<60	C	40–<55	D	<40	E
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<p>Reading list (resources)</p>	<ol style="list-style-type: none"> 1. <i>Brookshear, J.G., Computer Science An Overview, 9th Edition, Pearson International Edition, 2007.</i> 2. <i>Mehta, D.P., Sahni, S., Handbook of Data Structures and Applications, 2nd Ed, Chapman & Hill/ICR Computer & Information Science Series, 2018</i> 3. <i>Bhasin. H., Algorithm Design and Analysis, Oxford University Press, 2015</i> 																				