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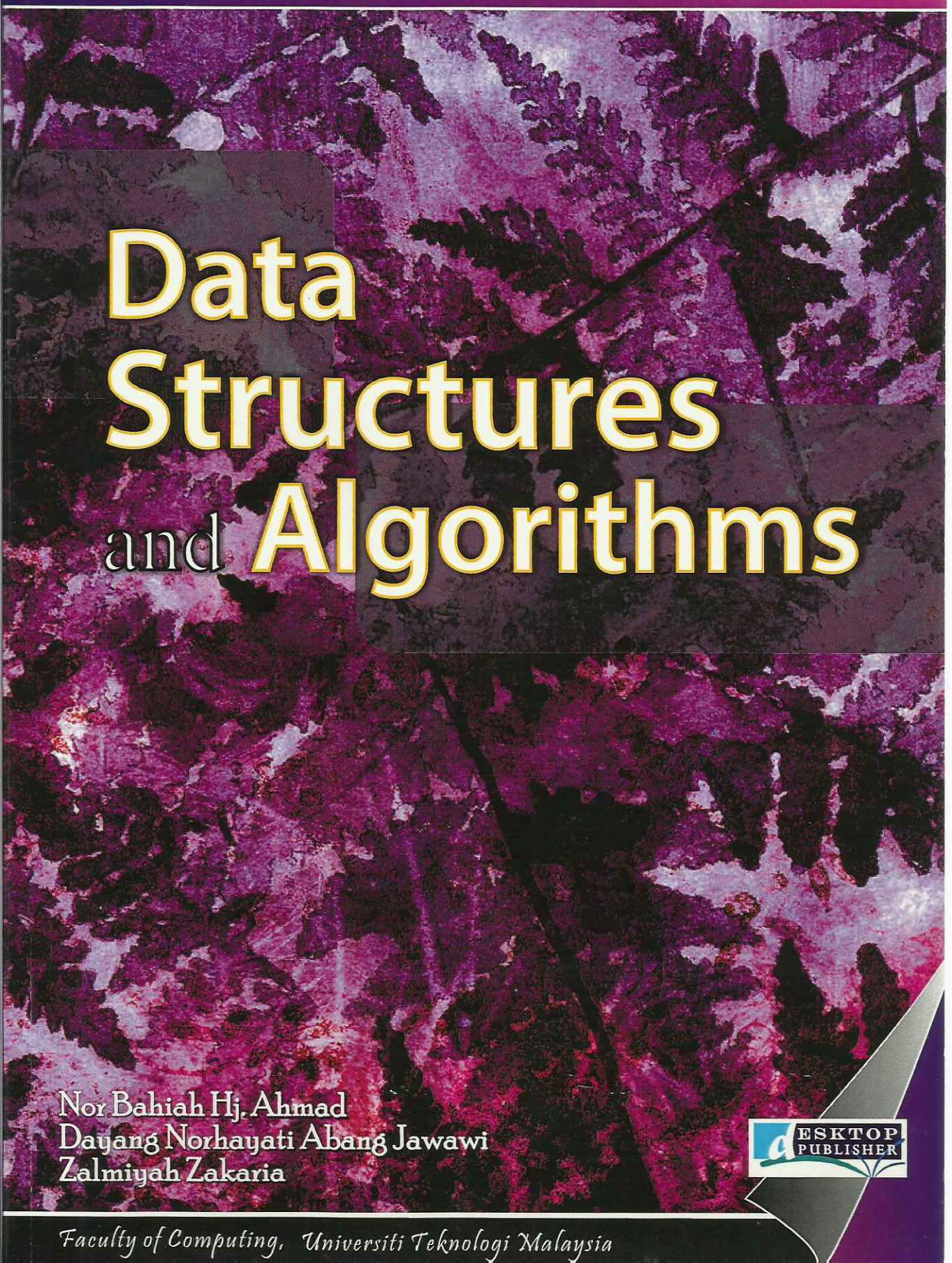

Data Structures and Algorithms

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DATA STRUCTURES AND ALGORITHMS

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Disclaimer

This workbook and its contents are intended solely for the use of Data Structures and Algorithms course to be taught at Faculty of Computing, Universiti Teknologi Malaysia, Skudai. The algorithms and programs in this module have been included for their instructional value. They have been tested but are not guaranteed for any particular purpose. The authors do not offer any warranties or representations nor do they accept any liabilities with respect to their use. The authors reserve the right to revise this publication and make changes from time to time in its content without notice.

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PREFACE

OBJECTIVE

The teaching module for Data Structures and Algorithms is intended to be used as teaching and learning reference as a practical problem-solving class activity.

LEARNING OUTCOMES

By the end of the course, students should be able to:

No.	Course Learning Outcome	Programme Learning Outcome(s) Addressed	Assessment Methods
1.	Describe all types of data structures and know how to apply them effectively in problem solving.	PO1	LE, Q, T, F
2.	Analyze and select the most suitable and effective algorithm for solving certain problem and case study.	PO2	LE, Q, A, T, PR, F, LT
3.	Develop a medium to complex program as a group mini project by applying data structure concept and present the output in the class.	PO2, PO6	PR, A, Pr, Peer

Remarks :

PO1 – Knowledge Understanding (Ability to acquire and apply theory and principles of CS)
PO2 – Technical (Ability to design and construct computer program using standard approaches)
PO6 – Team Working (ability to work effectively in a team)

T – Test, Q – Quiz, LE – Lab exercise, A – Assignment, Peer – Peer assessment, PR – Project , Pr – Presentation, F – Final Exam, LT- Lab Test

CONTENT OF THE MODULE

The module consists of three parts: Key concepts, Programming Exercise and Exercise. The objective of Key Concepts material is to be used for class lecture session. The content of the material is in the form of short notes that explain the main concepts of data structure. Programming exercises provide problem solving activities whereby the students apply the data structure concepts effectively in solving problem in C++. Exercises contains various type of questions in order to asses the students knowledge on data structure concepts theoretically and practically. The learning outcomes or objectives for each module are stated at the beginning of every module. Mini project and assignments in this course are to expand and evaluate problem

solving skills of the students. The specification of the assignment and mini project is included in the Appendix of this module.

The data structure concepts included in this module are: Introduction To Data Structure, Abstract Data Type and Class, Recursive, Algorithm Efficiency, Sorting Techniques, Searching, Link List, Stack, Queue, and Tree.

ASSESSMENT

No.	Assessment	Number and Topics	% each	% total	Theory	Practical
1	Assignments (group project 2 students)	**2** 1. C++, Sorting and Searching 2. Linked List	4%	8	-	Practical (8%)
2	Quizzes	**2-4** **1.** C++ **2.** Recursive **3.** Algo Efficiency **4.** Sorting **5.** Linked List **6.** Stack **7.** Queue **8.** Tree	5%	10	Theory (5%)	Practical (5%) C++/ Recursive
3	Lab Exercises (individual)	**4** 1. C++ 2. Sorting 3. Linked List 4. Stack/Queue	2.5%	10		Practical (10%)
4	Project (group work)	**1** (Cover everything and include either stack/queue/tree)	9%	9		Practical (9%)
	Peer Review	**3**	1%	3		Practical (3%)
5	Test 1	(Topics in Week1,ADT-Week5(Sorting))	20%	20	Theory (20%)	
6	Final Exam	(Topics in Week6-Week14)	40%	20	Theory (20%)	
7	Test 2 (Lab Test)			20		Practical (20%)
	Overall Total			**100**	**45%**	**55%**

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