Course & Code : Fundamental of Data Structure (CSC 248)
Program & Code : Diploma in Computer Science (CS110)
Course Status : Core
Pre-Requisite : Object Oriented Programming / CSC238
Credit : 3
Contact Hour : 5
Lecturer : Zanariah Idrus

Course Outcome : Upon completion of this course, students should be able to:

1. Explain the concept of primitive and abstract data type (ADT) data specification and abstraction
2. Implement and apply the fundamental data structures using primitive and Abstract Data Types (ADTs)
3. Implement and apply the general data structures: Sequential List and Linked list
4. Use the specific data structures: Stack and Queue
5. Implement and apply various types of tree operations.

Course Description : In this course, we attempt to understand the concept of information organization and manipulation in a computer to emphasize the use of data structure in problem solving. An object-oriented approach will be taught to develop the programming solutions.

Compiler : Java

Evaluation : Continuous Assessment

- Test 1 – 10%
  - WEEK 7 - 20 APR 2018
- Test 2 – 10%
  - WEEK 14 - 11 JUN 2018
- Assignments/Lab Test - 10%
- Quizzes – 10%
- Project – -10%
- Final – 50%

Textbook : To be announced
### Scheme of Work

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture Hours</th>
<th>Lab Hours</th>
<th>Blended Learning</th>
<th>Topic</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>1</td>
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<td><strong>Topic 1: Introduction to Data Structure</strong> &lt;br&gt; - Abstract Data Type Concept &lt;br&gt; - Data Structure Concept &lt;br&gt; - Application of Data Structures &lt;br&gt; - Implementation of Generic classes</td>
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<td><strong>Topic 2: Sequential List</strong> &lt;br&gt; - Basic Sequential List Concept</td>
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<td>2-3</td>
<td>5</td>
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<td><strong>Topic 2: Sequential List</strong> &lt;br&gt; - Implementation of Sequential List &lt;br&gt; - Application of Sequential List</td>
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<td>4</td>
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<td>1</td>
<td><strong>Topic 3: Linked List</strong> &lt;br&gt; - Basic Linked List concept &lt;br&gt; - Concept in variation of linked list: double linked list and circular linked list</td>
<td><strong>Week 4 Quiz 1 Array List</strong></td>
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<tr>
<td>4-6</td>
<td>4</td>
<td>3</td>
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<td><strong>Topic 3: Linked List</strong> &lt;br&gt; - Implementation of Linked List &lt;br&gt; - Application of Linked List</td>
<td><strong>Week 5 Assignment1: ArrayList</strong></td>
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<td><strong>MID SEMESTER BREAK</strong>&lt;br&gt;25 MAY 2018 – 2 JUNE 2018</td>
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<td><strong>Topic 4: Queue</strong> &lt;br&gt; - Basic Queue concept</td>
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<td>7-8</td>
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<td>4</td>
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<td><strong>Topic 4: Queue</strong> &lt;br&gt; - Queue implementation and application</td>
<td><strong>Week 8 Linked list</strong></td>
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<td><strong>Topic 5: Stack</strong> &lt;br&gt; - Basic Stack concept</td>
<td><strong>Week 8 Test1 : Topic 1,2,3,4</strong></td>
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<td><strong>Topic 5: Stack</strong> &lt;br&gt; - Stack implementation and application</td>
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<td>1</td>
<td><strong>Topic 5: Stack</strong> &lt;br&gt; - Arithmetic Expression (Infix, Postfix and Prefix) in stack application</td>
<td><strong>Assignment2:</strong></td>
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<td>1</td>
<td>1</td>
<td><strong>Topic 6: Tree</strong> &lt;br&gt; - Concept of Recursion and Recursive Functions</td>
<td><strong>Week 11 Stack &amp; Queue</strong></td>
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<td>11-12</td>
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<td>1</td>
<td><strong>Topic 6: Tree</strong> &lt;br&gt; - Basic Tree Concept &lt;br&gt; - Type of tree: Complete Binary Tree, Almost Complete Binary Tree, Strictly Binary Tree &lt;br&gt; - Expression Tree</td>
<td><strong>Week 12 Project Binary Search Tree</strong></td>
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<td>12-13</td>
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<td><strong>Topic 6: Tree</strong> &lt;br&gt; - Binary Search Tree (BST) Concept</td>
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### Project Submission (W14)
10\(^{th}\) – 14\(^{th}\) JUNE 2018

### OTHER REFERENCES