CS2468: DATA STRUCTURES AND DATA MANAGEMENT

Effective Term
Semester A 2023/24

Part I Course Overview

Course Title
Data Structures and Data Management

Subject Code
CS - Computer Science

Course Number
2468

Academic Unit
Computer Science (CS)

College/School
College of Engineering (EG)

Course Duration
One Semester

Credit Units
3

Level
B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
CS2360 Java Programming or equivalent

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil
Part II Course Details

Abstract
Data structures are essential in computer science. This course aims to develop an understanding of the concepts and techniques of fundamental data structures, data management and simple file systems.

Course Intended Learning Outcomes (CILOs)

<table>
<thead>
<tr>
<th>CILOs</th>
<th>Weighting (if app.)</th>
<th>DEC-A1</th>
<th>DEC-A2</th>
<th>DEC-A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe the functionality of a data structure as an abstract data type.</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Implement an abstract data type in a programming language.</td>
<td></td>
<td>x</td>
<td></td>
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<tr>
<td>3. Implement and test data structures for common structures; select an appropriate data structure from a given set of structures to solve a given problem.</td>
<td></td>
<td>x</td>
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<tr>
<td>4. Develop the attitude to propose solutions through independent investigation.</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
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<tr>
<td>5. Develop the ability to design, implement, and apply data structures and data storage management to simple real life problems.</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
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</tbody>
</table>

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Teaching and Learning Activities (TLAs)

<table>
<thead>
<tr>
<th>TLAs</th>
<th>Brief Description</th>
<th>CILO No.</th>
<th>Hours/week (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lecture</td>
<td>Explain concepts, different kind of data structures, algorithms for data structures</td>
<td>1, 2, 3, 4, 5</td>
<td>3 hours per week</td>
</tr>
<tr>
<td>2. Tutorials</td>
<td>Do exercises about concepts, data structure algorithms and programming</td>
<td>1, 2, 3, 4, 5</td>
<td>8 hours per semester</td>
</tr>
</tbody>
</table>
### Assessment Tasks / Activities (ATs)

<table>
<thead>
<tr>
<th>ATs</th>
<th>CILO No.</th>
<th>Weighting (%)</th>
<th>Remarks (e.g. Parameter for GenAI use)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>1, 2, 3, 4, 5</td>
<td>8</td>
<td>2 assignments will be given.</td>
</tr>
<tr>
<td>Exercises (in-lecture and in-tutorial)</td>
<td>1, 2, 3, 4, 5</td>
<td>10</td>
<td>10 in-lectures exercises will be given in 10 weeks. 10 in-tutorial exercises will be given in 10 weeks.</td>
</tr>
<tr>
<td>Pre-mid-term test</td>
<td>1, 2, 3, 4, 5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Midterm</td>
<td>1, 2, 3, 4, 5</td>
<td>8</td>
<td></td>
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</tbody>
</table>

### Continuous Assessment (%)

30

### Examination (%)

70

### Examination Duration (Hours)

2

### Additional Information for ATs

For a student to pass the course, at least 30% of the maximum mark for the examination must be obtained.

### Assessment Rubrics (AR)

**Assessment Task**

Exercises (in-lecture and in-tutorial)

**Criterion**

Perfect answers full mark. 50% for in-perfect answers.
Assessment Task
Assignments
Criterion
Question has a score
Excellent (A+, A, A-)
High
Good (B+, B, B-)
Significant
Fair (C+, C, C-)
Moderate
Marginal (D)
Basic
Failure (F)
Not even reaching marginal levels

Assessment Task
Pre-mid-term test
Criterion
Question has a score
Excellent (A+, A, A-)
High
Good (B+, B, B-)
Significant
Fair (C+, C, C-)
Moderate
Marginal (D)
Basic
Failure (F)
Not even reaching marginal levels

Assessment Task
Midterm
Criterion
Question has a score
Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

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**Assessment Task**
Final exam

**Criterion**
Question has a score

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

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**Part III Other Information**

**Keyword Syllabus**
Abstract data types, data structures, linked lists, stacks, queues, binary trees, multiway trees, Btrees, sorting, searching, file processing, physical characteristics of data storage devices, access and retrieval times, updating files.

**Reading List**

**Compulsory Readings**

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<tr>
<th>Title</th>
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### Additional Readings

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<th></th>
<th>Title</th>
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