Complex Computing Problem

(SESC-344) Software Construction & Development

**BSSE-V**

**(15 Marks)**

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| --- | --- | --- | --- | --- |
| **CLO** | **Description** | **Blooms**  **Taxonomy**  **level** | **PLOs** | **Assessment** |
| 1 | ***Develop*** Object-oriented design models and refine them to reflect implementation details | C6 | 4 | Source code Report  Viva |

**Objective**:

The aim of the complex engineering problem is to enable students to develop a software system for a real-world problem using software construction fundamentals.

**Problem Statement**

Design and implement a software system using software construction fundamentals. The main tasks for the given CEP are:

1. Identification of a real-world problem. (2 Marks)
2. Designing detailed solution using UML notations (4 Marks)
3. Development of software application following good coding practices (4 Marks)
4. Pushing your code on a GitHub after creation of a repository. (2 Marks)
5. Writing unit test for at least two functionalities to ensure correctness (2 Marks)
6. Implementation of Exception Handling (1 Mark)

**General Implementation Requirements**

* Follow coding standards and naming conventions.
* Implement proper Exception Handling.
* Marks will be allocated to proper documentation and coding standards.
* Make sure you test your program with this setting before your final submission.
* Make a comprehensive report describing the detail of project.

Make a group of 4-5 individuals. Each group will be assessed at the end of the semester through a comprehensive report along with project demonstration.

**Equipment:**

Visio/Draw.io + Eclipse/Netbeans

**Submission deadline:**

* Report + Presentation Submission: **21 December 2023**
* Viva + Software demonstration/Presentation: **21 December 2023**

**Complex Computing Problem Attributes involved:**

|  |  |  |
| --- | --- | --- |
| **Tasks** | **CCP Attributes Mapping** | **Justification** |
| Identification of a real-world problem. | ***Requirement Identification*** | A good understanding is needed to capture requirements regarding proposed system. |
| Designing detailed solution using UML notations | ***Depth of analysis***  ***required*** | It requires conceptual thinking and innovative analysis to formulate suitable abstract models |
| Development of software application following good coding | ***Depth of knowledge***  ***Required***  ***Familiarity of issues*** | A detail knowledge is required regarding the implementation using software construction fundamentals and solving encountered issues. |
| Pushing your code on a GitHub after creation of a repository. | ***Depth of knowledge***  ***Required*** | A detail knowledge is required regarding version controlling software |
| Writing unit test for at least two functionalities to ensure correctness | ***Depth of knowledge***  ***Required*** | A detail knowledge is required regarding Test Driven Development |
| Implementation of Exception Handling | ***Depth of knowledge***  ***Required*** | A detail knowledge is required regarding the Exception Handling. |

**Deliverables:**

1. Software demonstration of the complete project

2. Project report

The project report must include the following sections:

* Objective
* Introduction
* Detail Design

1. Package diagram
2. Object diagram
3. Sequence diagrams
4. Communication diagrams

* Implementation
* Test Report
* Conclusion