**UNIVERSITY OF GUYANA**

**FACULTY OF NATURAL SCIENCES**

**DEPARTMENT OF COMPUTER SCIENCE**

**Course Number:** CSE 3203

**Course Name:** Object Oriented Software Analysis, Design and Development

**Course Credit:** 4

**Description:** This course is a third year second semester elective course intended for students pursuing the four year full time BSc Computer Science program. The course will focus on the object-oriented approach for analysis and design. Students will gain an appreciation of the difference between writing programs and doing analysis and design. Problem formulation and decomposition (analysis) and solution building (design) will be covered. Students will work in small groups, each group having the responsibility for analysis, design and implementation of a software system. Case tools will be used in several stages of the development process.

**Exemption(s):** There are no exemptions for this course.

**Pre-requisites:** CSC 2200 – Contemporary Programming Paradigms

**Follow-On Courses:**

**Learning Outcomes:**

By the end of this course students will be able to:

1. Identify and Describe object-oriented concepts
2. Identify and Describe formal object-oriented analysis and design processes
3. determine which processes and OOAD techniques should be applied to a given project
4. Use UML and CASE tools to conduct Object Oriented Analysis and Design
5. Analyze, Design and Develop (Implement) an Object-oriented software

**Course Content:**

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| --- | --- | --- | --- |
| **WEEK** | **TOPICS** | **Lecture HOURS** | **Lab HOURS** |
| 1 | Principles of Object Orientation  Object-Oriented Concepts and Terminologies  Labs | 3 | 2 |
| 2 | Modelling and Software Development Process  Object-Oriented Software Development Process  Object-Oriented Software Development Activities: Requirements Gathering, Requirements  Analysis, Architecture, Design, Implementation, Testing & Deployment  Labs | 3 | 2 |
| 3 | Object-Oriented Analysis  Principles of Modelling with UML  Requirements Analysis: Eliciting and Documenting Requirements  Functional and Non-functional Requirements  Use Cases, Use Case Descriptions, & Use Case Diagrams  Labs | 3 | 2 |
| 4 | Object-Oriented Analysis  Requirements Analysis: Eliciting and Documenting Requirements  Use Cases, Use Case Descriptions, & Use Case Diagrams | 3 | 2 |
| 5 | Requirements Analysis: Eliciting and Documenting Requirements  Activity Diagrams: Essential elements; Use Case flow of events  Assignment #1  Labs | 3 | 2 |
| 6 | Object-Oriented Analysis  Key Abstractions: CRC Models; CRC Analysis  Test #1  Labs | 2 | 1  2 |
| 7 | Object-Oriented Analysis and Design  UML Class Diagrams  UML Object Diagrams  Domain Model Class Diagrams  Labs | 3 | 2 |
| 8 | Object-Oriented Analysis to Design: Interaction Diagrams  Elements of the Design Model  Interaction and Collaboration: Collaboration Diagrams; Sequence Diagrams; State Diagrams  Assignment #2 (Project)  Labs | 3 | 2 |
| 9 | Object-Oriented Analysis to Design: Interaction Diagrams  Elements of the Design Model  Interaction and Collaboration: Collaboration Diagrams; Sequence Diagrams; State Diagrams  Activity Diagrams  Collaboration Diagrams  Labs | 3 | 2 |
| 10 | Object-Oriented Analysis to Design: Interaction Diagrams  Activity Diagrams  Collaboration Diagrams  Model Object State: UML State Machine Diagrams  Refined Class Design Model  Test #2  Labs | 2 | 1  2 |
| 11 | Design Patterns to Design Model  Elements of Software Pattern  Examples of Software Patterns:  Labs | 3 | 2 |
| 12 | Architectural Concepts and Diagrams  Distinguish between architecture and design  Tiers, Layers, System qualities  Architecture workflow  Diagram of key architecture views  Architecture type and architecture workflow artifacts  Labs | 3 | 2 |
| 13 | Overview of Frameworks  Definition, advantages/disadvantages of using frameworks, identification of common frameworks, creating business domain frameworks | 3 | 2 |
| 14 | Revision |  |  |
| 15 | Final Examination |  |  |
| Total | 65 Hours of Contact | 39 | 26 |

**Method of Teaching:**

Lectures + Tests 3 x 13 = 39 hrs.

Laboratories/ Tutorials 2 x 13 = 26 hrs.

**Method of Assessment:**

**Coursework (40%)**

Tests (20%)

Assignments (20%)

**Final Examination (60%)**

**Required Reading(s)**

Larman, C. (2005) *Applying UML and patterns: an introduction to object-oriented analysis and design and iterative development*. Pearson Education India.

Booch, G. (2007) *Object-Oriented Analysis and Design with Applications*. 3rd ed.

**Recommended Reading(s)**

Booch, G. (2006) *Object oriented analysis & design with application*. Pearson Education India.