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**Department of Computer Science and Engineering**

**University of Dhaka**

**Course Outline**

CSE2102 - Object Oriented Programming

1. **General Information**

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| **Course Title:** | CSE2102 - Object Oriented Programming |
| **Credit:** | 3.00 |
| **Semester:** | September, 2024 |
| **Google Classroom Code:** | nk2jjwx |
| **Instructor:** | Redwan Ahmed Rizvee |
| **Room** | 413 |
| **Contact:** | [rizvee@cse.du.ac.bd](mailto:rizvee@cse.du.ac.bd) |

1. **Course Contents**

**Introduction**: Object-oriented programming overview. **Object-Oriented Concepts:** Modeling problems using object-oriented concepts. Introduction to UML. Encapsulation, Inheritance and Polymorphism. Object Oriented vs. Procedural programming, Basics of Object Oriented Programming language. **Objects and Classes:** Attributes and functions, constructors and destructors, functions or methods, overloading methods, access control, and special considerations in different languages. **I/O:** Stream and files. **Inheritance:** Inheriting classes, subclass, superclass, access control, inheritance hierarchy, overriding, dynamic binding, abstract class, inner classes, special considerations in different languages, multiple inheritance, interface. **Exception and exception handling:** Exception handling fundamentals, exception types, chained exceptions, creating own exception subclasses. **Generics or Templates:** Special considerations in different languages. **Package/Namespace:** Understanding and implementing package/namespace. **Object-oriented Design Principles and examples:** Introduction to object-oriented design principles and examples, introduction to object-oriented design. **Case Study using Object Oriented Programming.**

1. **Course Materials**

* **Textbook:** Java, The Complete Reference 11th Edition - Herbert Schildt
* **Resources: [[Github link](https://github.com/rizveeredwan/course-contents/tree/main/CSE-2102)]**

1. **Lecture Plan**

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| **Lecture** | **Topics** |
| 1 | **Introduction**: Object-oriented programming overview. Basics of a Java Program, how to compile and run. |
| 2-3 | **Data Types, variables, and Arrays**  **Operators & Contol Statements:** Arithmetic, Bitwise, IF-Else  **Loop:** For and while |
| 4-7 | **Classes:**   * Understanding classes, attributes, constructors, and methods. Declaring an object of a class * Method overloading, Understanding method parameters, and return type * Introduction to Access Control (Public, Private, Protected), static and Final keyword * Correspondence between multiple classes * Class import and concept of package |
| 8-9 | **Inheritance**   * Basics of Inheritance, the underlying concepts * Usage of super keyword and multiclass hierarchy * Different usage of constructors * Method overriding, understanding the difference between method overloading and overriding * Usage of Abstract Classes * Using Final with Inheritance |
| 10-11 | **Interface**   * Definition, implementation, and usage of an interface * Extending interfaces * Default interface and multiple interface * Static methods and private interface |
| 12-13 | **Exception Handling**   * Basics of Exception Handling * Understanding try-catch and finally, Multiple-catch statements |
| 14-15 | **Java I/O**   * Different types of streams * Reading from and writing into the console * Reading from and writing to a file |
| 16-17 | **String**   * String-related different operations, functions, and operators |
| 18-19 | An Introduction to **Java Socket Programming** |
| 20-21 | **A basic introduction to Java Collection Framework**   * ArrayList * LinkedList * PriorityQueue * HashSet |
| 22-23 | **Threaded Programming in Java**   * Single Thread * Multi Thread * Synchronization * Interthread communication |
| 24 | **UML Diagram** to represent object-oriented principles |
| 25-26 | An Introduction to **Java AWT** and Working with Images/ Springboot Framework |
| 27 | Understanding OOP Principles in Python  Introduction to Design Patterns and Principles |

1. **Evaluation and Grading**

This course will be evaluated out of 100 marks including continuous assessments and final examinations following the grading policy of the University of Dhaka for regular undergraduate and graduate degree programs. Below are the tentative marks distribution.

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| **Component** | **Marks** |
| Incourse | 20 |
| Quiz | 5 |
| Assignment | 5 |
| Final Exam | 70 |

1. **Academic Dishonesty**

Any act of academic dishonesty including the adoption of unfair means in the examinations, copying from others, and submission of a plagiarized term paper or case presentation or any designated report exercised by a student will result in an ‘F’ grade in the concerned course subject to the determination of the instructors.