

**Second Semester 2023-2024**

**Course Handout – Part II**

**Date: 09.01.2024**

In addition to Part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

**Course Number : CS F213**

**Course Title : Object Oriented Programming**

**Instructor In-Charge : Dipanjan Chakraborty**

**Additional Instructors: Aritra Mukherjee, Abhijit Das**

**1. Scope of the course:**

The scope of this course includes basics of Object Oriented Concepts; Fundamentals of Object model; Essential features of Object model; Classes and Objects; Operations/Methods and Messages; Abstraction mechanism; Inheritance; Polymorphism; Multithreading; Exception handling; I/O; Event handling; Object serialization; Process of Object Oriented Design; Design Patterns; Brief introduction to other Object Oriented Languages (other than Java).

**2. Course objectives:**

* To provide the student with an understanding of the need for Object Oriented Paradigm.
* To gain knowledge on important features of Object Orientation with the help of the Java programming language, including I/O, Multithreading, Swing and Exception Handling
* To gain basic knowledge on Object Oriented Design methodology, and notations in modeling.
* To get a rough idea about Object Oriented Design Patterns.

## 3. Text Book:

**T1:** The Complete Reference- Java, 12th Edition, Herbert Schildt, Tata McGraw Hill Publishing, 2023.

**T2:** The Object-Oriented Thought Process, Matt Weisfeld, Fifth Edition, Addison-Wesley,

2023.

**4. Reference Books:**

**R1.** Object Oriented Analysis and Design with Applications, Grady Booch, Addison Wesley,

2nd Edition.

**R2.** The Unified Modeling Language User Guide, the ultimate tutorial to the UML from the Original

Designers, G Booch, J Rumbaugh, I Jacobson, Pearson Education, 2006.

**R3.** Head First Java, Kathy Sierra, Bert Bates and Trisha Gee. O’Reilly, 3rd Edition, 2023.

**5.Course Plan**

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| **Lecture No.** | **Learning Objectives** | **Topics Covered** | **Chapters** |
| **1-3** | To understand the need for Object Oriented Programming Paradigm | Introduction to Object Oriented Concepts and Principles | T1: Ch 1; T2: Ch.1 & 2; and Class notes |
| **4-8** | To learn the fundamentals of Object model in terms of classes and methods | Object Model | T1: Ch 6; T2: Ch.1 & 2; and Class notes |
| **9-12** | Classes and Objects | T1: Ch 6; T2: Ch.1 & 2; R1: Ch.3 and Class notes |
| **13** | Encapsulation and Data hiding | T1: Ch 6, 7; T2: Ch.1 & 2; and Class notes |
| **14-15** | Methods and Messages | T1: Ch 7, 8; T2: Ch.1 & 2; R1: Ch.3; and Class notes |
| **16-17** | To understand the basics of class hierarchies in Object Orientation | Classification and Abstraction mechanism, Introduction to Swing | T1: Ch 31, 32, 33; T2: Ch.1 & 2; and Class notes |
| **18-20** | Inheritance and Polymorphism, making GUI in java for further concepts | T1: Ch 7, 8; T2: Ch.7 |
| **21-25** | To understand multithreading concepts and apply it through Java programming | Multithreading and Synchronization concepts | T1 Ch 11; and class notes |
| **26-28** | To learn Java Exception handling mechanism | Exception Handling essentials | T1 Ch 10; |
| **29-32** | To learn and work with IO streams in Java | I/O Streams | T1: Ch.13, 19 |
| **33** | Object Serialization | T1: Ch 21, T2: Ch.12; R1: Ch.19 |
| **34-35** | To understand some important Classes in java.lang and java.util packages including Java Collection framework | java.lang classes  and java.util classes | T1: Ch 18 |
| **36-38** | Introducing students to Object Oriented Analysis and Design activity in the context of UML | Process of Object Oriented Design | T2: Ch.10; R1: Ch. 2-5; R2 for notations; and Class notes |
| **39** | Object Oriented Design Patterns | T2: Ch.15 and Class notes |
| **40-41** | To provide an overview of other popular Object Oriented Programming Languages | Object oriented Programming languages (overview) | R1: Appendix; and Class notes |
| **42** |  | Conclusion |  |

**6. Evaluation**

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| **Component** | **Duration** | **Mode** | **Date & Time** | **Weightage** |
| Mid-semester Test | 90 Mins. | Closed Book | 15/03 - 11.00 - 12.30PM | 30% |
| Mini Assignments (3 no.s) | Take home | Open Book | To be announced | 15% |
| Major Assignment | Take home | Open Book | To be announced | 15% |
| Comprehensive Exam | 180 Mins. | Closed Book | 16th May, 2024, AN | 40% |

\*40% of the Evaluation will be completed by Mid Semester Grading.

**7. Make-up Policy:**

Make-up requests for the mid-semester and comprehensive examinations will be thoroughly scrutinised and the decision of the I/C will be final. No make-up will be allowed for other components.

**8. Course Notices**

All announcements will be made in the classes only. It is incumbent on the students to apprise themselves about the announcements.

**9. Chamber Consultation:** To be announced.

**10.Academic Honesty and Integrity Policy:**

Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

**Instructor-In-Charge, CS F213**