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**First Semester 2023-2024**

**Course Handout – Part II**

**Date: 11.08.2023**

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 : Dr. Aritra Mukherjee**

**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 Applications (other than Java). Important point to be noted is that the important Object Oriented Concepts like- Exceptions, Multithreading, IO etc., are understood by working with 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 Java (through hands-on lab experience), 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 object-oriented thought process, Matt Weisfeld, Third Edition, Addison-Wesley,

2013.

**T2**: Object-Oriented Programming and Java, Danny Poo, Derek Kiong, Swarnalatha Ashok, Second Edition, Springer, 2008.

**4. Reference Books:**

**R1.** The Complete Reference- Java, 7th Edition, Herbert Schildt, Tata McGraw Hill Publishing.

**R2.** Object Oriented Analysis and Design with Applications, Grady Booch, Addison Wesley,

2nd Edition.

**R3.** 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.

**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 & 2; T2: Ch.1 and Class notes |
| **4-8** | To learn the fundamentals of Object model in terms of classes and methods | Object Model | T1: Ch.1 & 2; T2: Ch.1 and Class notes |
| **9-12** | Classes and Objects | T1: Ch.1 & 2; T2: Ch.2; R1: Ch.6 & 7;  R2: Ch.3 and Class notes |
| **13** | Encapsulation and Data hiding | T1: Ch.1 & 2; R1: Ch.2; and Class notes |
| **14-15** | Methods and Messages | T1: Ch.1 & 2; R1: Ch.6 & 7; R2: 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.1 & 2; T2: Ch.5; and Class notes |
| **18-20** | Inheritance and Polymorphism, making GUI in java for further concepts | T1: Ch.7; T2: Ch.6 &7; R1: Ch.7 & 8 |
| **21-25** | To understand multithreading concepts and apply it through Java programming | Multithreading and Synchronization concepts | T2: Ch.11; R1: Ch.11; and class notes |
| **26-28** | To learn Java Exception handling mechanism | Exception Handling essentials | T2: Ch.9; R1: Ch.10 |
| **29-32** | To learn and work with IO streams in Java | I/O Streams | T2: Ch.10; R1: Ch.13 & 19 |
| **33** | Object Serialization | T1: Ch.12; R2: 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 | R1: Ch. |
| **36-38** | Introducing students to Object Oriented Analysis and Design activity in the context of UML | Process of Object Oriented Design | T1: Ch.10; R2: Ch. 2-5; R3 for notations; and Class notes |
| **39** | Object Oriented Design Patterns | T1: Ch.15 and Class notes |
| **40-41** | To provide an overview of other popular Object Oriented Programming Languages | Object oriented Programming languages (overview) | R2: 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 | 13/10 - 2.00 - 3.30PM | 30% |
| Class Interaction | TBA | Closed/Open Book | TBA | 5% |
| Mini-project | Take home | Open Book | To be announced | 20% (10% evaluation will be done by midsem) |
| End-semester Lab Exam | 60 Mins. | Open Book | To be announced | 10% |
| Comprehensive Exam | 180 Mins. | Closed Book | 19/12 FN | 35% |

**7. Make-up Policy:**

Make-up for Mid-semester test may be given for genuine cases with prior permission by IC, and after rigorous scrutiny. For the Comprehensive exam, make-up has to be approved and scheduled by AUGSD and will be allowed under extreme conditions only.

**8. Course Notices**

All notices pertaining to this course will be displayed on the Google Classroom, as applicable.

**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**