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**SECOND SEMESTER 2022-2023**

**Course Handout – Part II**

**Date: 16.01.2023**

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. Abhijit Das**

**Other Instructors : Dr. Subhrakanata Panda, Dr. Aritra Mukherjee, Dr. Aneesh Sreevallabh Chivukula, Prerna Saurabh, Deepa Kumari, Chaitra C R**

1. **Scope of the course:**

This course is offered to those who have completed a course on C-programming, which is one among the popular procedure-oriented programming languages. Important point to be noted is that the features/concepts Object Oriented paradigm are investigated and understood by working with Java.

The scope of this course includes- need for the Object Oriented (OO) paradigm; fundamental features of OO paradigm like- encapsulation, inheritance, polymorphism and abstraction; use of Classes and Objects; basic components of class-data and behavior/operations; basics of Java programming language- data types, operators, constructs, classes, methods etc., writing multithreaded programs in Java ; Java Exception handling; Java Input and output model and Object serialization; Java AWT supporting GUI development with Event handling mechanism; Java Collections Framework and important Utility classes. The scope also includes- a brief introduction to Object Oriented Analysis and Design (OOAD) process; Introduction to Design Patterns; Summary of other important Object Oriented Languages (other than Java).

**2. Course objectives:**

* To gain 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 Multithreading, Exception Handling and Input/Output.
* To make the student understand how GUI applications can be developed with Java with sufficient hands-on.
* To gain basic knowledge on Object Oriented Design methodology, UML modeling and Design patterns.

## 3. Text Book:

**T1:** The object-oriented thought process, Matt Weisfeld, Third Edition, Addison-Wesley, 2013.

**T2:** The Complete Reference- Java, 11th Edition, Herbert Schildt, Tata McGraw Hill Publishing. 2019.

**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.

**5.Course Plan**

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| **Lecture No.** | **Learning Objectives** | **Topics to be covered** | **Chapter in the Text Book** |
| **1-3** | To understand the need for Object Orientated Programming Paradigm  ; and to know the basics of OO paradigm. | Introduction to Object Oriented Concepts | T1: Ch.1 and Class notes |
| **4-5** | To understand the difference between the interface and implementation; object behavior and to know how to identify the public interfaces. | Thinking in terms of Objects | T1: Ch.2 and Class notes |
| **6-9** | To understand the theory behind OO concepts like- constructors, Error handling, Scoping, Overloading, Multiple inheritance, Operations, serialization etc. | Advanced OO concepts | T1: Ch.3; and class notes |
| **10-12** | To understand the structure of a class in Java. | Introducing classes | T2: Ch.6 |
| **13-15** | To understand how to add methods to classes. | More on Methods and Classes | T2: Ch.7 |
| **16-17** | To understand the concepts related to inheritance supported by Java and to learn how to design programs that use inheritance. | Inheritance | T2: Ch.8 |
| **18-21** | To learn Java Exception handling mechanism | Exception Handling | T2: Ch.10 |
| **22-25** | To understand multithreading concepts and apply it through Java programming | Multithreaded Programming | T2. Ch.11 |
| **26-28** | To learn and work with IO streams in Java; and to understand the process of Object serialization supported by Java | Input and Output Model | T2. Ch.13 & 21 |
| **29-30** | To understand how to process strings in Java, using libraries | String Handling in Java | T2. Ch.17 |
| **31-32** | To study some important Classes in java.lang package | Exploring java.lang | T2: Ch.18 |
| **33-34** | To understand some important Classes in java.util package including Java Collection framework | Exploring java.util package and Collection Framework | T2. Ch.19 & 20 |
| **35-38** | Introducing students to Object Oriented Analysis and Design activity in the context of UML | Process of Object Oriented Design and UML | T1: Ch.10; R1: Ch. 2-5; R2 for UML notations; and Class notes |
| **39-40** | Object Oriented Design Patterns | T1: Ch.15 and Class notes |
| **41** | To get an overview of other popular Object Oriented Programming Languages | Object oriented Programming languages (overview) | Class notes |
| **42** |  | Conclusion to the course |  |

**6. Evaluation**

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| **Component** | **Duration** | **Date & Time** | **Weightage** | **Nature of Component** |
| Mid-semester Test | 90 Mins. | 17/03 4.00 - 5.30PM | 35% | Closed Book |
| Mini-project (Out of 15% weightage, 5% evaluation will be completed before Mid-semester grading) | Take home | To be announced | 15% | Open Book |
| End-semester Lab Exam | 60 Mins. | To be announced | 10% | Open Book |
| Comprehensive Exam | 180 Mins. | 18/05 AN | 40% | Closed Book |

**7. Make-up Policy:**

Make-up for mid semester exam and comprehensive exam will be granted **only** on genuine grounds of sickness **(***to be supported by a medical certificate and not a prescription*). There is NO makeup for other evaluation components.

**8. Course Notices**

All notices pertaining to this course will be displayed on the CMS.

**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.

**Dr. Abhijit Das**

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