

**SECOND SEMESTER 2020-21**

**COURSE HANDOUT (PART II)**

**Date: 16/01/2021**

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. S. Panda**

**Instructors  :** Dr. D V N Sivakumar, Dr. Ayan Das, Ms. Deepa Kumari, Ms. T Sahithi

**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:**

* 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).
* To gain basic knowledge on Object Oriented Analysis & Design methodology, and notations in modeling.
* To get a rough idea about Object Oriented Design Patterns.

## 3. Text Book:

**T1:** Object Oriented Design and patterns, Cay Hortsmann, Wiley, 2004.

**4. Reference Books:**

**R1.** The Complete Reference- Java, 5th 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.

**R4.** Java How to Program, Paul Deitel, Harvey Deitel, Pearson Education, 10th Edition, 2018

**5.Lecture Schedule:**

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| --- | --- | --- | --- |
| **Lecture No.** | **Learning Objectives** | **Topics Covered** | **Chapter in the Text Book** |
| **MODULE-1** | | | |
| **1** | Getting introduced to the course content, evaluation components, objectives, and outcomes. | General introduction to the course | - |
| **2-4** | To understand the need for Object Orientated Programming Paradigm | Introduction to Object Oriented Analysis and Design, Concepts and Principles | T1- Ch.2&3; R2-Ch. 2-5; R3 for notations; and Class notes |
| **5- 7** | To learn the fundamentals of Object model in terms of classes and methods | Object Model | T1-Ch.2 ; R2- Ch.2 |
| Classes and Objects | T1- Ch.2&3; R1-Ch.6,7;  R2-Ch.3 |
| Classification and Abstraction mechanism , Encapsulation and Data hiding | T1.Ch.2; R2- Ch.4; T1-Ch.3; R1.ch.2; and Class notes |
| Methods and Messages | T1.Ch.3; R1-Ch.6,7 ; R2-Ch.3; and Class notes |
| **8-10** | To understand the basics of class hierarchies in Object Orientation | Packages, Inheritance and Polymorphism and Interfaces | T1 –Ch.6; R1.Ch.7&8; R4-Ch.10 |
| **Self-Study** | To understand the use of Selection Statements | If statements, Nested if statements, Boolean expressions and variables, comparing objects, switch statements | R1-Ch.5 |
| **Self-Study** | To understand the use of Repetition Statements | While statement, do-while statement, for and nested for statements, estimating the execution time, recursive methods (To be discussed in Tutorial classes) | R1-Ch.5 |
| **10-11** | To understand and apply characters and string concepts for problem solving | Characters, strings, comparing strings, string Buffer and string Builder, Pattern matching and regular expressions. | R1- Ch.13, Ch.24; R4 – Ch. 14 |
| **12-14** | To understand and apply array and collection framework classes for problem solving | Array basics, array of objects, for-each loop, passing arrays to methods, 2D-arrays, Collection Framework. | R1-Ch.3, Ch.15; R4- Ch. 7 |
| **15-16** | To understand and apply sorting and searching mechanisms | Searching methods, sorting methods, Heap sort | Class Notes; R4-Ch.19 |
| **MODULE-2** | | | |
| **17-19** | To learn Java Exception handling mechanism and assertions | Catching exceptions, throwing exceptions and multiple catch blocks, propagating exceptions, Types of exceptions, programmer-defined exceptions, Assertions. | T1.Ch.1.8; R1-Ch.10; R4-Ch. 11, Class Notes |
| **20-25** | To create GUI programming | GUI Components and Event Handling mechanisms | R1-Ch. 12, Ch.20, Ch.21 |
| **26-27** | To handle Graphics in Java | Graphics | R4-Ch.13 |
| **28-30** | To understand multithreading concepts and apply it through Java programming and work with IO streams in Java | Multithreading and Synchronization concepts | T1 –Ch.9; R1- Ch.11; and class notes |
| I/O Streams | R1- Ch.13 and Ch.19 |
| Object Serialization | T1.Ch.7.5; R2- Ch.19 |
| **31-32** | To learn and apply different design patterns | Object Oriented Design Patterns | T1- Ch.5&11 |
| **MODULE-3** | | | |
| **33-34** | To be able to access Databases with JDBC | JDBC connection | R4-Ch.24 |
| **35-39** | To understand the principles of testing OOPs | Testing and Debugging OOP | Class Notes |
| **40-42** | To learn Python | Introduction to Python Programming | Class notes |

**5. Evaluation**

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| --- | --- | --- | --- | --- |
| **Component** | **Duration**  **(mins)** | **Mode** | **Date & Time** | **Weightage** |
| Mid-Semester | 90 | Open Book | 03/03 3.30 - 5.00PM | 35% |
| Quiz (1) |  | Open Book | PRE-MID SEMESTER | 10% |
| LAB Project (LP) |  | Open Book | To be Announced in Course Portal | 15% |
| Comprehensive | 120 | Open Book | 08/05 FN | 40% |

**6. Make-up Policy**

No make-up for CLE, LP components. No makeup exam allowed without prior permission. Rules and regulations of AUGSD is to be strictly followed.

**7. Course Notices**

All notices pertaining to this course will be displayed on the Course portal (CMS).

**8. Chamber Consultation**

To be announced.

**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.**