

**FIRST SEMESTER 2020-21**

**COURSE HANDOUT (PART II)**

**Date: 17/08/2020**

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. Manik Gupta, Dr. D V N Sivakumar, Ms. B S A S Rajita, Ms. Ramisetty Kavya, Ms. Deepa Kumari, Ms. Chavali Lalitha

**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** | **Chapters** |
| **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** | | | |
| **33-35** | To develop Socket programming and client server applications | Networking | R1-Ch.18 |
| **36-37** | To be able to access Databases with JDBC | JDBC connection | R4-Ch.24 |
| **38-39** | 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** |
| Test-1 | 30 | Open Book | September 10 –September 20  (during scheduled class Hour) | 15% |
| Test-2 | 30 | Open Book | October 9-October 20(during scheduled class hour) | 15% |
| Test-3 | 30 | Open Book | November 10-November 20 during scheduled class hour) | 15% |
| Continuous Lab Evaluation (CLE) |  | Open Book | Weekly Lab Assignments(Take home) to be given by instructors based on topic covered in the LAB | 5% |
| LAB Project (LP) |  | Open Book | To be Announced in Course Portal | 15% |
| Comprehensive | 120 | Open Book | To be announced by TT Division | 35% |

**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 CMS.

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

**9. 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.

**CSF213 Lab Content Coverage Plan**

**Declaration: Since the classes will be held in online mode. So students are required to install Java and Eclipse in their respective Laptops/Desktops and practice on their own.**

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| **Week#** | **Lab/Tut coverage of topics** | **Ref** |
| 1 | Basics of Java; Writing program, Compiling and running first Java Program; Data types. Some sample programs to print output. Basic Java Program- ‘Hello World’ Program through GUI.  Note: GUI to be introduced as early as possible. | Ch.1, 2 & 3 of Complete Ref.  5th Ed. |
| 2 | Sample programs to declare variables, practice operators and control statements. Operators, Use of if .. else if .. else, case statements, while and do .. while, for Loop statements, Passing command line arguments, Arrays, Recursion (factorial). | Ch.3, 4 & 5 |
| 3 | Programs on defining classes, declaring variables, writing methods; Students will write programs to work on various kinds of constructors and use ‘this’, ‘super’ keyword.  Use of static keyword | Ch.6 |
| ***4*** | ***Buffer Session (To discuss selective problems or advanced concepts)*** |  |
| 5 | Write program to learn- Method overloading, objects as parameters, methods returning objects, access control; Write program to work with- static, inheritance, final, String class. Write a program for Stack application. | Ch.7, 8, and 9 |
| 6 | Characters, strings, comparing strings, string Buffer and string Builder, Pattern matching and regular expressions. | Ch. 13 and 24 |
| 7 | Java Util package: Intro to Java Collections Framework, ArrayLists, Enumerators, HashTable, Maps, Vector, StringTokenizer, Date etc. | Ch. 15, 16, |
| 8 | Exception Handling, Arithmetic, AIOB exceptions, Use of try-catch-finally-throw-throws. Writing and using user defined exceptions. | CH.10 |
| ***9*** | ***Buffer Session (To discuss selective problems or advanced concepts)*** |  |
| 10 | Java AWT: Components, Frame, Layouts, Graphics, Containers, Controls like- button, TA, TF, Choice, Menu, Dialog, Event handling – Listeners/Adapters | Ch.22. 23 and 24 |
| 11 | Write a program to understand IO classes, character/byte-oriented streams, accepting input from the keyboard, File, writing and reading from files, Random access files, Data IO streams. Object IO streams. | Ch.13 and 19 |
| 12 | Networking: Introduction to Socket Programming | Ch. 18 |
| 13 | Introduction to JDBC | R4-Ch.24 |
| **14** | ***Buffer Session (To discuss selective problems or advanced concepts)*** |  |

Instructor In-Charge

CSF213