Birla Institute of Technology & Science, Pilani
Hyderabad Campus

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:

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

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	35%

			Division	

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.

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	Ch.22. 23 and

	like- button, TA, TF, Choice, Menu, Dialog, Event handling – Listeners/Adapters	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