Birla Institute of Technology & Science, Pilani
Hyderabad Campus

SECOND SEMESTER 2018-19
COURSE HANDOUT (PART II)

Date: 07/01/2019

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 No. **: CS F213**
Course Title **: Object Oriented Programming**
Instructor-In-Charge**: Dr. Barsha Mitra (barsha.mitra@hyderabad.bits-pilani.ac.in)**
Instructors **: Mrs. Rashmi Sahay**

Scope and Objectives of the Course:

Object-oriented programming is one of the important means of building complex systems. In order to handle the inherent complexity associated with building structured systems, it is essential to gain a good understanding of object-oriented design. This course aims at introducing the students to the object-oriented paradigm and gradually build a knowledge base which will include object-oriented design, various design patterns and the Java programming language. After going through this course, the students will have gathered an understanding of the above mentioned concepts and will be able to apply them in practical scenarios.

The following points outline the objectives of the course:

- Providing the students with an understanding of the need for Object Oriented Paradigm.
- Understanding the basics of object model like Classes, Objects, Associations, Operations/Methods, and Encapsulation etc.
- Understanding the important features of object orientation, like Abstraction, Inheritance, Polymorphism, Serialization etc.
- Understanding the concepts like Multithreading, Exception handling, IO, Collections Framework and Event handling.
- Obtaining basic knowledge on Object Oriented Design methodology, and notations in UML modeling.
- Learning the concept and use of Object Oriented Design Patterns.
- Understanding the above-mentioned concepts of object orientation through hands-on experience by working on Java during the lab sessions.

Text Book:

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

Reference Books:

R1. Java - The Complete Reference, 9th 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, Grady Booch, James Rumbaugh, Ivar Jacobson, Pearson Education, 2006.

Course Plan:

Lecture No.	Learning Objectives	Topics to be covered	Chapters
1-2	Course overview and understand the motivation behind learning the course	Introduction to Object Oriented Concepts and Principles	T1-Ch. 2 ; R2-Ch. 1 and Class notes
3-4	Identify and understand the elements of object model to develop the intuition behind building complex systems	Fundamentals of Object Model	T1-Ch. 2 ; R2- Ch. 2
5	Learn the OOP principle of encapsulation and data hiding as a precursor to understanding classes	Encapsulation and Data hiding	T1-Ch. 3; R1-Ch. 2; R2-Ch. 2(Section 2.2)
6	Learn different data types, variables and arrays	Data types, variables and arrays	R1-Ch. 3
7-9	Understand the basic building blocks of object-oriented programming	Classes, Class Relationships, Objects and Constructors	T1-Ch. 2 & 3; R1-Ch. 6 & 7; R2-Ch. 3
10-11	Understand the concepts related to methods and messages	Methods, Method Overloading and Messages	T1-Ch. 3; R1-Ch. 6 & 7; R2-Ch. 3; and Class notes
12-13	Develop the ability to identify classes by gaining an understanding of classification and abstraction	Classification and Abstraction mechanism	T1-Ch. 2; R1-Ch. 2; R2-Ch. 2 & 4
14-17	Understand the concepts related to hierarchy among classes	Inheritance, Polymorphism, Method Overriding	T1-Ch.6; R1-Ch.7 & 8
18-20	Learn to create and use packages and interfaces	Packages and Interfaces	R1-Ch. 9
21-22	Learn about types of exceptions and ways for handling them	Exception Handling	T1-Ch.1.8; R1-Ch.10
23-25	Learn concepts related to thread model, thread creation and gain the ability to ensure synchronization among threads during resource access	Multithreading and Synchronization	T1-Ch.9; R1-Ch.11; and Class notes
26-28	Understand I/O handling and manipulation in Java (console I/O, file I/O)	I/O Streams	R1- Ch.13 and Ch.20

Lecture No.	Learning Objectives	Topics to be covered	Chapters
29	Understand strings and how to handle them	String Handling and String Tokenizer	R1-Ch. 16, Ch. 19
30	Learn to save object state through serialization	Object Serialization	T1-Ch.7.5; R1-Ch.20
31	Understand pre-defined data structures of Java library	Collections Framework	R1-Ch.18
32-37	Understand the keys concepts related to UML for using in system design	Process of Object Oriented Design	T1-Ch. 2 ; R2-Ch. 5; R3 for notations; and Class notes
38-40	Identify and analyze the features of the different object oriented design patterns	Object Oriented Design Patterns	T1-Ch. 5 & 10
41	Learn the methodology to build object oriented applications	Sample Applications to understand object orientation features from the application perspective	R2-Ch. 8 & 10
42	Reviewing object oriented languages other than Java	Object oriented Programming languages (overview)	R2-Appendix; and Class notes

Evaluation

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Mid Semester Examination	1.5 hours	25%	16/3 11.00 -12.30 PM	Closed Book
Mini Project	-	15%	-	Open Book
Lab Test	-	15%	-	Open Book
Comprehensive Examination	3 hours	45%	13/05 AN	Closed Book

Chamber Consultation Hour:
To be announced in class.

Notices:
All notices pertaining to this course will be displayed on the CS&IS Notice Board and/or CMS.

Make-up Policy:

- ***No Make-ups for lab test and mini project.***
- Prior permission of the Instructor-in-Charge is required to get make-up for the Mid-Sem. Only on producing documentary proof of possible absence, which proves that student would be physically unable to appear for the exam, the decision of granting the make-up will be taken.
- Prior permission of Dean, Instruction Division is required to get make-up for the comprehensive exam.
- Instructor-in-charge's / Dean's decision in the matter of granting make-up would be final.

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