Object-Oriented Analysis and Design using JAVA (20B12CS334)

B.Tech (CSE/IT) 5th SEM
2021-2022

Outline

1) Course Details
2) Course Outcomes
3) Course Outline
4) Resources: Text Books/Reference Books
5) Resources: E-contents and Platforms
6) Assessment / Marking Scheme
7) Team at Sector 62 campus
8) Team at Sector 128 campus
9) Instructions for Students

Course Detail

Course Code	20B12CS334	**Semester** Odd **Branch** Computer Science and Engineering	**Semester III** **Session** 2020 -2021 **Month from** August to December
Course Name	Object-oriented Analysis and Design with JAVA		
Credits	4	**Contact Hours**	3 (L) + 1 (T)

Course Outcomes

At the end of this course, you will be able to :

COURSE OUTCOMES		COGNITIVE LEVELS
C330-4.1	Illustrate Object Oriented Design and convert it to its code using JAVA Programming language.	Understand (Level 2)
C330-4.2	Dissect the requirements to identify the potential use cases, classes and objects in the system	Analyze (Level 4)
C330-4.3	Build UML diagrams such as class diagram, object diagram for structural modelling and state chart diagram, sequence diagrams for behavioural modelling.	Apply (Level 3)
C330-4.4	Create solutions to solve real world problems. using objectoriented analysis and design principles.	Apply (Level 3)
C330-4.5	Estimate the complexity of object-oriented designs using several metrics.	Evaluate (Level 5)

Course Description

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
1.	Introduction to Principlesof Object Oriented Analysis and Design	Programming Paradigms, Introduction to Object Oriented Paradigm, Principles of Object Orientation, Software Complexity: Benefits and Understanding the challenges OOAD can address, Overview of Software Development Life Cycle (SDLC) & Rational Unified Process (RUP), Object-Oriented Requirements Elicitation & Analysis and Systems Behavior, Quality Attributes, Software Architect and Design Roles in Industry, Conceptual and Technical Designs, Competing Qualities and Trade-offs, Record, Organize, and Refine Components	4
2.	Object Oriented Analysis	Identifying Classes and Objects, Responsibilities, Relationships in problem domain, Object Model, Methods of Class Identification, Listing nouns and Verbs, Synonyms, Attributes and Methods	8

Course Description

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
3.	Object Oriented analysis with UML	UML structure: Overview of static and dynamic UML diagrams, Modeling System Behavior with use case diagram and notations, From Use Cases to Functional Requirements, Elements of object and class diagram with notations: object, class, link, association, multiplicity, link attributes, association end names, association classes, qualified association, association ends, N-ray association, aggregation and composition, generalization, abstract class, Sequence & Collaboration diagram with notations, Object Collaborations, Interaction Diagrams, State Diagram - Event ,Change Event, Signal Event, Call Event, Time Event , States, Transition & Conditions, Transition, Guard Condition, Action, State Diagrams, One shot State Diagram, Creating State Diagram, State Diagram Behaviour, Activity, Do-activity, Entry Activity, Exit Activity, Nested State Diagram, Nested States, Signal Generalization, Concurrency, Activity and Swim lane diagram, Elements of Component and deployment Diagram Object Constraint Language(OCL)	8

Course Description

Module No.	Title of the Module	Topics in the Module	No. of Lectures for the module
4.	Converting Design to Code in JAVA	Objects and Classes in JAVA, Implementing various relationships in JAVA- Association, Inheritance, generalization, Abstraction in Java, Method Overriding and Overloading, Object Roles, Class Types, Implementing Polymorphism, Extensibility and UML, Generalization with Interfaces and Packages in Java	10
5.	Design Principles	SOLID principles, Cohesion, Coupling, techniques for good Object-Oriented design, separation of concerns, information hiding, and conceptual integrity	6
6.	OO Design Metrics	Understanding and Analyzing Software Design Metrics for Object Oriented Software.	6
		Total number of Lectures	**42**

Resources: Text Books/Reference Books

Text Books

1.	Object Oriented Modeling And Design With UML 2nd Edition by MICHAEL BLAHA and JAMES RUMBAUGH, PEARSON INDIA 2013
2.	UML 2 AND THE UNIFIED PROCESS: Practical Object-oriented Analysis and Design 2nd Editon by Jim Arlow, Pearson 2015
3.	The Object-Oriented Thought Process: Object Or Thought Process by Matt Weisfeld 2013
4.	Java: The Complete Reference, Eleventh Edition by Herbert Schildt , 2019
5.	Core Java Volume I--Fundamentals (Core Series) 11th Edition, by Cay S. Horstmann, 2018

Reference Books

1.	Head First Object-Oriented Analysis and Design A Brain Friendly Guide to OOA&D By Brett McLaughlin, Gary Pollice, David West 2011
2.	An Introduction to Programming and Object-Oriented Design with Java by Frederick A. Hosch Jaime Nino 2009
3.	OBJECT-ORIENTED ANALYSIS AND DESIGN With applications Third EDITION Grady Booch Rational Santa Clara, California 2009
4.	Object Oriented Analysis and Design Andrew Haigh 2001
5.	UML and C++ A practical approach to OO Development, 1997

Assessment / Marking Scheme

Component		Maximum Marks
T1		20
T2		20
End Term Examination		35
TA (breakup below)		25
	Attendance	07
	Internal Assessment	05
	Assignments	06
	Quiz/Online Test	07
Total		**100**

Instructions for Students

- Before joining the lecture, camera must be off and mic should be muted.
- Always join the lecture with a notebook and pen with you. This will be used to solve examples in the class.
- All students need to present in the meeting for full time, random attendance can be taken at any time.
- Unnecessary or unethical activity will not be entertained. If any student is found doing so, he/she will be removed from the class.
- Tutorials will be problem based and hence you are advised to come prepared (study last week's lectures).

Note: Anybody can be asked at any time during the lecture to turn on the camera or mic for interaction or questions.

Team

Faculty at J62 Campus

Name: Sulabh Tyagi

Email id:

Faculty at J128 Campus

Name: Dr. Raju Pal

Email id: Raju.pal@mail.jiit.ac.in

Thank You