Detailed Syllabus
Lecture-wise Breakup

Course Code		**Semester ODD**	**Semester: 5th Session:** 2020 - 2021 **Month from:** July **to** Dec 2020
Course Name	**Object Oriented Analysis and Design Using JAVA**		
Credits	3-0-0	**Contact Hours**	3

Faculty (Names)	**Coordinator(s)**	
	Teacher(s) (Alphabetically)	

COURSE OUTCOMES		**COGNITIVE LEVELS**
CO1	Illustrate Object Oriented Design and convert it to its code using JAVA Programming language.	Understand Level (C2)
CO2	Dissect the requirements to identify the potential use cases, classes and objects in the system.	Analyze Level (C4)
CO3	Build UML diagrams such as class diagram, object diagram for structural modelling and state chart diagram, sequence diagrams for behavioural modelling.	Apply Level (C3)
CO4	Create solutions to solve real world problems. using object-oriented analysis and design principles.	Create Level (C6)
CO5	Estimate the complexity of object-oriented designs using several metrics.	Evaluate Level (C5)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction to Principles of 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

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
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**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (**Attendance-07, Class Test/ Quizze-07, Internal assessment-05, Assignment-06)**
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

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: ObjectOr 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