Course Code	Course Title	L	T	P	C
BITE404E	Object Oriented Analysis and Design	2	0	2	3
Pre-requisite	BCSE102L, BCSE102P	Syllabus version			
		1.0			

Course Objectives:

1. To learn the basic principles of object orientation and notation.
2. To familiarize Unified Modeling Language.
3. To understand the Analysis and Design workflow.

Course Outcomes:

1. Analyze the fundamentals of Object oriented design elements.
2. Comprehend the limitations of object oriented analysis and design.
3. Implement different techniques available for object modelling techniques based on the limits and features
4. Analyze the objects and elements required for efficient design.
5. Design unified modelling diagrams for various case studies

Module:1	Introduction	4 hours

The Structure of Complex Systems, The Inherent Complexity of Software–Five attributes of complex system-Organized and Disorganized Complexity-The Role of Decomposition-On designing Complex systems

Module:2	Object Oriented Paradigm	4 hours

The Evolution of the Object Model-Foundations of the Object Model-Elements of the Object model-Applying the Object Model-Classes and objects-The Nature of an Object-Relationships among objects-The Nature of a Class-Relationships among classes-The interplay of classes and objects-Building Quality classes and objects.

Module:3	Analysis and Design Process	4 hours

Design Principles-The Macro Process: The Software Development Life cycle-The Micro Process: The Analysis and Design Process, Benefits and Risks of Object Oriented Development.

Module:4	Object Oriented Design using UML Diagram - Phase I	5 hours

The Unified Modelling Language-Package Diagrams-Component Diagrams-Deployment diagrams-Use case Diagrams-Activity Diagrams-Class Diagrams.

Module:5	Design using UML Diagrams – Phase II	4 hours

Sequence Diagrams-Interaction Overview Diagram-Composite Structure Diagram-State Transition Diagram-Timing Diagram-Object diagram-Communication Diagrams.

Module:6	Object Oriented Design Process	3 hours

Classification-The importance of proper classification-Identifying Classes and objects-Key Abstraction and Mechanisms.

Module:7	Object Oriented Methodologies	4 hours

Rumbaugh et al.'s object modeling technique-The Booch Methodology-The Jacobson et al. Methodologies, Discussion on few Examples of OOAD.

Module:8	**Contemporary Issues**	**2 hours**
	Total Lecture hours:	**30 hours**

Text Book	
1.	Grady Booch, Robert A. Maksimchuk, Michael W. Engle, Bobbi J. Young, Jim Conallen, Kelli A. Houston, Object Oriented Analysis and Design with Application, 3rd edition, Addison Wesley, 2018.
Reference Books	
1.	Ali Bahrami, Object Oriented System Development, Tata McGraw-Hill, 2018.
2.	Grady Booch, Ivar Jacobson, James Rumbaugh, The Unified Modelling Language User Guide, Second Edition, Pearson, 2017.
3.	Stephen R Schach, Object Oriented and Classical Software Engineering, Tata McGraw -Hill, 2017.

Mode of Evaluation: Continuous Assessment Tests, Assignment, Quiz, Final Assessment Test

Indicative Experiments		Hours
1.	Introduction to Object Oriented Analysis and Object-Oriented Design	4
2.	Identify any software system and document the IEEE Software Requirements Specification (SRS) for it.	4
3.	Draw a Use Case diagram for capturing and representing requirements of the system.	2
4	Design the overall use case diagram and a detailed use case diagram for any one key use case (other than user authentication) of the system by highlighting all possible relationships like Extends, Uses, generalization and extension points for : a. E-book management b. On-line exam registration c. Conference management system d. Student information system	2
5	Draw the basic class diagrams to identify and describe key concepts like classes, types in the chosen system and their relationships	2
6	Design an activity diagram for the object with swim lane and show parallel processing	2
7	Draw the activity diagram to show the business flows based on SRS	2
8	Design sequence diagram representing your system with objects and the messages using advanced notation	2
9	Design component diagram for the system you're building with reuse of existing and new components	2
10	Draw deployment diagram to model the runtime architecture of the chosen system	2

11	Identify the User Interface, Domain objects and technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation	2
12	Improve the reusability and maintainability of the software system by applying appropriate design patterns	2
13	Construct Timing diagram	2
	Total Laboratory Hours	**30 hours**
Mode of assessment: Continuous Assessments / FAT / Oral examination		
Recommended by Board of Studies	12-10-2022	
Approved by Academic Council	No. 68	Date 19-12-2022