

		DEPARTMENT OF COMPUTER SCIENCE AND SOFTWARE ENGINEERING		
		FACULTY OF COMPUTING		
MODULE OUTLINE				
Module Name		Object Oriented Programming		
Module Code		SE1020	Version No.	2025-1
Year/Level		1	Semester	2
Credit Points		4 Credits		
Pre-requisites		None		
Co-requisites		None		
Methods of Delivery	Lectures		2 Hours/Week	
	Tutorials		1 Hours/Week	
	Laboratories		2 Hours/Week	
Courseweb Site		http://courseweb.sliit.lk		
Date of Original Approval		June, 2024		
Date of Last Approval		June, 2024		
Date of Next Review		October, 2028		
MODULE DESCRIPTION				
Aim	The objective of this module is to introduce the object-oriented programming paradigm and related concepts. The topics discussed in the module include implementing classes, abstraction, encapsulation, polymorphism, relationships and class diagrams, error handling, collections, and best practices. Students will also get hands-on experience developing applications in Java using modern Integrated Development Environments.			
Learning Outcomes	At the end of the module, the student will be able to:			
	LO1:	Apply object oriented concepts using Java Language		
	LO2:	Demonstrate the knowledge in concurrency programming		
	LO3:	Utilize features of Java when developing an application		
	LO4:	Apply best practices for object-oriented programming for a given problem		
	LO5:	Develop class diagrams to model real-world problems		
Assessment Criteria	Assessment Description:			
	This module will have two lab assessments and assignment which are individual attempts covering different topics discussed in lectures. Also there will be a traditional mid-term exam from the topics covered before the mid-term week and a final exam will cover all aspects discussed throughout the semester			
	Assessment Activities:			
	Lab Test		10%	LO1, LO3
	Assignment		10%	LO2, LO3
	Mid Term		20%	LO1, LO3
	Lab Submission		10%	LO1 - LO4
	Final exam (Computer based)		50%	LO1 - LO4
	Total		100%	
	Contact Hours	Lectures		28 Hours
Tutorials		14 Hours		
Laboratory		28 Hours		

Estimated Student Workload	Time Allocated for Assessments	
	Lab Test	1 Hours
	Assignment	1 Hours
	Mid Term	1 Hours
	Final exam (Computer based)	3 Hours
	Reading and Independent Study	124 Hours
	Total	200 Hours
Module Pass Requirements	To pass this module, students need to obtain a 50% in “Continuous Assessments” and an overall mark that would qualify for a “C” grade or above	
Learning Resources	Recommended Texts 1. H. Schildt, Java: The Complete Reference, 12th edition, McGraw Hill, 2021, ISBN 1260463419 2. M. Brett, G. Pollice, and D. West, Head First Object-Oriented Analysis and Design: A Brain Friendly Guide to OOA D, O’Reilly Media, Inc, 2007. 3. E. Freeman, E. Robson, Head first design patterns, 2nd Ed. O’Reilly Media, Inc, 2020	

CONTENTS OF THE MODULE		
1.	Introduction to OOP (6 hours)	LO1
	a. Procedural vs OOP b. Introduction to class, object, access modifiers	
2.	Abstraction and Encapsulation (11 hours)	LO1
	a. Concepts of Abstraction and Encapsulation b. Constructors c. Getters and setters	
3.	Identifying Classes and Objects (8 hours)	LO1
	a. Identifying classes and objects using noun and verb analysis b. CRC (Class-Responsibility-Collaborator) Cards	
4.	Relationships and Class Diagram (16 hours)	LO5
	a. Composition, Aggregation, Association, and Dependency: Understanding and implementing relationships between objects b. Inheritance: Modeling parent-child relationships and reusing code through generalization c. UML Class Diagrams: Building and analyzing diagrams to represent object-oriented designs	
5.	Advanced OOP Concepts (11 hours)	LO3
	a. Polymorphism: Using method overriding to achieve dynamic behavior in objects b. Abstract Classes: Defining abstract methods and creating abstract classes for reusable design c. Interfaces: Designing interfaces for multiple inheritance and abstraction d. Static Modifier: Understanding static variables, methods, and blocks e. Constructor Chaining: Simplify object initialization and improve code readability	
6.	Exception Handling (5 hours)	LO2
	a. Handling exceptions in Java	

7.	Strings, Generics, and Collections (5 hours)												LO4
	a. String manipulation b. Generics c. Collections												
8.	Best Practices (8 hours)												LO4
	a. SOLID principles b. Code refactoring c. Coupling and cohesion												
LEARNING OUTCOMES TO PROGRAM OUTCOMES MAPPING													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P10	P11	P12	
LO1	X												
LO2		X											
LO3	X				X	X							
LO4		X											
LO5													
Module	X	X			X	X							
PO1	Apply knowledge of mathematics, statistics, basic sciences, and computer science to solve complex problems related to the computing domain.												
PO2	Identify, formulate, and analyze complex problems related to the computing domain by using established approaches in computing while recognizing their limitations, reviewing technical literature, and interpreting the results of experiments designed using appropriate research methods.												
PO3	Design systems, processes, or services to meet desired needs within realistic constraints.												
PO4	Apply reasoning informed by contextual knowledge in the area of information technology to assess the impacts of IT solutions in a global, economic, environmental, societal, legal, cultural, and health and safety context.												
PO5	Design, implement and deploy IT solutions using industry best practices including continuous improvements, quality assurance and mitigating security risks.												
PO6	Create, select, and apply appropriate computing tools, techniques and resources necessary to solve IT related real world problems												
PO7	Apply broad knowledge of sustainable development concepts and practices required for developing a solution in the information technology domain.												
PO8	Apply ethical principles and commit to professional ethics, responsibilities, and norms in the field of Computing												
PO9	Function effectively within a multidisciplinary and multicultural team which promotes equality, diversity, and inclusion.												
PO10	Communicate on computing activities with a wide variety of audiences by means of appropriate designs, plans, reports, presentations, and instructions.												
PO11	Apply broad knowledge of management principles, commercial context, change management, relevant legal matters including intellectual property rights and risk mitigation to manage projects in a multidisciplinary context.												
PO12	Plan and record self-learning and continuous professional development as the foundation for lifelong learning.												
GENERAL INFORMATION													
Any type of plagiarism is not allowed.													

Plagiarism: Academic honesty is crucial to a student's credibility and self-esteem, and ultimately reflects the values and morals of the Institute as whole.

A student may work together with one or a group of students discussing assignment content, identifying relevant references, and debating issues relevant to the subject.

Plagiarism occurs when the work of another person, or persons, is used and presented as one's own.

END OF MODULE OUTLINE