University of Engineering and Technology Lahore - New Campus (Kala Shah Kaku)

Section Course Outline Report

Department: Computer Science (KSK) **Printed Date:** March 21, 2022

Section Course Detail	
Semester	SPRING 2022
Department	Computer Science (KSK)
Section	C
Subject Title	CS-162 Object Oriented Programming
Subject Domain	Non-Engineering
Subject Knowledge	Humanities
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Measureable Student Learning Outcomes

CLOs	Description	PLOs	Domain	Domain Level
CLO1	Explain OOP concepts like object, class, data & function members, friend functions, message, abstraction, encapsulation, protection, composition, inheritance, polymorphism	PLO01		
CLO2	Devise objects from description implementing their structure and behavior by defining data members, and member functions/operators with emphases on usability	PLO03		
CLO3	Appraise optimal static and dynamic usage of memory and protecting memory breach and wastage	PLO02		
CLO4	Interpret lifespan of objects defined as entry into, computational collaboration through messages and exit from logical spaces in computational tasks	PLO03		

Class Timings

Section Content

Week (Lec)	Topics	CLO's
week1	Functions: prototype, definition, and call. Function parameter types: in, in-out and out only, value type, reference type. Reference and pointer differentiated. Runtime code segment and data segment explained. System Heap and Stack explained.	

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Week (Lec)	**Topics**	**CLO's**
week2	Difference between non-structured programming, structured programming and Object Oriented Programming and problem solving. Where to store Structural, Behavioral and Capabilities with limitation and constraints. Object oriented approach to programming with Concepts of Object Orientation, e.g., Protection, Encapsulation, Abstraction, Messaging. Software reuse through Inheritance and Composition. Language extension view of OOP.	
week3	Migration from modular program having structures and functions to Classes & Object: syntax and semantics. Implicitly available member functions. Default constructor, copy constructor, destructor, = assignment operator, & address-of operator. Access modifiers: public, private.	
week4	Programmer defined constructor, copy constructor, destructor, assignment operator(=). Overloading constructors. Shallow and deep objects. Constructor's initializer list.	
week5	Separate declaration and definition of member functions. Accessors, utility methods, objects as argument and return type. Cascaded calls to functions;	
week6	Static members, const members, objects members; Constructor's initializer list revisited; uses of implicit this pointer/reference or me reference.	
week7	Arrow (->) operator, dynamic memory allocation with new operator to instantiate objects in the system heap and de-allocation of object memory with delete operator.	
week8	Operator Overloading: operator as member functions; operators as friend functions; Cascaded calls to operator functions; Restriction on friend operator functions [],(), ->	
week9	Composition and related concepts; Has-a relationship. Complex object. Partial classes	
week10	Composition Cont. (Association and Aggregation)	
week11	Inheritance: private and protected access modifiers. Is-a Relationship of base class and derived classes, Derived class functions overloading. Data member domination.	

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Week (Lec)	**Topics**	**CLO's**
week12	Inheritance: Member function overriding; virtual functions; pure virtual functions.	
week13	Abstract classes; Concrete classes; Class hierarchy. Multiple inheritance; Diamond head problem;	
week14	Polymorphism: how to implement; compilation advantage.	
week15	Revision	