University of Engineering and Technology Lahore

Section Course Outline Report

Department: Computer Science **Printed Date:** November 15, 2021

Section Course Detail	
Semester	FALL 2021
Department	Computer Science
Section	A
Subject Title	CS-102 Introduction to Computing
Subject Domain	Non-Engineering
Subject Knowledge	Humanities
Contact	khaldoon@uet.edu.pk

Measureable Student Learning Outcomes

CLOs	Description	PLOs	Domain	Domain Level
CLO1	The students should be able to identify real-world problems using computers.	PLO03	Cognitive	2. Understand
CLO2	Students should be able to enumerate Number Systems	PLO01	Cognitive	1. Remember
CLO3	The students should be able to describe the concepts of core subjects of computer science. For example computer architecture, software engineering, data structures, operating system, computer	PLO01	Cognitive	2. Understand

Class Timings

Grading Policy

Quiz 1 15.0
Mid-term 30.0
Quiz 2 15.0
Final 40.0

Section Content

Week (Lec)	Topics	CLO's
week1	1. Introduction to Computer Science a. Understanding “Computers” b. The Role of Algorithms c. The Science of Algorithms d. The Science of Abstraction e. An Outline of Our Study f. The History of Computing g. Breakthrough future technologies	CLO1

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Week (Lec)	**Topics**	**CLO's**
	h. Social Repercussions	
week2	2. Acknowledging the problems and their solutions in computers a. Abstraction b. Decision-Making c. Interfaces	CLO1
week3	Data Storage a. Bits and their storage i. Boolean Operations (AND, OR, XOR) ii. Gates and Flip Flops iii. Hexadecimal Notation b. Main Memory i. Introduction of Memory and its Organization ii. Memory Layout c. Mass Storage Devices	CLO2
week4	Data Storage (Continued...) d. Representing information (text, numbers) as bit patterns e. The Binary System i. Obtaining the binary representation ii. Binary system addition iii. Fractions in the Binary iv. Fraction Decimal to Fraction Binary Conversion f. Storing Integers i. Two's complement notation (Overflow) ii. Adding in two's complement notation g. Storing Fractions h. Floating-point Notation (Truncation Errors) i. File Systems	CLO2
week5	5. Acknowledging the problems and their solutions in computers a. Searching for solutions Data Manipulation a. Computer Architecture (von-Neumann Architecture) i. Central role of Control Unit (CU) ii. Networks Flexibility of Execution	CLO1, CLO2, CLO3
week6	6. Data Manipulation (Continued...) b. Machine Language i. Instruction categories (dividing/adding/subtracting values stored in memory) ii. Composition of Machine Instructions iii. Simple Machine Architecture (Decoding Instructions) c. Machine Cycle i. Decoding JUMP Instruction ii. Program Execution (with Example) d. Arithmetic Logic Instructions e. Communication with other devices	CLO2, CLO3

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Week (Lec)	**Topics**	**CLO's**
week7	7. Data Manipulation (Continued...) f. 'Von Neumann Architecture'- Problem g.'Von Neumann Architecture'- Alternatives (Pipelining, Parallel Processing)	CLO3
week8	8. Software Engineering a. Engineering Example b. Software vs. Real-world Engineering c. Large/complex software systems d. Research in Software Engineering e. The Software Life Cycle f. Software Engineering Methodologies / Trends in Software Engineering	CLO3
week9	9. Software Engineering (Continued...) g. Modularity i. Modularity in OO Systems ii. Inter-Modules Dependencies (Coupling: Control Coupling & Data Coupling, Cohesion: iii. Logical Cohesion & Functional Cohesion h. Design Methodologies i. Tools of the Trade j. Design Patterns i. Pareto Principle k. Testing l. Documentation	CLO3
week10	10. Operating Systems a. History of Operating System b. Operating System Architecture i. Software Classification ii. Components of an Operating System c. Coordinating the Machine's Activities i. The concept of a Process ii. Process Administration and Time Sharing iii. Inter-Process Communication (Client-Server Model) d. Handling Competition among Processes (Problems faced?) i. Semaphores ii. Deadlock (& its solution)	CLO3
week11	11. Networking and the Internet a. Networks i. Network History ii. Different Network Classifications (LAN, MAN, WAN, Closed v/s Open Ownership) iii. Network Topologies (Bus, Star) iv. Network Protocols (CSMA/CD, CSMA/CA) v. Combining/connecting Networks (Repeater, Bridge, Switch, Router) b. The Internet i. Internet Architecture (ISP, Access ISP) ii. Internet Composition iii. Structure of the Internet iv. Basic of IP Addressing v. Traditional Internet Applications	CLO3

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	vi. The layered Approach to Internet Software c. Mnemonic Address i. Domains and Sub-Domains ii. Domain Name Server	
week12	12. Data Abstractions (Data Structures) a. Basic Data Structures (Arrays, Lists, Stacks) b. Static vs. Dynamic Structures c. Pointers d. Implementing Data Structures e. Storing Arrays (Homogeneous Arrays) f. Storing Lists (Contiguous List, Linked List, Structure of a Linked List) g. Deleting an entry from a Linked List h. Inserting an entry into a Linked List i. Storing Stacks	CLO3
week13	13. Data Abstractions (Database Systems) a. File Structures (Files, Directories and Operating Systems) b. Files: Conceptual vs. Actual View c. Sequential Files d. Text Files e. Text files & Markup Languages (e.g. HTML) f. From actual storage to conceptual view g. Data Conversion h. Quick File Access i. Inverted Files j. Hashing (Hash Function: Example)	CLO3
week14	14. Acknowledging the problems and their solutions in computers a. Search Engines b. Crawling the Web	CLO1
week15	15. Acknowledging the problems and their solutions in computers a. Searching the Whole World b. Searching with Sherlock Holmes Search Engine c. Many Words at Once d. Exact Phrases	CLO1
week16	16. Acknowledging the problems and their solutions in computers a. Searching with Logic b. Search Challenges c. Introducing Indexes d. Building an Index e. An Algorithm for Indexing f. Word Search with an Index g. Queries With AND and OR Operators	CLO1