BUDHA DAL PUBLIC SCHOOL, PATIALA

LESSON PLAN OF CLASS XI (SUBJECT: INFORMATICS PRACTICES 065)
Term –I & Final Exams Syllabus (Session 2024-25)

Term – 1

Unit 1: Introduction to Computer System
- Introduction to computer and computing: evolution of computing devices, components of a computer system and their interconnections, Input/output devices.
- Computer Memory: Units of memory, types of memory – primary and secondary, data deletion, its recovery and related security concerns.
- Software: purpose and types – system and application software, generic and specific purpose software.

Unit 2: Introduction to Python
- Basics of Python programming, Python interpreter - interactive and script mode, the structure of a program, indentation, identifiers, keywords, constants, variables, types of operators, precedence of operators, data types, mutable and immutable data types, statements, expressions, evaluation and comments, input and output statements, data type conversion, debugging.
- Control Statements: if-else, if-elif-else, while loop, for loop
- Lists: list operations - creating, initializing, traversing and manipulating lists, list methods and built-in functions – len(),list(),append(),insert(), count(),index(),remove(), pop(), reverse(), sort(), min(),max(),sum()
- Dictionary: concept of key-value pair, creating, initializing, traversing, updating and deleting elements, dictionary methods and built-in functions – dict(), len(), keys(), values(), items(), update(), del(), clear()

Term – 2

Unit 3: Database concepts and the Structured Query Language
- Database Concepts: Introduction to database concepts and its need, Database Management System.
- Relational data model: Concept of domain, tuple, relation, candidate key, primary key, alternate key

- Advantages of using Structured Query Language, Data Definition Language, Data Query Language and Data Manipulation Language, Introduction to MySQL, creating a database using MySQL, Data Types
- Data Definition: CREATE DATABASE, CREATE TABLE, DROP, ALTER
- Data Query: SELECT, FROM, WHERE with relational operators, BETWEEN, logical operators, IS NULL, IS NOT NULL
- Data Manipulation: INSERT, DELETE,UPDATE

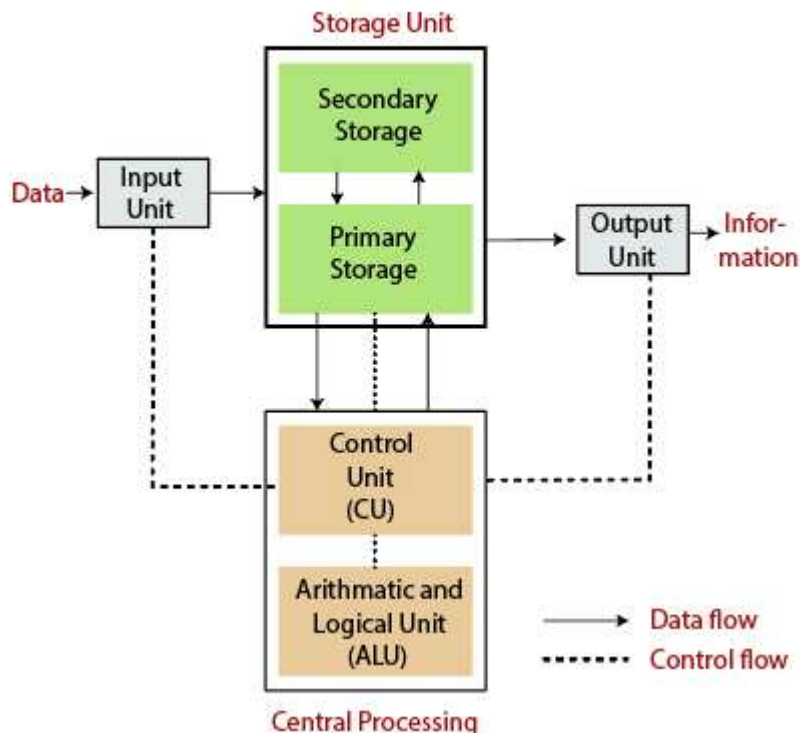## Unit 4: Introduction to the Emerging Trends
- Artificial Intelligence, Machine Learning, Natural Language Processing, Immersive experience (AR, VR), Robotics, Big data and its characteristics, Internet of Things (IoT), Sensors, Smart cities, Cloud Computing and Cloud Services (SaaS, IaaS, PaaS); Grid Computing, Block chain technology.

<mark>Month wise Distribution</mark>

April

## Unit 1: Introduction to Computer System

Block diagram of Computer

Storage Unit
- Secondary Storage
- Primary Storage

Data → Input Unit

Output Unit → Information

Central Processing
- Control Unit (CU)
- Arithmatic and Logical Unit (ALU)

→ Data flow
···· Control flow

- Introduction to computer and computing: evolution of computing devices, components of a computer system and their interconnections, Input/output devices.
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May

Unit 2: Introduction to Python
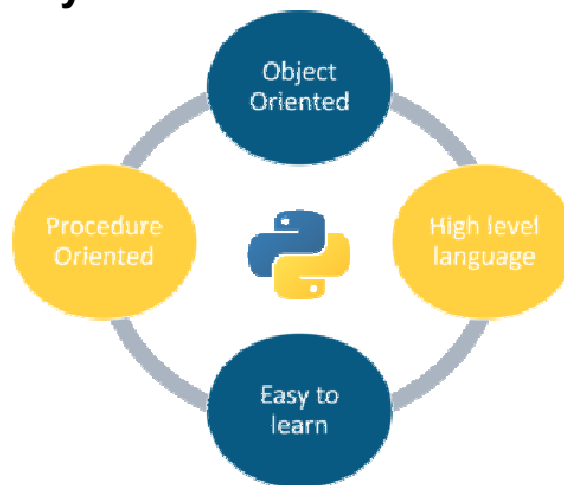
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- Control Statements: if-else, if-elif-else, while loop, for loop

July

- Lists: list operations - creating, initializing, traversing and manipulating lists, list methods and built-in functions – len(),list(),append(),insert(), count(),index(),remove(), pop(), reverse(), sort(), min(),max(),sum()
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August

Unit 3: Database concepts and the Structured Query Language

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September

First Term Exams

October

Unit 4: Introduction to the Emerging Trends

Artificial Intelligence, Machine Learning, Natural Language Processing, Immersive experience (AR, VR), Robotics, Big data and its characteristics, Internet of Things (IoT), Sensors, Smart cities, Cloud Computing and Cloud Services (SaaS, IaaS, PaaS); Grid Computing, Block chain technology.

Term –I

April – Unit 1: Introduction to Computer System

Topics:

- Introduction to computer and computing: evolution of computing devices, components of a computer system and their interconnections, Input/output devices.
- Computer Memory: Units of memory, types of memory – primary and secondary, data deletion, its recovery and related security concerns.
- Software: purpose and types – system and application software, generic and specific purpose software.

Learning Objectives:

- Understand the evolution and components of computing devices.
- Identify and describe different types of computer memory.
- Explain the purpose and types of software.

Activities/Projects:

- Hands-on activities to identify components of a computer system.
- Demonstration and practical exercises on primary and secondary memory.
- Software installation and usage demonstrations.

Expected Learning Outcomes:

- Students will grasp the evolution and components of computing devices.
- They will differentiate between primary and secondary memory and understand their implications.
- Students will classify software based on its purpose and functionality.

Assessment:

- Quizzes on computer components and memory types.

- Practical tests on software installation and usage.

<mark>May – Unit 2: Introduction to Python</mark>

Topics:

- Basics of Python programming, Python interpreter - interactive and script mode, the structure of a program, indentation, identifiers, keywords, constants, variables, types of operators, precedence of operators, data types, mutable and immutable data types, statements, expressions, evaluation and comments, input and output statements, data type conversion, debugging.
- Control Statements: if-else, if-elif-else, while loop, for loop.

Learning Objectives:

- Learn the basics of Python programming language.
- Understand Python interpreter modes and program structure.
- Master control statements and their usage in Python.

Activities/Projects:

- Hands-on coding exercises to practice Python syntax and control statements.
- Debugging sessions to identify and fix common programming errors.
- Small projects to demonstrate use cases of control statements in Python.

Expected Learning Outcomes:

- Students will be proficient in basic Python syntax and programming concepts.
- They will apply control statements effectively to solve programming problems.

- Students will debug Python programs and enhance their coding skills.

Assessment:

- Coding assignments on Python syntax and control statements.
- Coding tests and debugging exercises.

July – Lists and Dictionary

List in Python PYnative.com

L = [20, 'Jessa', 35.75, [30, 60, 90]]

L[0]   L[1]   L[2]   L[3]

✓ **Ordered**: Maintain the order of the data insertion.
✓ **Changeable**: List is mutable and we can modify items.
✓ **Heterogeneous**: List can contain data of different types
✓ **Contains duplicate**: Allows duplicates data

Dictionary in Python PYnative.com
Unordered collections of unique values stored in (Key-Value) pairs.

d = {'a': 10, 'b': 20, 'c': 30}

d['a']   d['b']   d['c']

✓ **Unordered**: The items in dict are stored without any index value
✓ **Unique**: Keys in dictionaries should be Unique
✓ **Mutable**: We can add/Modify/Remove key-value after the creation

Topics:

- Lists: list operations - creating, initializing, traversing and manipulating lists, list methods and built-in functions – len(), list(), append(), insert(), count(), index(), remove(), pop(), reverse(), sort(), min(), max(), sum().

- Dictionary: concept of key-value pair, creating, initializing, traversing, updating and deleting elements, dictionary methods and built-in functions – dict(), len(), keys(), values(), items(), update(), del(), clear().

Learning Objectives:

- Understand lists and their operations in Python.
- Master dictionary operations and methods.
- Apply lists and dictionaries to solve programming problems.

Activities/Projects:

- Coding exercises to practice list and dictionary operations.
- Projects to implement algorithms using lists and dictionaries.
- Problem-solving tasks using lists and dictionaries.

Expected Learning Outcomes:

- Students will be proficient in using lists for data manipulation.
- They will apply dictionary operations to store and retrieve data efficiently.
- Students will use lists and dictionaries effectively in algorithmic solutions.

Assessment:

- Coding assignments on lists and dictionary operations.
- Problem-solving tasks and projects.

August – Unit 3: Database Concepts and SQL
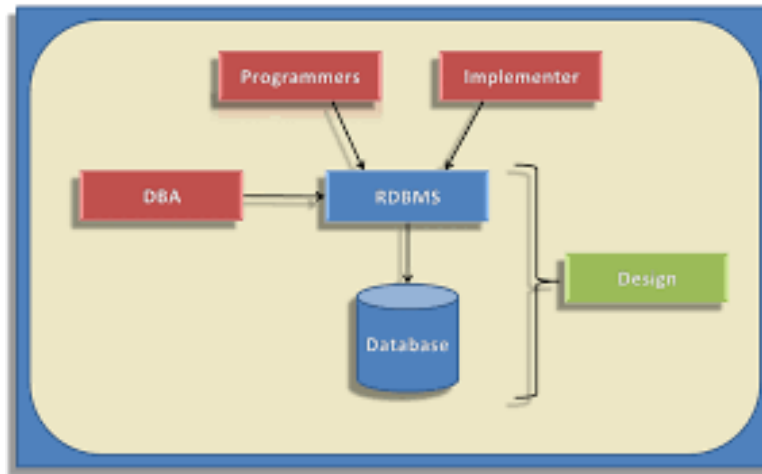
Topics:

- Database Concepts: Introduction to database concepts and its need, Database Management System.
- Relational data model: Concept of domain, tuple, relation, candidate key, primary key, alternate key.
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- Data Definition: CREATE DATABASE, CREATE TABLE, DROP, ALTER.
- Data Query: SELECT, FROM, WHERE with relational operators, BETWEEN, logical operators, IS NULL, IS NOT NULL.
- Data Manipulation: INSERT, DELETE, UPDATE.

Learning Objectives:

- Understand fundamental database concepts and relational data model.
- Learn SQL and its components: DDL, DQL, DML.
- Practice creating and querying databases using MySQL.

Activities/Projects:

- Database design projects to practice data modeling and normalization.
- SQL queries exercises to retrieve and manipulate data.
- Practical sessions on MySQL database management.

Expected Learning Outcomes:

- Students will comprehend database concepts and relational data models.
- They will write SQL queries to perform data operations effectively.
- Students will create and manage databases using MySQL.

Assessment:

- Database design projects and SQL query assignments.
- Practical tests on MySQL database management.

October – Unit 4: Introduction to Emerging Trends

Topics:

- Artificial Intelligence, Machine Learning, Natural Language Processing.
- Immersive experience (AR, VR), Robotics.
- Big data and its characteristics, Internet of Things (IoT), Sensors, Smart cities.
- Cloud Computing and Cloud Services (SaaS, IaaS, PaaS); Grid Computing, Blockchain technology.

Learning Objectives:

- Explore emerging technologies and their applications.
- Understand the impact of AI, IoT, and big data on modern society.
- Learn about cloud computing models and blockchain technology.

Activities/Projects:

- Research projects on AI, IoT, and cloud computing.
- Case studies on real-world applications of emerging technologies.
- Demonstrations and simulations of AR, VR, and robotics.

Expected Learning Outcomes:

- Students will gain insight into emerging technologies and their significance.
- They will analyze the impact of AI, IoT, and big data on various industries.
- Students will understand the principles and applications of cloud computing and blockchain.

Assessment:

- Research papers and presentations on emerging technologies.
- Case study analysis and project demonstrations.

This structured lesson plan should help in effectively organizing and delivering lessons from April to October, covering essential topics in computer systems, programming, databases, and emerging technologies.

November
Practical's

December & January

Revision

February

Final Exams