Informatics Practices
CLASS XI
Code No. 065
2021-22

1. **Prerequisite** : None

2. **Learning Outcomes** :
   At the end of this course, students will be able to:
   - Identify the components of the Computer System.
   - Create Python programs using different data types, lists and dictionaries.
   - Explain database concepts and Relational Database Management Systems.
   - Retrieve and manipulate data in RDBMS using Structured Query Language
   - Identify the Emerging trends in the fields of Information Technology.

3. **Distribution of Marks and Periods**

Unit No	Unit Name	Marks	Periods Theory	Periods Practical	Total Period
1	Introduction to computer system	10	10	-	10
2	Introduction to Python	25	35	28	63
3	Database concepts and the Structured Query Language	30	23	17	40
4	Introduction to Emerging Trends	5	7	-	7
	Practical	30	-	-	-
	Total	100	75	45	120

TERM - 1

Distribution of Theory Marks

Unit No	Unit Name	Marks
1	Introduction to computer system	10
2	Introduction to Python	25
	Total	35

Unit Wise syllabus

Unit 1:
Introduction to Computer System
- Introduction to computers 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 of expressions, comments, input and output statements, data type conversion, debugging,

- Control statements: if-else, for loop.

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

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

Distribution of Practical Marks

Topic	Marks
Python program (pen and paper or Collab or any online idle or pyroid screen for mobile)	10
Practical File- 15 python Programs	3
Viva	2
Total	15

Suggested Practical List

Programming in Python

1. To find average and grade for given marks.

2. To find the sale price of an item with a given cost and discount (%).
3. To calculate perimeter/circumference and area of shapes such as triangle, rectangle, square and circle.
4. To calculate Simple and Compound interest.
5. To calculate profit-loss for a given Cost and Sell Price.
6. To calculate EMI for Amount, Period and Interest.
7. To calculate tax - GST / Income Tax.
8. To find the largest and smallest numbers in a list.
9. To find the third largest/smallest number in a list.
10. To find the sum of squares of the first 100 natural numbers.
11. To print the first 'n' multiples of a given number.
12. To count the number of vowels in a user entered string.
13. To print the words starting with a particular alphabet in a user entered string.
14. To print the number of occurrences of a given alphabet in a given string.
15. Create a dictionary to store names of states and their capitals.
16. Create a dictionary of students to store names and marks obtained in 5 subjects.
17. To print the highest and lowest values in the dictionary.

TERM - 2

Distribution of Theory Marks

Unit No	Unit Name	Marks
3	Database concepts and the Structured Query Language	30
4	Introduction to Emerging Trends	5
	Total	35

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 attribute, domain, tuple, relation, candidate key, primary key, alternate key, foreign key.

- Structured Query Language: Data Definition Language, Data Query Language and Data Manipulation Language, Introduction to MySQL: Creating a database, using database, showing tables using MySQL,

- Data Types : char, varchar, int, float, date.

- Data Definition Commands: CREATE, DROP, ALTER (Add and Remove primary key, attribute). Data Query Commands: SELECT-FROM- WHERE, LIKE, BETWEEN, IN, ORDER BY, using arithmetic, logical, relational operators and NULL values in queries, Distinct clause Data Manipulation Commands: INSERT, UPDATE, DELETE.

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.

Distribution of Practical Marks

Topic	Marks
SQL Queries (pen and paper)	8
Practical File SQL Queries - 20 Queries	4
Viva	3
Total	15

Suggested Practical List :

Data Management: SQL Commands

1. To create a database
2. To create a student table with the student id, class, section, gender, name, dob, and marks as attributes where the student id is the primary key.
3. To insert the details of at least 10 students in the above table.
4. To delete the details of a particular student in the above table.
5. To increase marks by 5% for those students who have Rno more than 20.
6. To display the entire content of the table.
7. To display Rno, Name and Marks of those students who are scoring marks more than 50.
8. To find the average of marks from the student table.
9. To find the number of students, who are from section 'A'.
10. To add a new column email in the above table with appropriate data type.
11. To add the email ids of each student in the previously created email column.
12. To display the information of all the students, whose name starts with 'AN' (Examples: ANAND, ANGAD,..)
13. To display Rno, Name, DOB of those students who are born between '2005- 01-01' and '2005-12-31'.
14. To display Rno, Name, DOB, Marks, Email of those male students in ascending order of their names.
15. To display Rno, Gender, Name, DOB, Marks, Email in descending order of their marks.
16. To display the unique section available in the table.

Reference:
NCERT Informatics Practices - Text book for class - XI (ISBN- 978-93-5292-148-5)