

Wks Mapped with the course

WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9
*	*	*	*	*	*	*	*	

Mark Distribution:

Total Marks	CIE Marks	ESE Marks	ESE Duration
100	40	60	2.5 hrs

Continuous Internal Evaluation Pattern:

Attendance	: 5 marks
Continuous Assessment Test	: 20 marks
Continuous Assessment Assignment	: 15 marks

SYLLABUS**Module 1 (14 hrs)**

Overview of Database Systems. File System vs DBMS (advantages and limitations). DBMS Architecture (Three-Level). Relational Model Basics. SQL Overview: DDL & DML, UPDATE, DELETE. Constraints (Primary Key, Foreign Key, Unique, Not Null). Aggregate Functions and GROUP BY. Introduction to Transactions (ACID properties).

Module 2 (14 hrs)

Introduction to Database Connectivity in Python. Need for database connectivity. DB-API concepts. Working with SQLite using Python. Connecting to database using sqlite3. Creating tables using Python. Executing SQL queries through Python. Performing CRUD operations (Create, Read, Update, Delete). Parameterized Queries, Commit and Rollback, Handling Exceptions, Cursor Objects.

Module 3 (14 hrs)

CRUD Operations using Python. Batch Processing. Stored Procedures (Introduction). Transactions and Error Handling. Object Relational Mapping (ORM) – Introduction. Introduction to SQLAlchemy. Data Validation. Security Practices (SQL Injection Prevention).

Module 4 (14 hrs)

Introduction to Web Frameworks. Database Integration using Flask. Connecting Flask with MySQL/SQLite. Templates and Forms. CRUD Web Application Development. REST API Basics (Introduction Only). Deployment Basics (Overview).

Text Books:

1. Matthes, E. (2019). Python crash course: A hands-on, project-based introduction to programming (2nd ed.). No Starch Press.
2. Lutz, M. (2013). Learning Python (5th ed.). O'Reilly Media.
3. Beaulieu, A. (2020). Learning SQL: Generate, manipulate, and retrieve data (3rd ed.). O'Reilly Media.

Reference Books:

1. Beazley, D. M., & Jones, B. K. (2013). Python cookbook (3rd ed.). O'Reilly Media.
2. Downey, A. B. (2015). Think Python: How to think like a computer scientist (2nd ed.). O'Reilly Media.
3. Srinivasan, S. (2017). Python database programming with MySQL. Packet Publishing.

END SEMESTER EXAMINATION – MODEL QUESTION PAPER

Course Code	25MAMT402
Course Name	DATABASE PROGRAMMING WITH PYTHON
Max. Marks: 60	Duration: 2.5 Hours

Part A (Answer all questions. Each question carries 3 marks)				
Qn No	Question	Marks	CO	BL
1.	Compare File System and DBMS. Explain the three-level DBMS architecture.	3	CO1	L2
2.	Explain SQL constraints: Primary Key, Foreign Key, Unique, and Not Null with examples.	3	CO1	L3
3.	Explain how Python connects to SQLite database using sqlite3. Write a Python code snippet to create a table.	3	CO2	L3
4.	Describe CRUD operations in Python with SQLite. Explain parameterized queries.	3	CO2	L2
5.	Explain Object Relational Mapping (ORM) with an introduction to SQLAlchemy.	3	CO3	L2
6.	Describe SQL injection and explain how to prevent it in Python database applications.	3	CO3	L2
7.	Explain how Flask integrates with a database. Write a Flask route to fetch all records from a database.	3	CO4	L3
8.	Describe REST API basics and explain the concept of	3	CO4	L2

	deployment in web applications.			
Part B (Answer any one full question from each Module. Each carry 9 marks)				
Qn No.	Question	Marks	CO	BL
Module I				

9.1	Explain the relational model basics and SQL DDL and DML commands with examples.	5	CO1	L2
9.2	Describe aggregate functions, GROUP BY clause, and ACID properties of transactions with examples.	4	CO1	L3
OR				
10	Explain the DBMS architecture and the relational model. Write SQL queries to create tables with constraints and perform data manipulation operations.	9	CO1	L3
Module II				
11.1	Explain DB-API concepts in Python. Describe how to connect to SQLite using Python and perform CRUD operations.	5	CO2	L3
11.2	Describe commit and rollback operations in Python. Explain handling exceptions using cursor objects.	4	CO2	L2
OR				
12	Write a complete Python program using sqlite3 to implement a student management system with create, read, update, and delete operations using parameterized queries.	9	CO2	L3
Module III				
13	Explain transaction management and error handling in Python database applications. Describe ORM introduction using SQLAlchemy with an example.	9	CO3	L2
OR				
14.1	Explain batch processing and stored procedures in Python database programming.	5	CO3	L2
14.2	Describe data validation and security practices including SQL injection prevention.	4	CO3	L3
Module IV				
15.1	Explain database integration using Flask. Describe how to connect Flask with MySQL/SQLite using templates and forms.	5	CO4	L3
15.2	Describe the development of a CRUD web application using Flask with database connectivity.	4	CO4	L3
OR				
16	Develop a complete database-driven web application using Flask and SQLite covering CRUD operations, templates, forms, and basic REST API concepts.	9	CO4	L3