

**Anekant Education Society's
Tuljaram Chaturchand College of Arts, Sci. & Commerce,
Baramati
(Autonomous)**

**F.Y.B.Sc.(Computer Science)
(Semester – II)**

**Syllabus
(2022 Pattern)**

Academic Year 2022-2023

Subject: Computer Science

Prerequisites:

1. Problem Solving tools like algorithms, flowcharts and pseudocodes.
2. Basic knowledge of 'C' language.

Course Objectives:

Students successfully completing this course will be able:

1. To study advanced concepts of programming using 'C' language.
2. To understand complex data types like structure and union.
3. To work with files.
4. To understand and develop basics of Graphics Programming

Course Outcomes:

On completion of this course, students will be able to:

1. Develop programs using control structures, pointers, strings, structures and files in 'C'.
2. Design and develop solutions to real world problems using C.

	Chapter and Sub Topics	No. of Lectures
Unit – I	Pointers 1.1 Pointer declaration, initialization 1.2 Dereferencing pointers 1.3 Pointer arithmetic 1.4 Pointer to pointer 1.5 Arrays and pointers 1.6 Functions and pointers – passing pointers to functions, function returning pointers 1.7 Dynamic memory allocation	8
Unit – II	Strings 2.1 Declaration and initialization, format specifiers 2.2 Standard library functions 2.3 Strings and pointers 2.4 Array of strings 2.5 Command Line Arguments	6
Unit – III	Structures and Unions 3.1 Creating structures 3.2 Accessing structure members (dot Operator) 3.3 Structure initialization 3.4 Typedef 3.5 Array of structures 3.6 Passing structures to functions 3.7 Nested structures 3.8 Pointers and structures	10

	3.9 Self-referential structure 3.10 Unions 3.11 Difference between structures and unions	
Unit – IV	File Handling 4.1 Streams 4.2 Types of Files 4.3 Operations on files 4.4 Random access to files	6
Unit – V	C Pre-processor 4.1 Format of Pre-processor directive 4.2 File Inclusion directive 4.3 Macro substitution, nested macro, argumented macro 4.4 Macros VS Functions	2
Unit – VI	Graphics programming using C 6.1 Graphics driver and mode 6.2 Drawing simple graphical objects–line, circle, rectangle etc. 6.3 Outputting text, curves & Polygons	4

Books References:

1. Yashavant Kanetkar : Let Us C 7th Edition, PBP Publications
2. E Balaguruswamy : Programming in ANSI C 7th Edition, Tata Mc-Graw Hill Publishing Co. Ltd.-New Delhi
3. Brian W. Kernighan and Dennis M. Ritchie : The C Programming Language 2nd Edition, Prentice Hall Publication
4. The Complete Reference to C, Herbert Schildt
5. Problem Solving with C, Harrow
6. Programming in C ,A Practical Approach, Ajay Mittal , Pearson

Web References:

1. <https://www.tutorialspoint.com/cprogramming/index.htm>
2. <https://www.w3schools.com/c/index.php>
3. <https://www.guru99.com/c-programming-tutorial.html>
4. <https://www.geeksforgeeks.org/c-programming-language/>
5. <https://nptel.ac.in/courses>

Class: F.Y. B. Sc. (Computer Science) (Semester- II)**Subject:** Computer Science**Paper Code:** UCSCO122**Title of Paper:** DBMS-II**Paper:** II**Credit:** 2**No. of lectures:** 36**Prerequisites:** Knowledge of DBMS**Learning Objectives:** -Students successfully completing this course will be able to:

- Understand fundamental concepts of RDBMS (PL/PgSQL)
- Understand data security and its importance.
- Understand client server architecture.

Learning Outcomes:

- Develop the database design by normalization.
- Knowing functional dependencies and design of the relational database.
- Design concept of Transaction and Query processing.




Unit	Title & Content	No. of lecture
Unit I	<p style="text-align: center;">1. RELATIONAL DATABASE CONCEPT</p> 1.1 Normalization (1NF,2NF,3NF, BCNF,4NF, 5 NF) 1.2 Controlling the program flow, conditional statements, loops 1.3 Views	6
Unit-II	<p style="text-align: center;">2. PL/pgSQL</p> 2.1 Stored Function 2.2 Stored Procedure 2.3 Cursors 2.4 Handling errors and exceptions 2.5 Triggers	10
Unit III	<p style="text-align: center;">3 TRANSACTION CONCEPTS AND CONCURRENCY CONTROL</p> 2.1 Transaction, properties of transaction, state of the transaction. 2.2 Executing transactions concurrently associated problem in concurrent execution. 2.3 Schedules, types of schedules, Serializability, precedence graph for Serializability. 2.4 Ensuring Serializability by locks, different lock modes, 2PL and its variations. 2.5 Basic timestamp method for concurrency, Thomas Write Rule. 2.6 Locks with multiple granularities 2.7 Timestamps versus locking.	10

	<p>2.8 Deadlock handling methods</p> <p>2.8.1 Detection and Recovery (Wait for graph).</p> <p>2.8.2 Prevention algorithms (Wound-wait, Wait-die)</p>	
Unit IV	<p>4 DATABASE INTEGRITY AND SECURITY CONCEPTS</p> <p>3.1 Domain constraints</p> <p>3.2 Referential Integrity</p> <p>3.3 Introduction to database security concepts</p> <p>3.4 Methods for database security</p> <p>3.4.1 Discretionary access control method</p> <p>3.4.2 Mandatory access control and role base access control for multilevel security.</p> <p>3.5 Use of views in security enforcement.</p>	04
Unit V	<p>5 CRASH RECOVERY</p> <p>4.1 Failure classification</p> <p>4.2 Recovery concepts</p> <p>4.3 Log base recovery techniques (Deferred and Immediate update)</p> <p>4.4 Checkpoint</p> <p>4.5 Recovery with concurrent transactions (Rollback, checkpoints, commit)</p> <p>4.6 Database backup and recovery from catastrophic failure.</p> <p>4.7 DCL Command implementation with example (Grant & Revoke Command)</p>	04
Unit VI	<p>6. INTRODUCTION OF RESENT DATABASE TECHNOLOGIES</p> <p>6.1 Structured Database: RDBMS Databases</p> <p>6.2 Unstructured Database: NOSQL Databases</p> <p>6.3 Examples</p>	02

References: -

1. Fundamentals of Database Systems (4th Ed) By: Elmasri and Navathe
2. Database System Concepts (4th Ed) By: Korth, Sudarshan, Silberschatz
3. Practical PostgreSQL O'REILLY
4. Beginning Databases with PostgreSQL, From Novice to Professional, 2nd Edition By Richard Stones, Neil Matthew, Apress

RDBMS SEM-II INTERNAL ASSIGNMENT SUBMISSION ON

-  Normalization of DB (3 Assignments)
-  Schedules (3 Assignment)
-  Dead lock Detection and recovery (4 Assignments)

Class- F.Y.B.Sc.(C.S.) Sem-II
Title of Paper- Advanced Programming Using C
No. of Credit-02

Paper code- UCSCO123
Paper-III
No. of Practicals-12

Course Objectives:

Students successfully completing this course will be able to:

1. Design and implement a real-world computational problem using Advanced 'C' programming concepts.
2. Understand appropriate use of data types like structures, Union
3. Understand use of Files

Course Outcomes:

On completion of this course, students will be able to:

1. Write, debug and execute programs using advanced concepts in 'C'.
2. To understand the advanced concepts of programming.

Guidelines:

Lab Book: The lab book is to be used as a hands-on resource, reference and record of assignment submission and completion by the student. The lab book contains the set of assignments which the student must complete as a part of this course.

Submission: Problem Solving Assignments: The problem solving assignments are to be submitted by the student in the form of a journal containing individual assignment sheets. Each assignment includes the Assignment Title, Problem statement, Date of submission, Assessment date, Assessment grade and instructors sign.

Assessment:

Continuous assessment of laboratory work is to be done based on overall performance and lab assignments performance of student.

Operating Environment:

For 'C' Programming:

- Turbo C++ 4.0 Windows 7 Windows 8 64Bit Version

	Title of Experiment/ Practical
1	Assignment to demonstrate use of pointers.
2	Assignment to demonstrate concept of strings (string & pointers)
3	Assignment to demonstrate array of strings.
4	Assignment to demonstrate use of bitwise operators.
5	Assignment to demonstrate structures and unions.
6	Assignment to demonstrate structures (using array and functions).
7	Assignment to demonstrate command line arguments and pre-processor directives.
8	Assignment to demonstrate file handling (text files & binary files)
9	Assignment to demonstrate graphics programming.
10	Activity 10.1-Based on structures Activity 10.2-Based on pointers
11	Activity 11.1-Based on File handling concepts Activity 11.-Based on Graphics

*Activity submission will be considered for internal evaluation for each student.

Class: F.Y. B. Sc. (Comp. Sci.) (Semester- II)

Subject: Computer Science

Paper Code: UCSCO124

Title of Paper: Lab Course on DBMS-II

Paper: IV

Credit: 2

No. of Practical's: 12

Learning objective: Students successfully completing this course will be able to:

- Understand design and implementation of a database system.
- Study the physical, logical database designs and database modeling.
- Understanding and development for essential RDBMS concepts.
- Understand creations, manipulation and querying of data in databases.

Learning Outcomes:

- Outline the fundamental concepts of relational Database Management System.
- Perform advanced Relational database Management Operations.
- Validate the queries by implementing error and exception handling techniques.
- Write queries, functions, triggers, cursor, and views using SQL and PL/SQL.

Sr. No.	Title of Experiment/ Practical
1.	Simple Queries
2.	Nested Queries, using aggregate functions
3.	Queries using Views
4.	Stored Function
5.	Cursors
6.	Exception Handling
7.	Triggers
8.	Activity -1 (ER, & Normalization)
9.	Activity -2 (ER, & Normalization)
10.	Case Studies (2)