

COURSE DESCRIPTION			
Program	Computer Application & Business Management		
Course Title	C Programming Lab		
Course Code	2258	Semester	II
Type of Course	Lab	Contact Hours	45
Teaching Scheme (L: T:P:R)	0:0:3:0	Credits	1.5
CIE Marks	60	ESE Marks	40

Introduction

The course is designed to provide hands-on experience in writing, compiling, and debugging programs in the C programming language. The lab helps students understand fundamental programming concepts and develop problem-solving skills using C

Course Objectives

1	To develop problem-solving skills using C programming
2	To understand and implement fundamental concepts like data types, control structures, functions, arrays, pointers, and file handling
3	To design, write, compile, and debug C programs
4	To lay foundation for further courses like Data Structure, Object Oriented Programming, and software development

Course Pre-requisite

Topic	Course code	Course Title	Semester
Basic programming concepts	1259	Introduction to Python Lab	I

Course Outcome

CO	Course Outcome	Blooms Taxonomy Level
CO1	Demonstrate sequential and control structures in C with simple problems	Apply
CO2	Use one- and two-dimensional arrays in C to solve problems	Apply
CO3	Apply the concepts – functions, storage classes and recursion to solve problems.	Apply
CO4	Make use of Pointers and structures to solve real world problems effectively.	Apply

CO-PO mapping

COURSE ARTICULATION MATRIX											
Course Outcomes	PROGRAM OUTCOMES										
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	-	-	3	-	-	-	-	-	2
CO2	3	3	2	2	3	-	-	-	-	-	2
CO3	3	3	22	2	3	-	-	-	-	-	2
CO4	3	3	3	2	3	-	-	-	-	-	2
Total	12	11	7	6	12	-	-	-	-	-	8
Correlation Level	3	2.75	2.33	2	3	-	-	-	-	-	2

Legends: 1 - Low; 2 - Medium; 3 - High; No Correlation - "-"

Teaching and Assessment Scheme

Teaching Scheme/Week				Self-learning (SS)/Week	Total Hours/Semester	Credits C	Examination Scheme						
							Theory			Practical			Total
L	T	P	S				CIE	ESE	Total	CIE	ESE	Total	
0	0	3	0	1.5	45	1.5				60	40	100	100

L: Lecture (One unit is of one-hour duration with one credit), T: Tutorial (One unit is of one-hour duration with one credit), P: Practical (One unit is of one-hour duration with 0.5 credit), S: Project (One unit is of one-hour duration with 0.5 credit) SS: Self-Learning, CIE: Continuous Internal Evaluation, ESE: End Semester Examination

Detailed Syllabus

Expt No.	Experiment name	Practical Outcome	Mapped CO	Taxonomy Level	Instructional Hours
Module I					
1	Sequential Control Structure	Identify the statements in a C program and execute line by line in the order they are written.	CO1	Apply	3
2	Selection Control Structure	Develop simple C programs using decision control structures in C	CO1	Apply	3
3	Iteration Control Structure	Implement C Programs using loop control structures.	CO1	Apply	3
4	Control Transfer Statement (break)	Use the break statement to immediately terminate a loop.	CO1	Apply	3
Module II					
5	One dimensional arrays	Develop C program to solve problems using one dimensional arrays - (like average of n nos, prime nos in a list, largest number, second largest etc)	CO2	Apply	3
6	Linear search and bubble sort	Implement linear search and bubble sort algorithms in C.	CO2	Apply	3
7	Two dimensional arrays	Develop C programs to solve problems using two dimensional arrays - (like matrix operations)	CO2	Apply	3
8	Strings	Implement C programs using strings	CO2	Apply	3
	Series Exam - I		CO1	Remember	
Module III					
9	User defined functions and recursion	Implement C programs using user defined functions and recursion	CO3	Apply	3
10	Binary search and quick sort	Develop binary search and quick sort algorithms using recursion.	CO3	Apply	3
Module IV					
11	Pointers	Develop programs using pointers.	CO4	Apply	3
12	Passing pointers to functions	Implement programs by passing arrays as pointers to functions	CO4	Apply	3
13	Structures	Develop programs in C using structures	CO4	Apply	3
	Open Ended Experiment		CO4	Apply	3
	Series Exam - II		CO4	Apply	3

Open-ended experiment**Objective:**

To encourage creativity, innovation, and application of knowledge by allowing students to design and perform an experiment beyond the prescribed list, using the concepts learned during the course.

Description:

At the end of the laboratory course, each student (or group of students) shall undertake one open-ended experiment. In this activity, students are expected to conceive, design, and implement an experiment of their own choice related to the course outcomes. The aim is to apply theoretical knowledge and laboratory skills to a new or practical problem not explicitly covered in the regular experiments.

Students may choose to:

Modify or extend an existing experiment to explore additional parameters or behaviors.
 Integrate multiple concepts from the syllabus into a combined application.
 Design a mini-setup or prototype to demonstrate a principle or solve a simple engineering problem.
 Perform a comparative study or performance analysis of a circuit/system/component.

Student Activities for Self-Learning

Week	Self-Learning description	Hours
Module I		
1	Rough record related contents preparation for Exp:1 Noting and Writing down in the fair record the procedure and result of Exp 1	1.5
2	Rough record related contents preparation for Exp:1 Noting and Writing down in the fair record the procedure and result of Exp 2	1.5

3	Rough record related contents preparation for Exp:3 Noting and Writing down in the fair record the procedure and result of Exp 3	1.5
4	Rough record related contents preparation for Exp:4 Noting and Writing down in the fair record the procedure and result of Exp 4	1.5
Module II		
5	Rough record related contents preparation for Exp:5 Noting and Writing down in the fair record the procedure and result of Exp 5	1.5
6	Rough record related contents preparation for Exp:6 Noting and Writing down in the fair record the procedure and result of Exp 6	1.5
7	Rough record related contents preparation for Exp:7 Noting and Writing down in the fair record the procedure and result of Exp 7	1.5
8	Preparations for First series Lab Examination	1.5
Module III		
9	Rough record related contents preparation for Exp:9&10 Noting and Writing down in the fair record the procedure and result of Exp 9&10	1.5
10	Rough record related contents preparation for Exp:11 Noting and Writing down in the fair record the procedure and result of Exp 11	1.5
11	Rough record related contents preparation for Exp:12 Noting and Writing down in the fair record the procedure and result of Exp 12	1.5
12	Rough record related contents preparation for Exp:13 Noting and Writing down in the fair record the procedure and result of Exp 13	1.5
Module IV		
13	Rough record related contents preparation for Exp:14 Noting and Writing down in the fair record the procedure and result of Exp 14	1.5
14	Activities related to Open ended experiments	1.5
15	Preparation for Second Series Examination	1.5
Total Self-Learning hours		22.5

Learning Resources

TEXT BOOK			
Sl. No.	Title	Author	Publication
1	Programming in ANSI C	Balagurusamy E	7thEdn, McGraw Hil
2	The Complete Reference	Herbert Schild	McGraw Hill, 4th Edition, 2002

REFERENCE			
Sl. No.	Title	Author	Publication
1	Let Us C	YashavantKanetkar	8th edition, Pearson
2	The C Programming Language	Brian W. Kernighan,	Prentice Hall of India, 2nd Edition

WEB RESOURCES		
Sl. No.	URL	Modules Covered
1	https://nptel.ac.in/courses/106104128/	All
2	Prentice Hall of India, 2nd Edition	All

Major Equipment/Instruments/Components required for a batch of 30 students

Sl. No.	Particulars	Specifications	Quantity
1	Desktops/Laptops	Basic	30

Major Software required for a batch of 30 students

Sl. No.	Particulars	Specifications	Quantity
1	IDE + GCC Compiler combo	Latest version	30

Assessment Methodology - Lab

Mode	Attendance	CE	CA1	CA2	OEE	ESE
		Continuous evaluation	Practical test (first half of experiments)	Practical test (second half of experiments)	Open-ended experiment	Practical
Duration			3 hours	3 hours		3 hours
Exam mark		50	40	40	50	40
Converted to			15	15	10	
Marks	5	30	15		10	40
Total marks	60					40
Tentative schedule	End of semester	Every lab slot	7th week	14th week	15th week	

Scheme of Evaluation - Practical (Continuous Internal Evaluation)

Sl. No.	Criteria	Description	Marks
1	Preparation & Punctuality	Attendance, timely submission of record, pre-lab preparation, understanding of experiment objectives and theory.	10
2	Experimental Setup & Procedure	Ability to identify components/equipment, correct circuit connections/setup, systematic and safe execution of the procedure.	10
3	Observation & Data Recording	Accuracy and neatness of readings, correct use of units, tabulation, and systematic recording of results.	5
4	Analysis & Result Interpretation	Proper calculations, graphical representation, result verification, discussion, and logical conclusion.	10
5	Viva Voce / Concept Understanding	Clarity of theoretical concepts, explanation of procedure, ability to answer questions related to the experiment.	10
6	Workmanship, Discipline & Teamwork	Laboratory discipline, care of instruments, teamwork, attitude, and safety practices.	5
Total			50

Scheme of Evaluation - Practical Test & End Semester Evaluation

Category	Things to evaluate	Marks
Write-up / Procedure (before experiment)	Aim, circuit diagram/flowchart, stepwise procedure.	10
Experiment Setup & Execution	Correct circuit connections / coding / setup. Handling of instruments/software. Accuracy of execution.	10
Observation & Result / Output	Proper tabulation of readings. Calculations/graphs/program output. Correctness of result / expected outcome.	8
Viva Voce	Conceptual understanding of experiment. Related theoretical knowledge.	8
Record	Completion & neatness of practical record. Proper certification by faculty.	4
Total		40

Scheme of Evaluation - Open-ended experiment

Category	Things to evaluate	Marks
Originality and Relevance of the Idea	Assesses how creative, innovative, and relevant the chosen experiment is to the course objectives.	10
Clarity of Objectives and Experimental Plan	Evaluates how clearly the student defines the aim, scope, and systematic plan of the experiment.	10
Correctness of Execution and Data Recording	Checks the accuracy, safety, and neatness in performing the experiment and recording observations.	10
Analysis, Interpretation, and Presentation of Results	Measures the student's ability to analyze data, interpret outcomes, and present results logically.	10

Teamwork and Innovation Demonstrated	Judges the level of collaboration, initiative, and creativity shown during the experiment.	10
Total		50

SITTTR