Course Title: C - Programming Lab		Course Code: 15MC22P
Mode (L:T:P) : 0:2:4	Credits:3	Core/ Elective: Core
Type of Course Tutorials and Practical's		Total Contact Hours: 78
CIE- 25 Marks		SEE- 50 Marks

Prerequisites: Applied Science and Engineering Mathematics

Course Objectives: Understand and write C program for simple Engineering applications

Course outcome: At the end of the semester, the students must be able to

1. know the basics of programming language, algorithm , flow charts and syntax of C

   Programming

2. Write, execute, debug C program for Engineering applications

	Course Outcome	Cognitive Level	Linked with PO	Teaching Hours
CO1	know the basics of programming language, algorithm , flow charts ,and syntax of C Programming	U	1,2	18
CO2	Write, execute, debug C program for engineering applications	U/A	1,2,3,4	60
		Total sessions		**78**

Legend: R; Remember, U: Understand A: Application

Mapping of Course Outcomes with Program Outcomes

Course	Program Outcomes									
	1	2	3	4	5	6	7	8	9	10
C - Programming Lab	3	3	3	3	-	-	-	-	-	-

LEVEL 3- HIGHLY ADDRESSED, LEVEL 2-MODERATELY ADDRESSED, LEVEL 1-LOW ADDRESSED.
METHOD IS TO RELATE THE LEVEL OF PO WITH THE NUMBER OF HOURS DEVOTED TO THE COS WHICH ADDRESS THE GIVEN PO.
IF ≥40% OF CLASSROOM SESSIONS ADDRESSING A PARTICULAR PO, IT IS CONSIDERED THAT PO IS ADDRESSED AT LEVEL 3
IF 25 TO 40% OF CLASSROOM SESSIONS ADDRESSING A PARTICULAR PO, IT IS CONSIDERED THAT PO IS ADDRESSED AT LEVEL 2
IF 5 TO 25% OF CLASSROOM SESSIONS ADDRESSING A PARTICULAR PO, IT IS CONSIDERED THAT PO IS ADDRESSED AT LEVEL 1
IF < 5% OF CLASSROOM SESSIONS ADDRESSING A PARTICULAR PO, IT IS CONSIDERED THAT PO IS CONSIDERED NOT-ADDRESSED.

Contents

Unit I

Introduction to C programming, Need for a computer language, types of computer languages, algorithm, flow charts, features of C, structure of a C program, programming syntax, executing the program , Keywords, statements, standard library functions, pre-processor, main function, comments, variables, data types, operators, assignments, strings, control structures-sequential, conditional, repetitive/looping, arrays-one & two dimensions

Unit II

Programming Exercises

1. Program to calculate mechanical efficiency from given BP and IP

2. Program to calculate Area & volume of cylinder

3. Program to determine the length of the belt in case of open and cross belt drive

4. Program to determine the velocity ratio of the belt drive

5. Program to find limiting angle of friction

6. Program to calculate stress and strain using functions

7. Program to find equivalent resistance in the case of series & parallel circuits

8. Program to find equivalent capacitance in the case of series & parallel circuits

9. Program to convert mechanical power into electrical power and vice versa

10. Program to find the area and also the type of a triangle when 3 sides are given

11. Program to find the sum of odd and even number between 1 and 200

12. Program to calculate current when voltage is varied from 1 to 10 volts for given value of resistance

13. Program to add two 3X3 matrices

14. Program to accept 10 numbers, store them in an array and display the array elements.

15. Program to draw a borderline

16. Program to draw basic entities like circle, ellipse, rectangle. Arc

17. Program to draw filled areas like pie-chart

Reference

1 Programming with ANSI & Turbo C -- Ashok M Kamthane

2 Programming with C -- Byron S Gottfried

3 Programming in ANSI C -- Balaguruswamy

4 Let us C -- Yaswanth Kanetkar

5 Basics of Computer and Application -- Rajesh Hongal

e- Reference

http://gnindia.dronacharya.info/APSDept/downloads/labmanuals/COMPUTER_PROGRAMMING_APS_17012013.pdf

Contents linked with CO and PO

Sl No	Contents	CO	PO
1	Introduction to C programming, Need for a computer language, types of computer languages, algorithm, flow charts, features of C, structure of a C program, programming syntax, executing the program, Keywords, statements, standard library functions, pre-processor, main function, comments, variables, data types, operators, assignments, strings, control structures-sequential, conditional, repetitive/looping, arrays-one & two dimensions	1	1,2
2	Program to calculate mechanical efficiency from given BP and IP	2	1,2,3,4
3	Program to calculate Area & volume of cylinder	2	1,2,3,4
4	Program to determine the length of the belt in case of open and cross belt drive	2	1,2,3,4
5	Program to determine the velocity ratio of the belt drive	2	1,2,3,4
6	Program to find limiting angle of friction	2	1,2,3,4
7	Program to calculate stress and strain using functions	2	1,2,3,4
8	Program to find equivalent resistance in the case of series & parallel circuits	2	1,2,3,4
9	Program to find equivalent capacitance in the case of series & parallel circuits	2	1,2,3,4
10	Program to convert mechanical power into electrical power and vice versa	2	1,2,3,4
11	Program to find the area and also the type of a triangle when 3 sides are given	2	1,2,3,4
12	Program to find the sum of odd and even number between 1 and 200	2	1,2,3,4
13	Program to calculate current when voltage is varied from 1 to 10 volts for given value of resistance	2	1,2,3,4
14	Program to add two 3X3 matrices	2	1,2,3,4
15	Program to accept 10 numbers, store them in an array and display the array elements.	2	1,2,3,4
16	Program to draw a borderline	2	1,2,3,4
17	Program to draw basic entities like circle, ellipse, rectangle. arc	2	1,2,3,4
18	Program to draw filled areas like pie-chart	2	1,2,3,4

Student Activity

Activity No	Description of the Activity
1	Write and execute C program for a given application not mentioned in the curriculum

Note:
1. Each student should do above activity or any other similar activity related to the course COs and get it approved from concerned Teacher and HOD.
2. No student should have activity repeated or similar
3. Teacher should ensure activities by group must cover all COs
4. Teacher should asses every student by using suitable **Rubrics** approved by HOD

Rubrics

Dimension	Exemplary	Accomplished	Developing	Beginning	Roll No. of the Student				
	5/4	3	2	1	1	2	3	4	5
Organization	Information presented in logical, interesting sequence	Information in logical sequence	Difficult to follow presentation-- student jumps around	Cannot understand presentation-- no sequence of information	2				
Subject Knowledge	Demonstrates full knowledge by answering all class questions with explanations and elaborations	At ease with expected answers to questions but does not elaborate	Uncomfortable with information and is able to answer only rudimentary questions	Does not have a grasp of the information. Cannot answer questions about subject	3				
Graphics	Explain and reinforce screen text and presentation	Relate to text and presentation	Occasionally uses graphics that rarely support text and presentation	Uses superfluous graphics or no graphics	4				
Oral Presentation	Maintains eye contact and pronounces all terms	Maintains eye contact most of the time and pronounces	Occasionally uses eye contact, mostly reading	Reads with no eye contact and incorrectly	5				

precisely. All audience members can hear	most words correctly. Most audience members can hear presentation	presentation, and incorrectly pronounces terms. Audience members have difficulty hearing	pronounces terms. Speaks too quietly				
Total Score=(2+3+4+5)=14/4=3.5=4							

Course Assessment Pattern

Particulars			Max Marks	Evidence	Course outcomes
Direct Assessment	**CIE**	Two test (Average of Two tests)	10	Blue books	1 & 2
		Practical record	10	Practical record	1 & 2
		Student Activity	05	Student Activity Sheets	1 & 2
	SEE	End of the course	50	Answer scripts at BTE	1 & 2
Indirect Assessment	**Student Feedback on course**	Middle of the course		Feedback forms	1 &2
		End of the course		Feedback forms	1 & 2

*CIE – Continuous Internal Evaluation   *SEE – Semester End Examination

Note:
1. I.A. test shall be conducted as per SEE scheme of valuation. However obtained marks shall be reduced to 10 marks. Average marks of two tests shall be rounded off to the next higher digit.
2. Rubrics to be devised appropriately by the concerned faculty to assess Student activities.

Scheme of valuation for SEE

Sl. No.	Particulars	Marks
1	Write a different syntax/key words/data types/variables etc	10
2	Writing two programs	20
3	Entering of any one program	05
4	Execution of any one program	10
5	Viva Voce	05
	Total	**50**

Requirements for Basic Computer Skills Lab
(For an Intake of 60 Students [3 Batches])

Hardware requirement

Sl. No.	Equipment	Quantity
1	PC systems (latest configurations with speakers)	20
2	Laser Printers	04
3	Networking (Structured) with cat 6e / wireless 24 Port switches / Wireless Router I/O Boxes for networking (as required)	03

Software Requirement: Appropriate software.

Note: Students: Computers ratio should be strictly 1:1 for a batch of twenty Students.

1. Write a C Program to calculate mechanical efficiency from given BP and IP
2. Write a C Program to calculate Area & volume of cylinder
3. Write a C Program to determine the length of the belt in case of open and cross belt drive
4. Write a C Program to determine the velocity ratio of the belt drive
5. Write a C Program to find limiting angle of friction
6. Write a C Program to calculate stress and strain using functions
7. Write a C Program to find equivalent resistance in the case of series & parallel circuits
8. Write a C Program to find equivalent capacitance in the case of series & parallel circuits
9. Write a C Program to convert mechanical power into electrical power and vice versa
10. Write a C Program to find the area and also the type of a triangle when 3 sides are given
11. Write a C Program to find the sum of odd and even number between 1 and 100
12. Write a C Program to calculate current when voltage is varied from 1 to 10 volts for given value of resistance
13. Write a C Program to add two 3X3 matrices
14. Write a C Program to accept 10 numbers, store them in an array and display the array elements.
15. Write a C Program to draw a borderline
16. Write a C Program to draw basic entities like circle, ellipse, and rectangle. arc
17. Write a C Program to draw filled areas like pie-chart