

## I/II Semester

<b>COMPUTER PROGRAMMING LABORATORY</b>			
Course Code	<b>21CPL27/17</b>	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	0:0:2:0	SEE Marks	50
Total Hours of Pedagogy	--	Total Marks	100
Credits	01	Exam Hours	03
<b>Course Objectives:</b>			
<ol style="list-style-type: none"> <li>1. Explain problem statements and identify appropriate solutions</li> <li>2. Demonstrate the use of IDE, C Compiler, and identify and rectify the syntax and syntactic errors during programming.</li> <li>3. Development of algorithms and programs using constructs of C programming language</li> <li>4. Reporting the observations</li> </ol>			
<b>Sl. No.</b>	<b>Practise Programs</b>		
	<ul style="list-style-type: none"> <li>• Calculation of Simple Interest,</li> <li>• Check whether the given number is even or odd</li> <li>• Convert string case</li> <li>• Check for palindrome, prime number, perfect square.</li> <li>• Development of linear search algorithm Etc...</li> </ul>		
	<b><i>PART A – List of problems for which student should develop program and execute in the Laboratory</i></b>		
1	Simulation of a SimpleCalculator.		
2	Compute the roots of a quadratic equation by accepting the coefficients. Print appropriate messages.		
3	An electricity board charges the following rates for the use of electricity: for the first 200 units 80 paise per unit: for the next 100 units 90 paise per unit: beyond 300 units Rs 1 per unit. All users are charged a minimum of Rs. 100 as meter charge. If the total amount is more than Rs 400, then an additional surcharge of 15% of total amount is charged. Write a program to read the name of the user, number of units consumed and print out the charges.		
4	Implement Binary Search on Integers / Names.		
5	Implement Matrix multiplication and validate the rules of multiplication.		
6	Compute sin(x)/cos(x) using Taylor series approximation. Compare your result with the built-in library function. Print both the results with appropriate inferences.		
7	Sort the given set of N numbers using Bubble sort.		
8	Write functions to implement string operations such as compare, concatenate, string length. Convince the parameter passing techniques.		
9	Implement structures to read, write and compute average- marks and the students scoring above and below the average marks for a class of N students.		
10	Develop a program using pointers to compute the sum, mean and standard deviation of all elements stored in an array of N real numbers.		
11	Implement Recursive functions for Binary to Decimal Conversion.		
	<b>PART B – Practical Based Learning</b>		
1	A problem statement for each batch is to be generated in consultation with the co-examiner and student should develop an algorithm, program and execute the program for the given problem with appropriate outputs.		
<b>Course Outcome (Course Skill Set)</b>			
At the end of the course the student will be able to:			
<ol style="list-style-type: none"> <li>1. Define the problem statement and identify the need for computer programming</li> <li>2. Make use of C compiler, IDE for programming, identify and correct the syntax and syntactic errors in programming</li> <li>3. Develop algorithm, flowchart and write programs to solve the given problem</li> <li>4. Demonstrate use of functions, recursive functions, arrays, strings, structures and pointers in problem solving.</li> </ol>			

5. Document the inference and observations made from the implementation.

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each course. The student has to secure not less than 35% (18 Marks out of 50) in the semester-end examination (SEE).

**Continuous Internal Evaluation (CIE):**

CIE marks for the practical course is **50 Marks**.

The split-up of CIE marks for record/ journal and test are in the ratio **60:40**.

- Each experiment to be evaluated for conduction with observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments designed by the faculty who is handling the laboratory session and is made known to students at the beginning of the practical session.
- Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks.
- Total marks scored by the students are scaled down to 30 marks (60% of maximum marks).
- Weightage to be given for neatness and submission of record/write-up on time.
- Department shall conduct 02 tests for 100 marks, the first test shall be conducted after the 8<sup>th</sup> week of the semester and the second test shall be conducted after the 14<sup>th</sup> week of the semester.
- In each test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce.
- The suitable rubrics can be designed to evaluate each student's performance and learning ability. Rubrics suggested in Annexure-II of Regulation book
- The average of 02 tests is scaled down to **20 marks** (40% of the maximum marks).

The Sum of scaled-down marks scored in the report write-up/journal and average marks of two tests is the total CIE marks scored by the student.

**Semester End Evaluation (SEE):**

- SEE marks for the practical course is 50 Marks.
- SEE shall be conducted jointly by the two examiners of the same institute, examiners are appointed by the University
- All laboratory experiments are to be included for practical examination.
- (Rubrics) Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners. **OR** based on the course requirement evaluation rubrics shall be decided jointly by examiners.
- Students can pick one question (experiment) from the questions lot prepared by the internal /external examiners jointly.
- Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners.
- General rubrics suggested for SEE are mentioned here, writeup-20%, Conduction procedure and result in -60%, Viva-voce 20% of maximum marks. SEE for practical shall be evaluated for 100 marks and scored marks shall be scaled down to 50 marks (however, based on course type, rubrics shall be decided by the examiners)
- *Students can pick one experiment from the questions lot of PART A with equal choice to all the students in a batch. For PART B examiners should frame a question for each batch, student should develop an algorithm, program, execute and demonstrate the results with appropriate output for the given problem.*

- *Weightage of marks for PART A is 80% and for PART B is 20%.General rubrics suggested to be followed for part A and part B.*
- Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero (Not allowed for Part B).
- The duration of SEE is 03 hours

Rubrics suggested in Annexure-II of Regulation book

**Suggested Learning Resources:**

1. YashavanthKanetkar, Let us C, Authentic Guide to C Programming Language, bpb publisher, 17<sup>th</sup> Edition, 2020.
2. Herbert Schildt, C: The complete reference, Mc Graw Hill, 4<sup>th</sup> Edition, 2017
3. Programming in C , Reema Theraja

**Web links and Video Lectures (e-Resources):**

1. <http://elearning.vtu.ac.in/econtent/courses/video/BS/14CPL16.html>
2. <https://nptel.ac.in/courses/106/105/106105171/>