Sangameshwar College, Solapur
Department of Mathematics
Course Proposal

Course Name :- Certificate Course in "Programming in C for B.Sc. Students"

Course Duration :- Six months

No. of Lectures Required :-

        01) Theory   **:** 71 hrs.

        02) Practical   **:** Weekly 3 hrs.

Examination :- Theory   70 marks

                  Practical   30 marks

Course Fee :-   2000 Rs.

Theory

C-Question Paper Format

Time:2.30 hours   **Total Marks:70**

Que. 01 : Choose & write a correct answer from given Four Alternatives. (14 Questions)
14

Que. 02 : Attempt any seven out of nine questions

14

Que. 03 : A) Attempt any two out of three questions

10

B) Short note compulsory

04

Que. 04 : Attempt any two out of three questions

14

Que. 05 : Attempt any two out of three questions

14

Practical Examination

Time: 2.30 hours   **Total Marks:30**

Qus. 01 : Write and run three C-Programs out of four.
30

C Programming Features

1. **C is the most commonly used programming language in industry.**

   Academic institutions have a mission to teach technologies that are widely used in the real world so that students have the skills and knowledge that employers need. More than 90 percent of the programs running on our desktops, from operating systems and e-mail clients to Web browsers and word processors, are written in C or its relative, C++ which has extensions to C. Most games and underlying robot control software are written in C or C++. With the knowledge of C, students will not only be able to play games and robots, but also understand their underlying working principles and potentially develop their own games and robots.

   C is the language of choice for programming embedded and mechatronic systems with hardware interfaces.

2. **C is one of the most commonly used programming languages in colleges and universities.**

   Computer programming is an essential skill for advanced studies in Science, Technology, Engineering, and Mathematics (STEM) fields. Like in industry, C is also one of the most commonly used programming languages in colleges and universities for teaching and research.

3. **C is the base for almost all popular programming languages.**

   C is the language of choice for system programming. Because of the performance and portability of C, almost all popular cross-platform programming languages and scripting languages, such as C++, Java, Python, Objective-C, Perl, Ruby, PHP and Bash, are implemented in C and borrowed syntaxes and functions heavily from C. They share the similar operators, expressions, repetition statements, control structures, arrays, input and output, and functions.

4. **C excels as a model of programming languages.**

   C does an excellent job of illustrating the underlying working principles of computers, scientific computing, and disciplined software development. Students gain valuable knowledge of such fundamental programming concepts as data types, internal data representations, operators, expressions, loops for repetitions, control structures, arrays, input and output, functions, debugging, etc. Studying C provides a solid foundation for students who want to learn advanced programming skills such as object-oriented programming, event-driven programming, multi-thread programming, real-time programming, embedded programming, network programming, parallel programming, other programming languages, and new and emerging computing paradigms such as grid-computing and cloud computing.

5. **Once students have learned C, they can pick up any other languages by themselves.**

   Certain languages and tools are typically used to solve domain specific problems. Therefore, the ability to understand and learn new languages is important. All other modern languages borrowed heavily from C. Once

students learned C, it is easy for them to learn by themselves any other computer languages without much difficulty. On the other hand, even if students have learned other programming languages or visual programming, it is generally still quite difficult for them to learn C by themselves, especially for difficult topics such as pointers and linked lists. Computer programming in C needs a disciplined approach. Many people believe that if students start with computer programming using a typeless scripting language first, then they would have even harder time to learn and master C afterwards.

6. **C is a standardized programming language with international standards.**

   A standardized programming language is stable and its evolution is overseen by a technical standard committee made up of business, academic, and organizational representatives with a stake in the language.

7. **Computer programming is becoming a necessary skill for many professions.**

   Writing computer programs is essential to solving complex science and engineering problems. Many principles and concepts in STEM disciplines can be illustrated and reinforced through writing programs. C and C++ are more widely used in STEM fields than any other programming languages such as Java, Fortran, or Matlab.

8. **Computer programming can develop student's critical thinking capabilities.**

   Developing a program to solve a practical problem involves many creative works, including design, logic reasoning, math, etc. It can help students find practical applications of many math concepts such as variables in Algebra I and trigonometry. Debugging a program can also help student improve their reasoning and logical thinking capabilities. The computer-aided problem solving capabilities can be trained using c

9. **C is the mother of all languages and few reasons to consider learning C is that it makes your fundamentals very strong.**

10. Every year **Infosys/Wipro** like software companies advertise in TMI for the requirement of **B.Sc. (First Class)** with knowledge of 'C Language' students for their placement.

11. This course will help you for better package & placement in reputed software industries.

Session ID	Session Name	Days
1	Algorithms	2
2	Introduction To Flowcharts	2
3	Introduction To C Language	3
	Types of Languages, Programming Approaches	
	History of C Programming Language	
	Structure of C Language	
	Keywords, Indentifiers	
	Data Types, Variables, Constants, #define Statement	
4	Input/Output Functions	3
5	Operator In C	5
	Assignment Operators	
	Arithmetic Operators	
	Arithmeic Unary Operators	
	Relational Operators	
	Logical Operators	
	Conditional/Ternary Operators	
6	Decision Control Structures	4
	Simple if Statement	
	Nested if	
	The if_else Statement	
	Nested if_else Statement	
	The if_else Ladder	
7	Loop Control Structures	9
	Loops	
	while Loop	
	do_while Loop	
	for Loop	
	Nesting of Loops	
	break, continue Statement	
8	Case Control Structure	2
	switch Statement	
	switch vs if_else	
	goto Keyword	
9	Arrays	5
	What are arrays	
	Types of Arrays	
10	String	5
	What are strings	
	String Manipulations	
	String Handling Functions	
	Two Diamensional Array of Characters	
11	Pointers	5
	Introduction To Pointers	
	Pointer To Variable	
	Pointer To 1D Array	
	Pointer To 2D Array	
	Pointer To String	
	Pointer To Pointer	
12	Memory Allocation	3
	Memory Allocation Schemes	
	sizeof(), malloc(), calloc(), free(), realloc()	

13	Functions	8
	What is function, Why use functions	
	Types of Functions	
	Nesting of Functions	
	Parameter Passing Mechanism	
	Recursion	
14	Storage Classes	3
	Automatic Storage Class	
	External Storage Class	
	Static Storage Class	
	Register Storage Class	
15	Type Casting	1
	Conversion By Using Assignment Operator	
	Conversion By Using Caste Operator	
16	Structures & Union	4
	Why use structures	
	Declaring Structure	
	Accessing Structure Elements	
	Nesting of Structure	
	Array of Structure	
	Pointer To Structure	
	Structure & Functions	
	typedef Keyword	
	Unions	
	Enum Data Types	
17	File Handling	4
	File Operations (Opening, Reading, Closing File)	
	File Modes	
	Unformatted File I/O Functions	
	Formatted Disk I/O Functions	
	Binary File Handling	
	Random File Access	
18	Introduction to Graphics	3
	Total	71