

COMPUTER PROGRAMMING

II Semester: AE / CE / ME																				
Course Code	Category	Hours / Week			Credits	Maximum Marks														
ACS001	Foundation	L	T	P	C	CIA	SEE	Total												
		3	-	-	3	30	70	100												
Contact Classes: 45		Tutorial Classes: Nil		Practical Classes: Nil			Total Classes: 45													
<p>I. COURSE OVERVIEW: The course emphasis on the problem-solving aspects in using C programming. It is the fundamental course and is interdisciplinary in nature for all engineering applications. The students will understand programming language, programming, concepts of loops, reading a set of data, step wise refinements, functions, control structures, arrays, dynamic memory allocations, enumerated data types, structures, unions, and file handling. This course provides adequate knowledge to solve problems in their respective domains.</p> <p>II. OBJECTIVES: The course should enable the students to: I. Learn adequate knowledge by problem solving techniques. II. Understand programming skills using the fundamentals and basics of C Language. III. Improve problem solving skills using arrays, strings, and functions. IV. Understand the dynamics of memory by pointers. V. Study files creation process with access permissions.</p> <p>III. COURSE OUTCOMES: After successful completion of the course, students should be able to: CO 1 Illustrate problem solving steps in terms of algorithms, pseudo code, flowcharts and programs with basic data types and operations for Mathematical and Engineering problems. Understand CO 2 Implement derived data types, operators in C program statements. Apply CO 3 Construct programs involving decision structures, loops, arrays and strings. Apply CO 4 Make use of various types of functions, parameters, return values and structures for complex problem solving. Apply CO 5 Illustrate the static and dynamic memory management with the help of structures, unions and pointers. Understand CO 6 Extend file input and output operations in implementation of realtime applications. Understand</p> <p>IV. SYLLABUS:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%; text-align: center;">UNIT-I</td> <td style="width: 70%; text-align: center;">INTRODUCTION</td> <td style="width: 20%; text-align: center;">Classes: 10</td> </tr> <tr> <td colspan="3"> Introduction to computers: Computer systems, computing environments, computer languages, creating and running programs, algorithms, flowcharts; Introduction to C language: History of C, basic structure of C programs, process of compiling and running a C program, C tokens, keywords, identifiers, constants, strings, special symbols, variables, data types; Operators and expressions: Operators, arithmetic, relational and logical, assignment operators, increment and decrement operators, bitwise and conditional operators, special operators, operator precedence and associativity, evaluation of expressions, type conversions in expressions, formatted input and output. </td> </tr> <tr> <td style="text-align: center;">UNIT-II</td> <td style="text-align: center;">CONTROL STRUCTURES, ARRAYS AND STRINGS</td> <td style="text-align: center;">Classes: 10</td> </tr> <tr> <td colspan="3"> Control structures: Decision statements; if and switch statement; Loop control statements: while, for and do while loops, jump statements, break, continue, goto statements; Arrays: Concepts, one dimensional </td> </tr> </table>									UNIT-I	INTRODUCTION	Classes: 10	Introduction to computers: Computer systems, computing environments, computer languages, creating and running programs, algorithms, flowcharts; Introduction to C language: History of C, basic structure of C programs, process of compiling and running a C program, C tokens, keywords, identifiers, constants, strings, special symbols, variables, data types; Operators and expressions: Operators, arithmetic, relational and logical, assignment operators, increment and decrement operators, bitwise and conditional operators, special operators, operator precedence and associativity, evaluation of expressions, type conversions in expressions, formatted input and output.			UNIT-II	CONTROL STRUCTURES, ARRAYS AND STRINGS	Classes: 10	Control structures: Decision statements; if and switch statement; Loop control statements: while, for and do while loops, jump statements, break, continue, goto statements; Arrays: Concepts, one dimensional		
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arrays, declaration and initialization of one dimensional arrays, two dimensional arrays, initialization and accessing, multi dimensional arrays; Strings concepts: String handling functions, array of strings.		
UNIT-III	FUNCTIONS AND POINTERS	Classes: 09
<p>Functions: Need for user defined functions, function declaration, function prototype, category of functions, inter function communication, function calls, parameter passing mechanisms, recursion, passing arrays to functions, passing strings to functions, storage classes, preprocessor directives.</p> <p>Pointers: Pointer basics, pointer arithmetic, pointers to pointers, generic pointers, array of pointers, pointers and arrays, pointers as functions arguments, functions returning pointers.</p>		
UNIT-IV	STRUCTURES AND UNIONS	Classes: 08
Structures and unions: Structure definition, initialization, accessing structures, nested structures, arrays of structures, structures and functions, passing structures through pointers, self referential structures, unions, bit fields, typedef, enumerations; Dynamic memory allocation: Basic concepts, library functions.		
UNIT-V	FILES	Classes: 08
Files: Streams, basic file operations, file types, file opening modes, file input and output functions, file status functions, file positioning functions, command line arguments.		
Text Books:		
<ol style="list-style-type: none"> 1. Stephen G. Kochan, "Programming in C", Addison-Wesley Professional, 4th Edition, 2014. 2. B. A. Forouzan, R. F. Gillberg, "C Programming and Data Structures", Cengage Learning, India, 3rd Edition, 2014. 		
Reference Books:		
<ol style="list-style-type: none"> 1. W. Kernighan Brian, Dennis M. Ritchie, "The C Programming Language", PHI Learning, 2nd Edition, 1988. 2. Yashavant Kanetkar, "Exploring C", BPB Publishers, 2nd Edition, 2003. 3. E. Balagurusamy, "Programming in ANSI C", Mc Graw Hill Education, 6th Edition, 2012. 4. Schildt Herbert, "C: The Complete Reference", Tata Mc Graw Hill Education, 4th Edition, 2014. 5. R. S. Bichkar, "Programming with C", Universities Press, 2nd Edition, 2012. 6. Dey Pradeep, Manas Ghosh, "Computer Fundamentals and Programming in C", Oxford University Press, 2nd Edition, 2006. 		
Web References:		
<ol style="list-style-type: none"> 1. https://www.bfoit.org/itp/Programming.html 2. https://www.khanacademy.org/computing/computer-programming 3. https://www.edx.org/course/programming-basics-iitbombayx-cs101-1x-0 4. https://www.edx.org/course/introduction-computer-science-harvardx-cs50x 		
E-Text Books:		
<ol style="list-style-type: none"> 1. http://www.freebookcentre.net/Language/Free-C-Programming-Books-Download.htm 2. http://www.imada.sdu.dk/~svalle/courses/dm14-2005/mirror/c/ 3. http://www.enggnotebook.weebly.com/uploads/2/2/7/1/22718186/ge6151-notes.pdf 		

MOOC Course

1. <https://www.alison.com/courses/Introduction-to-Programming-in-c>
2. <http://www.ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-s096-effective-programming-in-c-and-c-january-iap-2014/index.htm>

Course Home Page: