Course code	Course Name	L-T-P-Credits	Year of Introduction
BM206	FUNDAMENTALS OF COMPUTER PROGRAMMING	3-0-0-3	2016

Course Objectives

1. To impart basics of digital computers
2. To think logically and write pseudo code or draw flow charts for problems.
3. To learn use of arrays, strings, functions, pointers, structures and unions in C++.
4. Classes and files in C++

Syllabus

Introduction to digital computers and programming languages, Problem-Solving strategies – Algorithms, Flowcharts, Introduction to C++, characteristics of OOP, arrays, strings. Functions and storage classes, Structures and Classes – Data hiding, Polymorphism, Overloading. Memory Allocation functions.

Expected Outcome

- Design C++ Programs for problems.
- Ability to design modular programs using functions
- Ability to design interactive programs using various control structures
- Design file handling programs

Text Books:

1. Introduction to Computer Science, ITL Education Solutions Limited, Pearson Education
2. Computer Basics and C Programming, V Rajaraman, Prentice Hall India
3. Programming with C++ - Schaum's outlines, John R Hubbard, McGraw-Hill.

Reference Books:

1. A.R.Venugopal, Rajkumar, T. Ravishanker "Mastering C++", TMH, 1997.
2. R. Lafore, "Object Oriented Programming using C++", BPB Publications, 2004.
3. Schildt Herbert, "C++ Programming", 2nd Edition, Wiley Dream Tech.
4. D .Parasons, "Object Oriented Programming with C++", BPB Publication, 1999.
5. Steven C. Lawlor, "The Art of Programming Computer Science with C++", Vikas Publication, 2002
6. Yashwant Kanethkar, "Object Oriented Programming using C++", BPB, 2004.
7. Programming with C++ , P. Radha Ganesan, Scitech Publications

Course Plan

Module	Contents	Hours	Sem. Exam Marks
I	Introduction to digital computer – Von Neumann concept – A simple model of a computer. Details of the functional units of a computer. Secondary storage devices. (Discuss on the functionalities and interaction of different units. Concepts like memory addressing, registers, buses are to be introduced, Various categories of input output devices have to be discussed (Only the working principle). Different types of storage devices are to be introduced (Refer Chapters 3 – 7 of	5	15%

	first text book) Computer software – Software classifications, Operating systems- Specify the functions of OS and different types of OS. Introduction to programming languages: types of programming languages – high level, assembly level and machine level language. Briefly discuss the classifications of high level languages, compiler, interpreter and assembly language (Chapter 2 of the second text book can be used as reference).		
II	Problem-Solving strategies – formal definition – solution - top down design, algorithms, flowcharts, modular programming (Examples for algorithms, flowcharts are to be discussed. Class assignments/tutorials as much as possible is to be given to improve understanding on problem-solving. Chapter 8 of first text book and Chapters 4 and 5 of the second text may be used as reference.)	**5**	**15%**
FIRST INTERNAL EXAM			
III	Introduction to C++, features, Character set, identifiers, Keywords, Data types, expressions, Operators - arithmetic, relational and logical operators. Bitwise, Shift and assignment operators – Operator precedence and associativity, casting and coercion. Explain each with examples. Structure of C++ program. Standard input -output functions Control Statements- Selection statements - if, if else, if else if ladder, nested if, switch statement. Loops – while, do while, for. Continue, break and return – Syntax with explanation and examples. Simple programs using each construct (Chapters 1 to 3 of Third text book)	**8**	**15%**
IV	Arrays-Single and multidimensional arrays. Declaration and initialization, simple programs Functions – Library and user defined functions, parameter passing mechanisms, inline functions, Strings and important string handling functions Introduction to pointers – Dynamic memory allocation (Chapters 4 to 7 of third text book)	**8**	**15%**
SECOND INTERNAL EXAM			
V	Classes, objects, instances. Access specifiers – private, protected and public. Constructors and destructors. Friend function and friend class. New and delete operators. Copy constructor. this pointer. Static data member and static member functions. (Explain each with example) (Chapters 8 of Third text)	**8**	**20%**
VI	Inheritence – single, multiple and multilevel inheritance – access in inheritance. Overloading – function and operator overloading. Polymorphism – virtual functions, pure virtual functions, abstract functions (Explain with examples) (Chapters 9 and 11 of Third text) Files – Reading and Writing in Files, File Updation – Random and Sequential Access (Explain with example)	**8**	**20%**

QUESTION PAPER PATTERN:

Maximum Marks: 100 Exam Duration: 3 Hours

There shall be three parts for the question paper.

Part A includes Modules 1 & 2 and shall have three questions of fifteen marks out of which two are to be answered. There canl be subdivisions, limited to a maximum of 4, in each question.

Part B includes Modules 3 & 4 and shall have three questions of fifteen marks out of which two are to be answered. There canl be subdivisions, limited to a maximum of 4, in each question.

Part C includes Modules 5 & 6 and shall have three questions of twenty marks out of which two are to be answered. There canl be subdivisions, limited to a maximum of 4, in each question.

Note: Each part shall have questions uniformly covering both the modules in it.