KOLHAN UNIVERSITY, CHAIBASA
JHARKHAND, INDIA

Syllabus of

Bachelor of Information Technology

B.Sc (IT)

Under Four Year Under Graduate Programme (FYUGP)

B.Sc.I.T. Course Structure F.Y.U.G.P.

Semester	Code	Paper	L	T	P	Credit
I	CC-1					
	CC-2					
	CC-3					
	IRC-1	Logical Organisation of Computers	2	1	0	3
	IVS-1A					
	MJ-1	Programming with C	3	1	0	4
		Lab on C programming	0	0	2	2
II	CC-4					
	CC-5					
	CC-6					
	IRC-2					
	IVS-1B					
	MJ-2	Data structure using C	3	1	0	4
		Lab on data structure	0	0	2	2
III	CC-7					
	CC-8					
	CC-9					
	IRC-3					
	IAP	Internship/Project				
	MJ-3	Database Management System	3	1	0	4
		Lab on SQL	0	0	2	2
IV	MJ-4	Python Programming	3	1	0	4
		Lab on Python Programming	0	0	2	2
	MJ-5	Operating System	3	1	0	4
		Lab on LINUX Shell programming	0	0	2	2
	MN-1	Software Engineering	4	2	0	6
	VS-1	E-commerce technology	3	1	0	4
V	MJ-6	Data Communications and Networking	3	1	0	4

		Socket Programming	0	0	2	2
	MJ-7	Object oriented Programming Using Java	3	1	0	4
		Lab on Java Programming	0	0	2	2
	MN-2	Numerical techniques	3	1	0	4
		Lab on Numerical methods	0	0	2	2
	VS-2	Computer Graphics and Multimedia	2	0	0	2
		Lab on Graphics	0	0	2	2
VI	MJ-8	Machine Learning	3	1	0	4
		Lab on Machine Learning	0	0	2	2
	MJ-9	Information Security	3	1	0	4
		Lab on Cryptography	0	0	2	2
	MN-3	Data Mining	3	1	0	4
		Lab on data mining	0	0	2	2
	VS-3	Web Technology	2	0	0	2
		Lab on HTML, CSS, XML	0	0	2	2
VII	AMJ-1	Artificial Intelligence	3	1	0	4
		Lab on artificial intelligence	0	0	2	2
	AMJ-2	Internet of Things(IOT)	3	1	0	4
		Lab on IoT	0	0	2	2
	RC-1	Research Methodology				6
	RC-2	Research Proposal				4
VIII	AMJ-3	Cloud Computing	3	1	0	4
		Lab On Cloud Computing	0	0	2	2
	AMJ-4	Soft Computing	3	1	0	4
		Lab on Soft Computing	0	0	2	2
	RC-3	Research Internship				4
	RC-4	Research Work				4
	VSR	Software ProjectManagement	0	0	2	2

MJ–1 (Th): Problem Solving And Programming In C

4 Credits | 60 Minimum Class Hours | Semester I

Objectives

- To understand about the programming language
- To develop C Programs using basic Programming Constructs, Loops Arrays and Strings
- To develop applications in C using Functions , Pointers and Structures
- To perform I/O operations and File Handling in C

Module-I: C language fundamentals:

Introduction to C, Character Set, Keywords, Identifiers, Constants, Variables, Storage class, Data types, Operators & Expressions, Header files, Library files, Pre-processor directives, # include and #define.

Module-II:Decision making and Branching:

Decision making with if statement– Simple if statement, The if …. Else statement, Nesting of if …. Elsestatement, The else if ladder, The switch-casestatement, The ? : Operator.

Decision making and Looping:
The while statement, The do statement, The for statement, Jumps in loops. break , continue, goto statement

Module-III: Arrays:

One - dimensional arrays, Declaration of one – dimensional arrays, Two – dimensional arrays, Declaration of two – dimensional arrays, Multi – dimensional arrays.

Character Arrays and String:
Declaring and initializing string variables, Reading string from terminal, writing string to screen, Putting string together, Comparison of two strings, String handling functions, Other features of strings

.**Module-IV:User defined functions:**

A multi – function program, Definition of function, Function calls, Function declaration, Category of functions,Nesting of functions, Recursion, Passing arrays to functions, Passingstrings to functions

Module – V: Structures , Unions and File Handling:

Defining a structure, Declaring structurevariables, Accessing structure members, Arrays of structures, Arrayswithin structures, Structures within structures, Structures andfunctions, Union.

Pointers: Understanding pointers, Accessing the address of avariable, declaring pointer variables, Pointer expressions, Array ofpointers, Pointers to function, Pointers and structures.

File Management: Defining and opening a file, Closing a file,Input/Output operations on files, Error handling during I/O operations

Books:

1)Y. Kanetkar, "Let Us C", BPB Publication, 13th Edition.

2)E.Balagurusamy," Programming in ANSI C", TMH, Sixth Edition.

MJ–1 (Pr): Programming using C Lab

2 Credits | 60 Minimum Class Hours | Semester I

OBJECTIVES:

- To develop programs in C using basic Programming Constructs
- To develop applications in C using Arrays and Strings
- To design and implement applications in C using Functions, Structures
- To develop applications in C using Files

List of Programs as Assignments:

- Write a program using I/O statements and expressions.
- Write programs using decision-making constructs.
- Write a program to find whether the given year is leap year or not? (Hint: not every centurion year is a leap. For example, 1700, 1800 and 1900 is not a leap year)

- Write a program to perform the Calculator operations, namely, addition, subtraction, multiplication, division and square of a number.
- Write a program to check whether a given number is Armstrong number or not?
- Write a program tocheck whether a given number is odd or even?
- Write a program to find the factorial of a given number.
- Write a program to find out the average of 4 integers.
- Write a program to display array elements using two dimensional arrays.
- Write a program to perform swapping using function.
- Write a program to display all prime numbers between two intervals using functions.
- Write a program to reverse a sentence using recursion.
- Write a program to get the largest element of an array using the function.
- Write a program to concatenate two strings.
- Write a program to find the length of String.
- Write a program to find the frequency of a character in a string.
- Write a program to store Student Information in Structure and Display it.
- The annual examination is conducted for 10 students for five subjects.
- Write a program to read the data and determine the following:
  (a) Total marks obtained by each student.
  (b) The highest marks in each subject and the marks of the student whosecured it.
  (c) The student who obtained the highest total marks.
- Insert, update, delete and append telephone details of an individual or a company into a telephone directory using random access file.
- Count the number of account holders whose balance is less than the minimum balance using sequential access file.

MJ–2 (Th): Data Structure using C

4 Credits | 60 Minimum Class Hours | Semester I

Objectives

- To know details about the Data Structure
- Applications, advantages and limitations of various data structures.
- To know real life use of data structures.
- Implementations of variousdata structures.
- Analyse and compare the different algorithms.

Module – I Algorithms and Analysis of Algorithms:

Definition, Structure and Properties of Algorithms, Development of an Algorithm, Data Structures and Algorithms,

Data Structure – Definition and Classification, Efficiency of Algorithms, Asymptotic Notations, Polynomial Vs Exponential Algorithms, Average, Best and Worst case Complexities.

Module – II Arrays, Stacks and Queues:

Array Operations, Number of Elements in an Array, Representation of Arrays in Memory, Applications of Array, Stack- Introduction, Stack Operations, Applications of Stack, Queues-Introduction, Operations on Queues, Circular Queues, Other Types of Queues, and Applications of Queues.

Module – III Linked List, Linked Stacks and Linked Queues:

Singly Linked Lists, Circularly Linked Lists, Doubly Linked Lists, Applications of Linked Lists, Introduction to Linked Stack and Linked Queues, Operations on Linked Stacks and Linked Queues, Implementations of Linked Representations, Applications of Linked Stacks and Linked Queues.

Module – IVTrees, Binary Trees, BST, Graphs:

Trees: Definition andBasic Terminologies, Representation of Trees, Binarytrees: BasicTerminologies and Types, Representation of Binary Trees, Binary TreeTraversals, Threaded Binary Trees, Applications. Introduction, BST: Definitionand Operations,
Graphs - Representation of graphs - BFS - DFS - Topological sort - String representation and manipulations - Pattern matching.

Module – V Sorting and searching:

Sorting Techniques - Selection - Bubble - Insertion - Merge - Heap - Quick - Radix sort - Address calculation - Linear search - Binary search - Hash table methods.

TEXT BOOKS:

1. E. Horowitz, S. Sahni,S. A-Freed, "Fundamentals of Data Structures",Universities Press, Second Edition, 2008.
2. A.V.Aho, J. E.Hopperoft, J. D.Ullman, "Data Structures and Algorithms",Pearson Education, 1983.

MJ–2 (Pr): Data Structure Lab using C

2 Credits | 60 Minimum Class Hours | Semester II

OBJECTIVES:

- To assess how the choice of data structures and algorithm design methods impact the performance of programs.
- To choose the appropriate data structure and algorithm design method for a specified application.
- To solve problems using data structures such as linear lists, stacks, queues, hash tables, binary trees, heaps, binary search trees, and graphs and writing programs for these solutions.
- Analyse and compare the different algorithms

List of Programs as Assignments:

- Program to Find the Number of Elements in an Array

- Programs for Stack, Queues and Circular Queues using Arrays
- Program to convert an Infix Expression into Postfix and Postfix Evaluation
- Program to implement stack using arrays
- Program to implement stack using linked list
- Program to convert infix notation to postfix notation using stacks
- Program to implement queue using arrays
- Program to reverse elements in a queue
- Program to implement circular queue using arrays
- Program to create add remove & display element from single linked list
- Program to create add remove & display element from double linked list
- Program to count number of nodes in linear linked list
- Program to create add remove & display element from circular linked list
- Programs to implement stack & queues using linked representation
- Program to concatenate two linear linked lists
- Program to accept a singly linked list of integers & sort the list in ascending order.
- Program to reverse linked list
- Program to represent polynomial using linked list
- Program for the creation of binary tree, provide insertion & deletion in c
- Program for pre-order, post-order & in-order traversals of a binary tree using non recursive.
- Program to count no, of leaves of binary tree
- Program to implement bubble sort program using arrays
- Program to implement merge sort using arrays
- Program to implement selection sort program using arrays
- Program to implement insertion sort program using arrays
- Program to implement linear search using arrays
- Program to implement binary search using arrays
- Program to implement of BFS, DFS