Curriculum Design Committee, Uttarakhand

S. No.	Name & Designation	
1.	Prof. N.K. Joshi Vice-Chancellor, Sridev Suman Uttarakhand University, New Tehri	Chairman
2.	Vice-Chancellor, Kumaun University, Nainital	Member
3.	Prof. Jagat Singh Bisht Vice-Chancellor, Soban Singh Jeena University Almora	Member
4.	Prof. Surekha Dangwal Vice-Chancellor, Doon University, Dehradun	Member
5.	Prof. O. P. S. Negi Vice-Chancellor, Uttarakhand Open University, Haldwani	Member
6.	Prof. M.S.M. Rawat Advisor, Rashtriya Uchchatar Shiksha Abhiyan, Uttarakhand	Member
7.	Prof. K. D. Purohit Advisor, Rashtriya Uchchatar Shiksha Abhiyan, Uttarakhand	Member

DEPARTMENT OF INFORMATION TECHNOLOGY

Kumaun University Nainital

Common Minimum Syllabus

Bachelor's in Information Technology

(As per National Education Policy-2020)

For the first three years of Higher Education (UG Professional Course)

Faculty of Science

(2023)

Curriculum Design / Syllabus Framing Committee

S. No	Name	Designation
1	Ms. Umang Asstt. Professor Dept of Computer Application DSB Campus Nainital	Presenter
2	Ms. Astha Asstt Professor Dept of Information Technology Surajmal University, Kichaa	Rapportieur
3.	Dr. Subhash Chandra Asstt Prof & incharge Dept of Information Technology SSJ University, Almora	Expert
3	Dr. BP Pandey Asstt. Professor SSJ university, LSM Campus, Pithoragrah	Expert
4.	Dr. Kamika Chaudhary Asstt. Professor MB.PG College Haldwani	Expert
5.	Dr. Ashutosh Bhatt Associate Professor School of computer Science UOU, Haldwani	Expert
6.	Sh Vikram Bedi Asstt. Professor Dept of Information Technology DSB Campus KU Nainital	Expert
7	Sh Vikram Bedi Asstt. Professor Dept of Information Technology DSB Campus KU Nainital	Expert

THREE YEAR COURSE STRUCTURE (BACHELOR IN INFORMATION TECHNOLOGY)								
CERTIFICATE IN INFORMATION TECHNOLOGY								
Year	**Sem**		**Subject**	**Course Code**	**Paper Title**	**Theory/Practical**	**Marks**	**Credit**
First Year	**I**	**Major**	**I**	BIT-101	Information Technology Fundamentals	Theory	100 (25+75)	4
			II	BIT-102	Problem solving Techniques with programming	Theory	100 (25+75)	4
			III	BIT-103	Digital Electronics	Theory	100 (25+75)	4
			IV	BIT-104	Mathematical Foundation of Computer Science	Theory	100 (25+75)	4
			V	BIT-105	Problem solving Techniques with programming	Practical	100 (25+75)	4
		Minor/Elective	**VI**	BIT-106	Office Automation Using PC Packages	Practical	100 (25+75)	4**
		Co-Curricular	**Co-C-1**		Communication Skills		100 (25+75)	Qlfy.
	II	**Major**	**I**	BIT-201	Data Structure Using C	Theory	100 (25+75)	4
			II	BIT-202	Internet Technologies	Theory	100 (25+75)	4
			III	BIT-203	Discrete Mathematics	Theory	100 (25+75)	4
			IV	BIT-204	Multimedia Technology	Theory	100 (25+75)	4
			V	BT-205	Data Structure Using C	Practical	100 (25+75)	4
		Minor/Elective	**VI**	BIT-206	Organization Behaviour	Theory	100 (25+75)	4**
		Co-Curricular	**Co-C-2**				100 (25+75)	Qlfy.
							TOTAL	48

COURSE STRUCTURE								
DIPLOMA IN INFORMATION TECHNOLOGY								
Year	**Sem**		**Subject**	**Course Code**	**Paper Title**	**Theory/Practical**	**Marks**	**Credit**
Second Year	**III**	**Major**	**I**	BIT-301	PHP & MySQL	Theory	100 (25+75)	4
			II	BIT-302	Database Management System	Theory	100 (25+75)	4
			III	BIT-303	Optimization Technique	Theory	100 (25+75)	4
			IV	BIT-304	Computer Communication & Networks	Theory	100 (25+75)	4
			v	BIT-305	PHP & MySQL hands on trainingl	Practical	100 (25+75)	4
		Minor/Elective	**VI**	BIT-306	Cyber Security and Cyber Law	Theory	100 (25+75)	4**
		Co-Curricular	**Co-C-3**				100 (25+75)	Qlfy.
	IV	**Major**	**I**	BIT-401	JAVA Programming	Theory	100 (25+75)	4
			II	BIT-402	Software Engineering	Theory	100 (25+75)	4
			III	BIT-403	Operating System	Theory	100 (25+75)	4
			IV	BIT-404	E-commerce	Theory	100 (25+75)	4
			v	BIT-405	JAVA Programming practical	Practical	100 (25+75)	4
		Minor/Elective	**VI**	BIT-406	Cloud Computing Tools And Techniques	Theory	100 (25+75)	4**
		Co-Curricular	**Co-C-4**				100 (25+75)	Qlfy.
							TOTAL	48

COURSE STRUCTURE								
BACHELOR IN INFORMATION TECHNOLOGY								
Year	**Sem**		**Subject**	**Course Code**	**Paper Title**	**Theory/Practical**	**Marks**	**Credit**
Third Year	**V**	**Major**	**I**	BIT-501	Python Programming	Theory	100 (25+75)	4
			II	BIT-502	Cryptography and n/w security	Theory	100 (25+75)	4
			III	BIT-503	Computer Graphics	Theory	100 (25+75)	4
			IV	BIT-504	Machine Learning	Theory	100 (25+75)	4
			v	BIT-505	Python Programming practical	Practical	100 (25+75)	4
		Minor/Elective	**VI**	BIT-506	Internet of Thing (IoT)	Theory	100 (25+75)	4
		Co-Curricular	**Co-C-5**				100 (25+75)	Qlfy.
		Industrial	**Ind-1**		Project/,Dissertation	Ind.Training	100 (25+75)	Qlfy.-4**
	VI	**Major**	**I**	BIT-601	Theory of Computation	Theory	100 (25+75)	4
			II	BIT-602	Computer Organization & Architecture	Theory	100 (25+75)	4
			III	BIT-603	C#.NET	Theory	100 (25+75)	4
			IV	BIT-604	Data Warehousing & Data mining	Theory	100 (25+75)	4
			V	BIT-605	C#.NET	Practical	100 (25+75)	4
		Minor/Elective	**VI**	BIT-606	Artificial Intelligence & Application	Theory	100 (25+75)	4
		Co-Curricular	**Co-C-6**					Qlfy.
		Industrial	**Ind-2**		Project/Dissertation	Ind.Training		Olfy-4**
							TOTAL	**52**

Detailed Curriculum

CERTIFICATE IN INFORMATION TECHNOLOGY

Programme Outcomes (POs):

At the end of the One year Certificate in IT, the students will be able to:

- Understand, analyze and develop algorithm, flow chart and computer programs, web pages, preparing project reports, presentation, spreadsheets and other documentations in future.

Programme Specific Outcomes (PSOs):

- Can be recruited in both (within) the country and in the global web development Companies.
- Will also be eligible to pursue IT Diploma.

CERTIFICATE IN INFORMATION TECHNOLOGY								
Year	**Sem**		**Subject**	**Course Code**	**Paper Title**	**Theory/Practical**	**Marks**	**Credit**
First Year	**I**	**Major**	**I**	BIT-101	Information Technology Fundamentals	Theory	100 (25+75)	4
			II	BIT-102	Problem solving Techniques with programming	Theory	100 (25+75)	4
			III	BIT-103	Digital Electronics	Theory	100 (25+75)	4
			IV	BIT-104	Mathematical Foundation of Computer Science	Theory	100 (25+75)	4
			V	BIT-105	Problem solving Techniques with programming	Practical	100 (25+75)	4
		Minor/Elective	**VI**	BIT-106	Office Automation Using PC Packages	Practical	100 (25+75)	4**
		Co-Curricular	**Co-C-1**		Communication Skills		100 (25+75)	Qlfy.
	II	**Major**	**I**	BIT-201	Data Structure Using C	Theory	100 (25+75)	4
			II	BIT-202	Internet Technologies	Theory	100 (25+75)	4
			III	BIT-203	Discrete Mathematics	Theory	100 (25+75)	4
			IV	BIT-204	Multimedia Technology	Theory	100 (25+75)	4
			V	BT-205	Data Structure Using C	Practical		4
		Minor/Elective	**VI**	BIT-206	Organization Behaviour	Theory	100 (25+75)	4**
		Co-Curricular	**Co-C-2**				100 (25+75)	Qlfy.
							TOTAL	48

First Semester

Programme/Class: (Certificate in Information Technology)	Year: First	Semester: First
Course Code: BIT-101	**Course Title: Computer Fundamentals & Information Technology**	

Course outcomes:

The Student at the completion of the course will be able to:

- Understand about the fundaments of computer ,types and its components, computer languages & its type.
- Understand about the information concepts and processing.
- Earn knowledge of different types of memory & networks.
- Know Operating system and different types of Operating system.

Credits: 5	**Major Core Compulsory**
Max. Marks:	**Min. Passing Marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	Fundamentals of Computers-Computer, Elements of computer, Generation of computers, Classification of Computers, Input & Output Devices ,Overview of Computer Hardware & Software, Memory.	15
II	What is an operating system, Types of Operating System with examples, Single user (MS-DOS) and Multiuser (UNIX), Functions of Operating System, Memo, Internal external DOS command , Introduction to Windows, Parts of Windows Screen- Desktop Icons. Windows, Anatomy of a Window, The Title Bar, Minimize and Maximize Button. The Control Box, Scroll Bars, Scroll Buttons and Scroll Boxes, Changing Screen Saver and Background Application and Document Windows, Changing Date and Time. My Computer, My Documents, Recycle Bin, Creating Folder, Windows Explorer, Searching, Moving Files, Copy, Delete and Rename Files, Creating Shortcuts.	15
III	INFORMATION CONCEPT & PROCESSING – Definition of information, need for information, quality of information, value of information, categories and levels of information in business organization.	10
IV	PROGRAMMING LANGUAGE CLASSIFICATION-Computer languages, generation of languages, translators-interpreters, compilers, assembles, introduction to 4gls.	10
V	INFORMATION TECHNOLOGY APPLICATION IN INDIA-Scientific business, education and entertainment application, industry automation, weather forecasting , media for data transmission, types of networking, client server architecture, NICNET, ERNET.	10

Suggested Readings: Book –

1. Introduction to information technology, ITL education solution limited, personal education.
2. P. K. Sinha & Priti Sinha: Computer Fundamentals (BPB)
3. Foundation of information technology by D S Yadav . New age publication ltd.
4. Introduction to computer by peter Norton TMH. Publication ltd

Suggested Digital PDF

Note: This Major (course paper) is compulsory for all students of Certificate in Information Technology

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: 10+2 with any subject

Programme/Class: (Certificate in Information Technology)	Year: First	Semester: First
Course Code: BIT-102	**Course Title: Problem solving Techniques with programming**	

Course outcomes:

The Student at the completion of the course will be able to:

- Illustrate the flowchart and designing an algorithm for a given problem to develop c programs.
- Learn how to apply logic for problems.
- To enable the students to develop logics and programs.
- Enhance their programming skills.
- Learn about Loops, Conditional statements, Array, Pointers, File Handling, Structure,Unions etc.

Credits:	**Core Compulsory (Major-Own/Other Faculty)**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 4-0-1

Unit	Topics	No. of Lectures
I	Introduction To Computer Problem Solving: Algorithms - Building blocks of algorithms (statements, control flow, functions) -Notation (pseudo code, flow chart), Simple strategies for developing algorithms (iteration, recursion), Complexity of algorithms.	15
II	Introduction to C: Features of C, Structure of C program, Tokens, Character set, identifiers and keywords, data types, constants, variables ,operators and expressions, preprocessor directives, formatted input, output, basic data types, type conversion, precedence and associativity of C operators	15
III	Control Structures: Decision making Statements - Simple if, if_else, nested if_else, else_if ladder, Switch Case, goto, break & continue statements; Looping Statements - Entry controlled and exit controlled statements, while, do-while, for loops, Nested loops.	15
IV	Functions: Library Function and user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type.	15
V	Derived data types in C: Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation. Strings: Declaring & Initializing string variables; String handling functions - strlen, strcmp, strcpy and strcat; Character handling functions - toascii, toupper, tolower, isalpha, isnumeric etc. Pointers and structures Structures and unions, defining and processing a structure.	15

Suggested Readings: Book –

1. The c programming language by Kernighan &Ritchie, PHI
2. Let us C by Yashawant kanetkar, BPB publication, New Delhi.
3. E. Balaguruswamy, Programming in ANSI C, 7th Edition, Tata McGraw-Hill
4. Programming in c by Dennis Ritchie , BPB Publication , New Delhi.

Suggested Digital PDF :

Note: This Major (course paper) is compulsory for all students of Certificate in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: 10+2 with any subject

Programme/Class: (Certificate in Information Technology)	Year: First	Semester: First
Course Code: BIT-103	**Course Title: Digital Electronics**	

Course outcome:

The Student at the completion of the course will be able to:

- Understand the concepts of Boolean algebra, logic gates and design digital logic circuits.
- Understand and design the combinational circuit such as adder, multiplexer, demultiplexer, encoder, decoder etc.
- Understand and design sequential circuit such as flip flops, counters etc

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	Number system and codes: Binary, octal, hexadecimal and decimal Number systems and their inter conversion, BCD numbers (8421-2421), gray code, excess–3 code, cyclic code, code conversion, ASCII, EBCDIC codes. Binary addition and subtraction, signed and unsigned binary numbers, 1's and 2's complement representation.	15
II	Boolean Algebra: Basic logic circuits: Logic gates (AND, OR, NOT, NAND, NOR, Ex-OR, ExNOR and their truth tables,), Universal Gates, Laws of Boolean algebra, De-Morgan's theorem, Min term, Max term, POS, SOP, KMap, Simplification by boolean theorems, don't care condition	15
III	Combinational Circuit: Half adder, full adder, subtractor circuit. Multiplxer, demultiplexer, encoders, decorder, BCD to seven segment Decorder	15
IV	Flip flop and Timing circuit : set-reset laches, D-flipflop, R-S flip-flop, J-K Flip-flop, Master slave Flip flop, edge triggered flip-flop, T flip-flop.	15
V	Counters and registers: Synchronous/Asynchronous counter operation, Up/down synchronous counter, application of counter, Serial in/Serial out shift register, Serial in/Serial out shift register, Serial in/parallel out shift register, parallel in/ parallel out shift register, parallel in/Serial out shift register, Bi-directional register.	15

Suggested Readings: Book –

1. Digital Fundamentals by Morris and Mano, PHI Publication
2. Fundamental of digital circuits by A.ANANDKUMAR,PHI Publication
3. Digital Fundamentals by FLOYD & JAIN, Pearsons Pub
4. Fundamentals of Logic Design by Charles H. Roth Thomson

Suggested Digital PDF :

Note: This Major (course paper) is compulsory for all students of Certificate in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: 10+2 with any subject

Programme/Class: (Certificate in Information Technology)	Year: First	Semester: First
Course Code: BIT-104	**Course Title: Mathematical Foundation of Computer Science**	

Course outcome:

The Student at the completion of the course will be able to:

- Understand the theory of Sets, Relations and functions.
- Understand and implement the Permutation and Combination, Matrices and Groups.

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	Set Theory and Relation: Sets and Elements, Subsets ,Venn Diagrams ,Set Operations , Algebra of Sets, Duality, Finite Sets, Counting Principle, Classes of Sets, Power Sets, Mathematical Induction. Relations, Pictorial Representatives of Relations, Composition of Relations, Types of Relations ,Closure Properties ,Equivalence Relations , Partial Ordering Relations	15
II	Functions: Definitions of functions, Classification of functions, Type of functions, Examples, Composition of functions, Inverse functions, Binary and n-ary operations, Characteristic function of a set, Hashing functions, Recursive functions, Permutation functions.	15
III	Matrix algebra: Introduction-Types of matrices, matrix operations, transpose of a matrix, determinant of matrix , inverse of a matrix, Cramer's rule, Eigen values	15
IV	Permutation and Combination - Mathematical Induction - Pigeon hole principle - Principle of Inclusion and Exclusion - generating function - Recurrence relations.	15
V	Groups: Algebraic systems, Definitions, Examples, Properties, Semigroups, Monoids, Homomorphism, Sub semigroups and Submonoids, Cosets and Lagrange's theorem, Normal subgroups, Normal algebraic system with two binary operations, Codes and group codes, Basic notions of error correction, Error recovery in group codes.	15

Suggested Readings: Book –

1. Discrete Mathematics (Schaum's Outlines)" by Seymour Lipschutz and Marc Laras Lipson
2. B. S. Vatsa-Discrete Mathematics –New Age International Limited Publishers, New Delhi

Suggested Digital PDF :

Note: This Major (course paper) is compulsory for all students of Certificate in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: 10+2 with any subject

Programme/Class: (Certificate in Information Technology)	Year: First	Semester: First
Course Code: BIT 105	Course Title : Problem solving Techniques with programming	

Course Outcomes:

The Student at the completion of the lab course will be able to:

- Understand the logic for a given problem.
- Recognize and understand the syntax and construction of C programming code.

Credits:4	Minor/Elective
Max. Marks: 25+75	Min. Passing marks: 33

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 0-0-4

S.No	Topics	
1.	Write a program to calculate simple and compound interest.	
2.	Write a program to swap values of two variables with and without using third variable.	
3.	Write a program to find the largest and smallest among three entered numbers and also display whether the identified largest/smallest number is even or odd.	
4.	Write a program to find the roots of quadratic equation.	
5.	Write a program to input name, marks of 5 subjects of a student and display the name of the student, the total marks scored, percentage scored and the class of result.	
6.	Write a Program to Check Whether a Number is Prime or not.	
7.	Write a program to find the factorial of a number.	
8.	Write a program to check number is Armstrong or not. (Hint: A number is Armstrong if the sum of cubes of individual digits of a number is equal to the number itself).	
9.	Write a program to check whether a number is Palindrome or not.	
10.	Write a program to generate Fibonacci series.	
11.	Write a program to find GCD (greatest common divisor or HCF) and LCM (least common multiple) of two numbers.	

12.	Program: Write a program to display the following pattern. a). * * * * * * * * * * * * * * * * * * * b). * * * * * * * * * * * * * * * * * * * **c).** d). * e). 1111111 22222 333 4 f). A B B C C C D D D D E E E E E	
13.	Write a Program to Search and also sort an element in array	
14.	Write a program for addition and multiplication of two Matrices.	
15.	Write a program to read a string and check for palindrome without using string related function (a string is palindrome if its half is mirror by itself eg: abcdcba).	
16.	Write a program to accept a string and find either the character is vowel or not and also count the number of vowels present in this string	
17.	Write a program to add, subtract, multiply and divide two integers using userdefined type function with return type.	
18.	Write a program to calculate sum of first 20 natural numbers using recursive function.	
19.	Write a program to swap two integers using call by value and call by reference methods of passing arguments to a function.	
20.	Write a program to find sum of digits of the number using Recursive Function.	
21.	Write a program to read an integer number and print the reverse of that number using recursion.	
22.	Write a program to find the sum of all the elements of an array using pointers.	
23.	Write a program to swap value of two variables using pointer.	
24.	Write a program to create a structure named company which has name, address, phone and noOfEmployee as member variables. Read name of company, its address, phone and noOfEmployee. Finally display these members‟ value.	
Suggested Readings:		
Note: This Minor Elective (course paper) is compulsory for all students of Information Technology Course.		

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/test with MCQs/short & long questions, attendance and participation in the class.
Course pre requisite: 10+2 with any subject

Programme/Class: (Certificate in Information Technology)	Year: First	Semester: First
Course Code: BIT-106	**Course Title : Office Automation Using PC Packages**	

Course Outcomes:

The Student at the completion of the course will be able to:

- Learn the various word processing features which is very helpful in preparing project reports and other documentations in future.
- Learn the features of electronic spreadsheets which is a prerequisite in any global market.
- Learn the skills of giving professional presentations which is an absolute necessity of the current

Credits:	**Minor/Elective**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 4-0-1

Unit	Topics	No. of Lectures
I	Introduction to Office Automation Suit, Elements of Office Suit & Area of Use. WordProcessing, Spreadsheet, Presentation Graphics, Database. Introduction of various Office Suites Open Office, Libre Office, WPS Office, Microsoft Office. Word Basics Using MS Office : Starting Word Processor, The parts of a Word Processor Window, Menus & Commands, Toolbars & Buttons, Shortcut Menus, Creating a New Document, Different Page Views and Layouts, Applying various Text Enhancements, Formatting Text and Documents: Auto Format, Text Attributes, Paragraph and Page Formatting, Line Spacing, Margins, Borders and Shading, Tabs and Indents, Text Editing using various features, Bullets, Numbering, Working with Styles, Printing & various print options, Spell Check ,Working with Headers and Footers, Tables: Creating a Simple Table, Creating a Table using the Table Menu, Entering and Editing Text in a Table, Selecting in Table, Adding Rows, Changing Row Heights, Deleting Rows, Inserting Columns, Deleting Columns, Changing Column Width.	15
II	Graphics: Clipart, Insert Picture, Using Drawing Features, Drawing Objects, Text in Drawing. Templates: Template Types, Using Templates, Exploring Templates, Modifying Templates. Macros: Macro, Recording Macros, Editing Macros, Running a Macro. Mail Merge: Mail Merge Concept, Main Document, Data Sources, Merging Data Source and Main Document.	15
III	Spreadsheet Basics: Overview of Spreadsheet, Features, Creating a New Worksheet, Selecting Cells, Entering and Editing Text, Entering and Editing Numbers, Entering and Editing Formulas, Referencing Cells, Moving Cells, Copying Cells, Sorting Cell Data, Inserting Rows, Columns, Inserting Cells, Deleting Parts of a Worksheet, Clearing Parts of a Worksheet. Formatting: Page Setup, Changing Column Widths and Row Heights, Auto Format, Changing Font Sizes and Attributes, Using Border Buttons and Commands, Changing Colors and Shading, Hiding Rows and Columns.	15
IV	Function in Spreadsheet, Functions by category: Date and Time functions, Engineering functions, Math and Trigonometry functions, Statistical functions, Text functions. Spreadsheet Charts: Chart parts and Terminology, Instant Charts with the Chart Wizard, Creation of different types of Charts, Printing Charts, Deleting Charts, L:inking in Spreadsheet. Spreadsheet Graphics: Creating and Placing Graphic Objects, Resizing Graphics, Drawing Lines and Shapes.	15
V	Creating Presentations: Using Blank Presentation Option, Using Design Template , Adding Slides, Deleting a Slide, Importing Images from Outside, Transition and Build Effects, Deleting a Slide, Numbering a Slide, Saving Presentation, Closing Presentation, Printing Presentation .	15

Suggested Readings:

1. Microsoft Office Ste by Step Beth Melton,Mark Dodge , Published with the authorization of Microsoft Corporation by: O'Reilly Media.
2. Office 2013 Bible: The Comprehensive Tutorial Resource Paperback – by Lisa A. Bucki (Author), John Walkenbach (Author), Michael Alexander.
3. Learning Microsoft Office 2013 by Ramesh Bangia, Khanna Publishers

Note: This Minor Elective (course paper) is compulsory for all students of Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/test with MCQs/short & long questions, attendance and participation in the class.
Course pre requisite: 10+2 with any subject

Co-Curricular: 1
Communication Skills
(Syllabus as prescribed by University)

Second Semester

Programme/Class: (Certificate in Information Technology)	**Year: First**	**Semester: Second**
Course Code: BIT-201	**Course Title: Data Structure Using C**	

Course outcomes:

The Student at the completion of the course will be able to:

- Develop basic understanding of Data Structure.
- Understand arrays, link list, various types of queue, stack, tree and graphs.
- Develop programming logic and skills.

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 4-0-1

Unit	Topics	No. of Lectures
I	Introduction to data structures: Definition; Types of data structures - Primitive & Non-primitive, Linear and Non-linear; Operations on data structures. Dynamic memory allocation: Static & Dynamic memory allocation; Memory allocation and de-allocation functions - malloc, calloc, realloc and free.	15
II	Arrays: Basic Concepts – Definition, Declaration, Initialisation, Operations on arrays; Types of arrays; Arrays as abstract data types (ADT); Representation of Linear Arrays in memory; Traversing linear arrays; Inserting and deleting elements; Multidimensional arrays; Representation of multidimensional arrays; Sparse matrices. Sorting and searching Selection sort, Bubble sort, Quick sort, Selection sort, Insertion sort; Searching - Sequential Search, Binary search	15
III	Stacks: Definition and Representation of stacks; Operations on stacks; Applications of stacks; Infix, postfix and prefix notations; Conversion from infix to postfix using stack; Evaluation of postfix expression using stack; Application of stack in function calls. Queues: Definition and Representation of queues; Types of queues - Simple queues, Circular queues, Double ended queues, Priority queues; Operations on Simple queues	15
IV	Linked list: Basic Concepts – Definition and Representation of linked list, Types of linked lists - Singly linked list, Doubly liked list, Header liked list, Circular linked list; Representation of Linked list in Memory; Operations on Singly linked lists – Traversing, Searching, Insertion, Deletion	15
V	Trees: Definition; Tree terminologies –node, root node, parent node, ancestors of a node, siblings, terminal & non-terminal nodes, degree of a node, level, edge, path, depth; Binary tree: Type of binary trees - strict binary tree, complete binary tree, binary search tree and heap tree; Traversal of binary tree; preorder, inorder and postorder traversal.	15

Suggested Readings: Book –

1. Tanenbaum: Data structures using C (Pearson Education)
2. Kamathane: Introduction to Data structures (Pearson Education)
3. Y. Kanetkar: Data Structures Using C (BPB)
4. Data Structures through C in Depth by S.K. Srivastava & Deepali Srivastava

Suggested Digital PDF :

Note: This Major (course paper) is compulsory for all students of Certificate in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: 10+2 with any subject

Programme/Class: (Certificate in Information Technology)	Year: First	Semester: Second
Course Code: BIT-202	**Course Title: Internet Technology**	

Course outcomes:

The Student at the completion of the course will be able to:

- Understant the HTML, XHTML, XML, CSS, Java Script.
- To develop Webpages, Static Websites, Dynamic Websites.

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 4-0-1

Unit	Topics	No. of Lectures
I	Introduction to WWW : Protocols and programs, secure connections, application and development tools, the web browser, Web Design: Web site design principles, planning the site and navigation.	15
II	Introduction to HTML : The development process,Html tags and simple HTML forms, web site structure Introduction to XHTML : XML, Move to XHTML, Meta tags, Character entities, frames and frame sets, inside browser.	15
III	Style sheets : Need for CSS, introduction to CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS	15
IV	Javascript : Client side scripting, What is Javascript, How to develop Javascript, simple Javascript, variables, functions, conditions, loops and repetition DHTML : Combining HTML, CSS and Javascript, events and buttons, controlling your browser	15
V	XML : Introduction to XML, uses of XML, simple XML, XML key components, DTD and Schemas, Well formed, using XML with application.XML, XSL and XSLT. Introduction to XSL, XML transformed simple example, XSL elements, transforming with XSLT	15

Suggested Readings:

1. Steven Holzner,"HTML Black Book" Dremtech press.
2. Web Technologies, Black Book, dreamtech Press
3. Web Applications : Concepts and Real World Design, Knuckles, Wiley-India
4. Internet and World Wide Web How to program, P.J. Deitel & H.M. Deitel. Pearson.

Suggested Digital PDF :

Note: This Major (course paper) is compulsory for all students of Certificate in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: 10+2 with any subject

Programme/Class: (Certificate in Information Technology)	Year: First	Semester: Second
Course Code: BIT-203	**Course Title: Discrete Mathematics**	

Course outcome:

The Student at the completion of the course will be able to:

- Understand the propositional logics, Boolean algebra and circuit, graph theory, Ordered set and lattices.

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	Propositional Calculus: Propositions, Truth tables, Logical Equivalence, Logical implications, Algebra of propositions, Conditional propositions, Bi-conditional statements, Negation of Compound statements, Tautologies and Contradiction, Normal Form, Arguments, Fallacies.	15
II	Boolean algebra and Circuits: Boolean Expression, Logic Gates, Logic Circuits, Boolean Functions, Sum of Product and Product of Sum Forms, Canonical Forms, Simplification of functions using K-Map.	15
III	Graph Theory Graphs and Multigraphs, Subgraphs, Isomorphic and Homeomorphic Graphs, Paths, Connectivity, Traversable and Eulerian Graphs, Labeled and Weighted Graphs, Complete, Regular, and Bipartite Graphs , Planar Graphs, Graph Colorings	15
IV	Directed Graphs Definitions, Rooted Trees, Sequential Representation of Directed Graphs, Warshall's Algorithm, Shortest Paths , Graph Algorithms: Depth-First and Breadth-First Searches, Directed Cycle-Free Graphs, Topological Sort	15
V	Ordered Sets and Lattices: Ordered Sets ,Hasse Diagrams of Partially Ordered Sets ,Supremum and Infimum,Lattices,Bounded Lattices, Distributive Lattices, Complements, Complemented Lattices.	15

Suggested Readings:

1. Discrete Mathematics (Schaum's Outlines)" by Seymour Lipschutz and Marc Laras Lipson
2. B. S. Vatsa-Discrete Mathematics –New Age International Limited Publishers, New Delhi

Suggested Digital PDF:

Note: This Major (course paper) is compulsory for all students of Certificate in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: 10+2 with any subject

Programme/Class: (Certificate in Information Technology)	Year: First	Semester: Second
Course Code: BIT-204	**Course Title : Multimedia Technology**	

Course Outcomes:

The Student at the completion of the course will be able to:

- Define what is Multimedia and how it works.
- Understand multimedia components using various tools and techniques.
- Analyze and interpret Multimedia data.
- Discuss about different types of media format and their properties.
- Justify the right way of manipulating multimedia systems.

Credits:4	**Minor/Elective**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	Introduction Introduction to Multimedia, Multimedia objects, Multimedia in business & work.Multimedia Hardware, Memory & Storage Devices, Communication devices, multimediasoftwares, presentation tools, tools for object generations, video, sound, image capturing, authoring tools card and page based authoring tools.	15
II	Multimedia Building Blocks Text, sound, MIDI, Digital Audio, audio file formats, MIDI under windows environment, Audio & video Capture.	15
III	Speech Compression & Synthesis: Digital Audio concepts , Sampling variables, Lossless compression of sound, lossy compression & silence compression.	15
IV	Images Multiple monitors, bitmaps, vector drawing, lossy graphic compression, image file formation animation, Images standards, JPEG Compression, Zig Zig Coding.	15
V	Video Video representation , Colors, Video compression, MPEG standard, MHEG Standards, recent development in Multimedia.	15

Suggested Readings:

1. Tay Vaughan "Multimedia, Making it work," Osborne Hill
2. Buford, "Multimedia Systems," Addison Wesley
3. Mark Nelson "Data Compression Book", BPB
4. Rosch, "Multimedia Bible", Sams publishing

Note: This Major (course paper) is compulsory for all students of Certificate in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisite: 10+2 with any subject

Programme/Class: (Certificate in Information Technology)	Year: First	Semester: Second
Course Code: BT-205	Course Title : Data Structure Using C	

Course Outcomes:

The Student at the completion of the lab course will be able to:

- Implement different sorting and searching algorithms.
- Implement the stack, Queue and their applications.
- Implement various types of linked lists and their applications.

Credits:4	Minor/Elective
Max. Marks: 25+75	Min. Passing marks: 33

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 0-0-4

S.No.	Topics	
1.	Write a program in C to implement 1D array and different operations in an array.	
2.	Write a program in C to implement 2D array and different operations in an array.	
3.	Write a program in C to implement the Stack and PUSH POP operations using array.	
4.	Write a program in C to implement the Stack and PUSH POP operations using queue.	
5.	Write a program in C to implement the reverse of string using stack.	
6.	Write a program in C to implement Decimal to Binary Conversion using stack.	
7.	Write a program in C to implement the Stack using queue	
8.	Write a program in C to implement queue and its operations.	
9.	Write a program in C to implement circular queue and its operations.	
10.	Write a program in C to implement singly linked list and its operations.	
11.	Write a program in C to implement insertion sort.	
12.	Write a program in C to implement selection sort.	
13.	Write a program in C to implement bubble sort.	
14.	Write a program in C to implement quick sort.	
15.	Write a program in C to implement merge sort.	
16.	Write a program in C to implement linear search.	
17.	Write a program in C to implement binary search.	

Suggested Readings:
Note: This Minor Elective (course paper) is compulsory for all students of Information Technology Course.
Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/test with MCQs/short & long questions, attendance and participation in the class.
Course pre requisite: 10+2 with any subject

Programme/Class: (Certificate in Information Technology)	Year: First	Semester: Second
Course Code: BIT-206	Course Title : Organization Behavior	

Course Outcomes:

The Student at the completion of the course will be able to:

- Understand the conceptual framework of the discipline of OB and its practical applications in the organizational set up.
- To deeply understand the role of individual, groups and structure in achieving organizational goals effectively and efficiently.
- To critically evaluate and analyze various theories and models that contributes in the overall understanding of the discipline.
- To develop creative and innovative ideas that could positively shape the organizations.
- To accept and embrace in working with different people from different cultural and diverse background in the workplace.

Credits:	Minor/Elective
Max. Marks:	Min. Passing marks:

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	Fundamentals of Organizational Behaviour: Nature, Scope, Definition and Goals of Organizational Behaviour, Fundamental Concepts of Organizational Behaviour, Models of Organizational Behaviour, Emerging aspects of Organizational Behaviour: TQM, Managing Cultural Diversity, Managing the Perception Process	15
II	Attitude Values and Motivation: Effects of employee attitudes Personal and Organizational Values Job Satisfaction Nature and Importance of Motivation Achievement Motive Theories of Work Motivation: Maslow's Need Hierarchy Theory, McGregor's Theory 'X' and Theory 'Y'	15
III	Personality: Definition of Personality, Determinants of Personality Theories of Personality – Trait and Type Theories, The Big Five Traits, Myers-Briggs Indicator, Locus of Control, Type A and Type B Assessment of Personality	15
IV	Work Stress: Meaning and definition of Stress, Symptoms of Stress Sources of Stress: Individual Level, Group Level, Organizational Level Stressors, Extra Organizational Stressors Effect of Stress – Burnouts Stress Management – Individual Strategies, Organizational Strategies Employee Counselling	15
V	Group Behaviour and Leadership: Nature of Group, Types of Groups Nature and Characteristics of team building, Effective Teamwork Nature of Leadership, Leadership Styles Traits of Effective Leaders	15

Suggested Readings:

1. Organizational Behavior Text, Cases and Games- By K. Aswathappa, Himalaya Publishing House, Mumbai, Sixth Edition (2005)

2. Organizational Behavior Human Behavior at Work by J. W. Newstrom, Tata McGraw Hill Publishing Company Limited, New Delhi, 12 th Edition (2007)

Note: This Minor Elective (course paper) is compulsory for all students of Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/test with MCQs/short & long questions, attendance and participation in the class.
Course pre requisite: 10+2 with any subject

Co-Curricular:2
Environment Studies And Value Education
(Syllabus as prescribed by University)

Detailed Curriculum
DIPLOMA IN INFORMATION TECHNOLOGY

Programme Outcomes (POs):

At the end of the Two year Diploma in IT (After completion one year Certificate in IT), the students will be able to:

- Understand, analyze and develop computer programs in the areas related to algorithm, web design and networking for efficient design of computer based system.
- The program prepares the young professional for a range of computer applications, computer organization, Computer Networking, Software Engineering, Web development, Database management and Java

Programme Specific Outcomes (PSOs):

- Can be work in the IT sector as system engineer, software tester, junior programmer, web developer, database administrator, software developer etc.
- Will also be eligible to pursue Bachelor in IT.

COURSE STRUCTURE								
DIPLOMA IN INFORMATION TECHNOLOGY								
Year	**Sem**		**Subject**	**Course Code**	**Paper Title**	**Theory/Practical**	**Marks**	**Credit**
Second Year	**III**	**Major**	**I**	BIT-301	PHP & MySQL	Theory	100 (25+75)	4
			II	BIT-302	Database Management System	Theory	100 (25+75)	4
			III	BIT-303	Optimization Technique	Theory	100 (25+75)	4
			IV	BIT-304	Computer Communication & Networks	Theory	100 (25+75)	4
			v	BIT-305	PHP & MySQL	Practical	100 (25+75)	4
		Minor/Elective	**VI**	BIT-306	Cyber Security and Cyber Law	Theory	100 (25+75)	4**
		Co-Curricular	**Co-C-3**				100 (25+75)	Qlfy.
	IV	**Major**	**I**	BIT-401	JAVA Programming	Theory	100 (25+75)	4
			II	BIT-402	Software Engineering	Theory	100 (25+75)	4
			III	BIT-403	Operating System	Theory	100 (25+75)	4
			IV	BIT-404	E-commerce	Theory	100 (25+75)	4
			v	BIT-405	JAVA Programming	Practical	100 (25+75)	4
		Minor/Elective	**VI**	BIT-406	Cloud Computing Tools And Techniques	Theory	100 (25+75)	4**
		Co-Curricular	**Co-C-4**				100 (25+75)	Qlfy.
							TOTAL	48

Third Semester

Programme/Class: **(Diploma in Information Technology)**	**Year: Second**	**Semester: Third**
Course Code: BIT-301	**Course Title: PHP & MySql**	
Course outcomes: The Student at the completion of the course will be able to: • Understand the server side scripting language, PHP • Understand the PHP Get and Post methods working difference • Develop knowledge of MySQL commands • Use PHP to access a MySQL database		
Credits:	**Major Core Compulsory**	
Max. Marks:	**Min. Passing marks:**	
Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 4-0-1		

Unit	**Topics**	**No. of Lectures**
I	Introduction to PHP: Web Architecture , PHP language building blocks Comparing PHP with other Web scripting languages or technology, Installation of PHP, PHP delimiters, Variable initialization with PHP, PHP Data types, PHP Constants, PHP Operators, Conditional Statements If, If else, If else if else, Nested If else, Switch Case, Jump Statements (Break , Continue , Exit), Looping (Iteration) For loop, While loop, Do while loop, Nested Loop.	15
II	Introducing Array How to use an important programming construct: arrays, Numerically Indexed arrays, Non-Numerically Indexed arrays (Associative Array), Multidimensional arrays, Array sorting	15
III	Manipulation user input Presenting the user with input options via different HTML form elements, Retrieving form data with $_POST,$_GET and $_REQUEST arrays, Preserving Data in Form inputs.	15
IV	Functions Defining functions, Using parameters, Understanding scope, Returning values, Call By Value & Call By reference , Using Require() and include(), Array , String , Math , Date functions	15
V	MySQL Database: Introduction to DBMS and Mysql, Creating a MySQL Database, Creating Database Tables, Column Data Types, Implementing Insert/Delete/Update and select Query, Aggregate Functions, Having and Group By Clause, Joining Table, Implementing Keys & Constraint, Dropping Tables and Databases, Mysql database connectivity.	15

Suggested Readings: Book

1. PHP: The Complete Reference, Steven Holzner , McGraw Hill Education
2. Learning PHP, MySQL & Java Script, Robin Nixon, O'Reilly
3. Head First PHP & MySQL, Lynn Beighley, O'Reilly

Suggested Digital PDF :

Note: This Major (course paper) is compulsory for all students of Certificate in Information Technology Course..

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: 10+2 with any subject

Programme/Class: (DIPLOMA IN INFORMATION TECHNOLOGY)	Year: Second	Semester: Third
Course Code: BIT-302	**Course Title: Database Management System**	

Course outcomes:

- Understand the Database Architecture & Models of Database.
- Understand the concept of RDBMS.
- Understand, write and execute DDL,DML,DCL SQL statements.

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 4-0-1

Unit	Topics	No. of Lectures
I	DBMS Definition – Characteristics of DBMS – Application and advantages of DBMS– Instances – Schemas and Database States – Three Levels of Architecture – Data Independence – DBMS languages– Data Dictionary– Database Users– Data Administrators.	15
II	Data Models– types and their comparison– Entity Relationship Model– Entity Types– Entity Sets– Attributes and its types– Keys– E-R Diagram– Data Integrity– RDBMS :Concept– Components and Codd's rules.	15
III	Relational Algebra (selection, projection, union, intersection, Cartesian product, Different types of join like theta join–equi-join, natural join, outer join) Functional Dependencies, Anomalies, Normalization: 1NF, 2NF, 3NF, BCNF, 4NF 5NF.	15
IV	Introduction to SQL, DDL, DML, and DCL statements– Creating Tables– Adding Constraints– Altering Tables, Update, Insert, Delete Tables & various Form of SELECT-Simple, Using Special Operators for Data Access– Aggregate functions– Joining Multiple Tables (Equi Joins) – Joining a Table to itself (self Joins) Functions.	15
V	Introduction to PL/SQL (blocks of PL/SQL, Variables, constants) ,Control Structure ,Stored Procedures ,Cursor and Triggers	15

Suggested Readings :

1. H. F. Korth & A. Silverschatz, Database Concepts, Tata McGraw Hill, New Delhi
2. C. J. Date, Database Systems, Prentice Hall of India, New Delhi.
3. Ivan Bayross, SQL, PL/SQL, The programming language of Oracle.

Suggested Digital PDF :

Note: This Major Course Paper is compulsory for all students of Diploma in Information Technology.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Certificate Course.

Programme/Class: (DIPLOMA IN INFORMATION TECHNOLOGY)	Year: Second	Semester: Third
Course Code: 303	**Course Title: Optimization Techniques**	

Course outcomes: The Student at the completion of the course will be able to:

- Understand and solve the problem using LPP, Simplex method, Replacement problem, Transportation and Assignment Problem, Queuing Theory and Games Theory

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures

I	Introduction: Formulation and Graphical solution of L.P.P (two variables), limitations and advantages of L.P Simplex Method: Slack and surplus variables, B.F.S from F.S Simplex method for L.P.P(Three variables).	15
II	Replacement Problem: Replacement of Items when time is continuous and discrete.	15
III	Queuing Theory: Queuing process, input process, servicing facility, distribution of arrivals 7 service time.	15
IV	Transportation and Assignment Problem: Mathematical formulation, NorthWeat corner rule, Lowest cost entry method, Unit cost penalty method, Assignment problem.	15
V	Games Theory: Pay off matrix, Pure & mixed strategy, Saddle point, 2*2 game without saddle point, 2*n game, graphical method for 2*n & n*2 game.	15

Suggested Readings :

1. Tara, H.A Operation Research McMillan
2. Srinath, L.S Linear Programming East west Pub

Suggested Digital PDF :

Note: This Major Course Paper is compulsory for all students of Diploma in Information Technology.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Certificate Course.

Programme/Class: (DIPLOMA IN INFORMATION TECHNOLOGY)	Year: Second	Semester: Third
Course Code: BIT-304	Course Title: Computer Communication & Networks	

Course outcomes:

The Student at the completion of the course will be able to:

- Understand the data communication concepts.
- Understand the OSI and TCP/IP Model and working of its different layers.

Credits:	Major Core Compulsory
Max. Marks:	Min. Passing marks:

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	Introduction: Goals and Applications of Networks, Network structure and architecture, services, network topology , OSI reference model, TCP/IP Model, Physical Layer-transmission, switching methods	15
II	Medium access sub layer: Channel allocations, LAN protocols, ALOHA Protocols- Pure ALOHA, slotted ALOHA, Carrier Sense Multiple Access Protocols, CSMA with Collision Detection, Collision free Protocols, IEEE standards, Ethernet, Error correction & detection algorithms, elementary data link layer protocols, sliding window protocols, error handling.	15
III	Network Layer: Point-to Point networks, concept of virtual circuit and LAN, routing algorithms, congestion control algorithms, internetworking, TCP/IP protocol, UDP, SCTP, IP addresses, classfull and classless addressing, Subneting,IPV4, IPv6 Packet Format	15
IV	Transport Layer: Design issues, connection management, Internet Transport Protocol (UDP), Ethernet transport Protocol, Transmission Control Protocol. (TCP).	15
V	Application Layer: Domain Name System, Simple Network Management Protocol, Electronic mail, File Transfer Protocol, Hyper Text Transfer Protocol, Introduction to Cryptography and Network Security Communication Security (IPSec, Firewalls).	15

Suggested Readings :

1. Computer Networks by A. S Tanenbaum, 4 thEdition", Pearson education
2. Data and Computer Communication by W. Stallings, Macmillan Press
3. Computer Networks & Internet with Internet Applications by Comer PearsonEducation
4. Internetworking with TCP/IP by PHI
5. Data Communication and Networking by Forouzan TMH

Suggested Digital PDF :

Note: This Major Course Paper is compulsory for all students of Diploma in Information Technology.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Certificate Course.

Programme/Class: (Diploma in Information Technology)	Year: Second	Semester: Third
Course Code: BIT-305	Course Title : PHP & MySQL	

Course Outcomes:

The Student at the completion of the lab course will be able to:

- Use Building Blocks of PHP and different types of arrays and functions.
- Working with Forms, Sessions, Cookies.
- Working with Files and Forms
- Use Interacting with MySQL using PHP.

Credits:4	Minor/Elective
Max. Marks: 25+75	Min. Passing marks: 33

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 0-0-4

S.No.	Topics	
1.	Create a PHP program to find odd or even number from given number.	
2.	Write a PHP program to find maximum of three numbers.	
3.	Write a PHP program to swap two numbers.	
4.	Write a PHP Program to demonstrate the variable function.	
5.	Write a PHP Program to demonstrate the string function.	
6.	Write a PHP program that demonstrate form element(input elements).	
7.	Write a PHP program that demonstrate passing variable using URL.	
8.	Write a PHP program that demonstrates use of session.	
9.	Write a program that demonstrates use of cookies.	
10.	Write a PHP program to create a database using MySQL.	
11.	Write a PHP program to drop a database using MySQL.	
12.	Write a PHP program to insert record into a table using MySQL.	
13.	Write a PHP program to drop table using MySQL.	
14.	Write a program to update table using MySQL.	
15.	Write a PHP program to select data and show into table format.	
16.	Write a PHP program to Create a student Registration in PHP and Save and Display the student Records.	

17.	Write a program to read customer information like c_no, c_name, item_purchased and mob_no from customer table and display all this information in table format on output screen.	
18.	Write PHP code to upload image.	
19.	Write a program that keeps track of how many times a visitor has loaded the page.	

Suggested Readings:

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Note: This Minor Elective (course paper) is compulsory for all students of Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisite: 10+2 with any subject

Programme/Class: (Diploma in Information Technology)	Year: Second	Semester: Third
Course Code: BIT-306	**Course Title : Cyber Security and Cyber Law**	

Course Outcomes:

The Student at the completion of the course will be able to:

- Analyze and evaluate the cyber security needs of an organization.
- Understand the cyber space, cyber crime and cyber law.

Credits:	**Minor/Elective**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	Information security: overview, information security importance, information security components. Threats to information system- external and internal thread, security threat and vulnerability- overview, malware, type of malware: virus, worms, trojans, rootkits, adware's, spywares, ransom wares, zombies etc., desktop security	15
II	Application security- database security, e- mail security, internet security, principles of security- confidentiality, integrity, availability, introduction to cryptography- symmetric key cryptography, asymmetric key cryptography, message authentication, applications of cryptography. Security technology- firewall, type of firewall, firewall benefits, VPN, antivirus software	15
III	Cyberspace- cloud computing &security, social network sites security, attack preventionpasswords, protection against attacks in social media, securing wireless networks, security threats	15
IV	Cybercrime-concept of cybercrime, type of cybercrime, phishing, cyber crime prevention, case study, security threats to e- commerce- electronic payment system, Digital Signature– digital signature process.	15
V	Cyber law- cyber law in India, IT act 2000, intellectual property rights- definition, intellectual property, categories of intellectual property, rights protected under intellectual property, copyright, patent and trademark, design- design law in India	15

Suggested Readings:

1. Allan Friedman and P. W. Singer, Cyber Security and Cyber war: What Everyone Needs to Know by Published Oxford University
2. Don Franke, Cyber Security Basics: Protect Your Organization by Applying the Fundamentals by Publisher CreateSpace Independent Publishing Platform, 2016
3. Mayank Bhushan, Fundamental of Cyber Security

Note: This Minor Elective (course paper) is compulsory for all students of Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisite: 10+2 with any subject

Co-Curricular:3

Management Paradigms from Bhagavad Gita

(Syllabus as prescribed by University)

Fourth Semester

Programme/Class: (DIPLOMA IN INFORMATION TECHNOLOGY)	**Year: Second**	**Semester: Fourth**
Course Code: BIT-401	**Course Title: JAVA Programming**	
Course outcomes: The Student at the completion of the course will be able to: • Understand Java Basics and use the java SDK environment to create , debug and run simple java program. • Implements the object-oriented concepts using Java. • Develop Java applets.		
Credits:	**Major Core Compulsory**	
Max. Marks:	**Min. Passing marks:**	
Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 4-0-1		

Unit	**Topics**	**No. of Lectures**
I	Introduction to Java Procedure Vs Object oriented Programming with reference to OOPS principles, History of Java, Java features, JDK, JVM, Hello world program in Java, Compilation Using Java and execution using Java.	15
II	Data types, Tokens in java Tokens of Java, Data types in Java with size and range, simple, floating, Boolean etc. Type conversions, Type casting, declaring variables, Arrays in Java Simple programs in Java base on variables and constants.	15
III	Java Operators Arithmetic Operators, Relational, Logical, Bitwise, Boolean operators and their use in Java programs. Control Statement in Java Loops (for, while, do- while), Decision making statement (If- then- end if), nested If, Nested Loops, Switch- case and sample programs .	15
IV	Object Oriented Programming In Java Concept of Class and objects in java, Java Class creation, scope Identifiers, java methods, object and use of methods by objects, sample class based programs in java, method overloading in Java, Abstract class and it's use, java Constuctors.	15
V	Inheritance & Multithreading in Java Define Inheritance, Types of inheritance in Java and use in Programs, interface, Super class, Method overriding, Java Thread model, native methods of threads class. Implementation of threads in java, Simple Applet programming in Java.	15

Suggested Readings :

1. Complete reference Java by Herbert Schildt(5th edition)
2. Java 2 Programming Black Book, Steven Horlzner
3. Programming with java, a Primer, 4th edition, By E Balgurusamy

Suggested Digital PDF :

Note: This Major Course Paper is compulsory for all students of Diploma in Information Technology.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Certificate Course.

Programme/Class: (DIPLOMA IN INFORMATION TECHNOLOGY)	Year: Second	Semester: Fourth
Course Code: BIT-402	**Course Title: Software Engineering**	

Course outcomes:

The Student at the completion of the course will be able to:

- Select and implement different software development process models.
- Extract and analyze software requirements specifications for different projects.
- Analyze problems, and identify and define the computing requirements appropriate to its solution.
- Apply design and development principles in the construction of software systems of varying complexity .
- Apply different testing and debugging techniques and analyzing their effectiveness.

Credits:	Major Core Compulsory
Max. Marks:	Min. Passing marks:

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	Introduction to Software Engineering ,The Evolving Role of Software, Definition & Concept Software Engineering ,Software Characteristics , Software Applications, Software Evolution, Software Crisis & Horizon, Software Myths	15
II	Software Development Life Cycle(SDLC)and Methodologies: Introduction, Activities of SDLC, A Generic Process Model ,Prescriptive Process models, Waterfall Model ,Incremental Process Models, Evolutionary process Models (Prototyping and Spiral Model), Concurrent Models, Types.	15
III	Software Requirement Analysis and Specifications: Software Requirement Specifications, Need of SRS, Steps for constructing good SRS, Behavioral and Non-Behavioral requirements, Analysis Model Design Concepts & Principle, top down and bottom up-design, Cohesion & Coupling, Function Oriented Design, DFDs, Structure Chart, Object Oriented Design. Analysis and Design Tools: Decision Tree and Decision Table, Data Flow Diagrams (DFD), Data Dictionary (DD), Elements of DD, Advantages of DD, Input and Output Design, Pseudo Code	15
IV	Coding: Top-Down and Bottom-Up programming, Structured programming, Programming style, Do's and Don'ts for Coding. Software Testing: Validation and Verification, Black Box testing approach, White Box testing approach, Levels of testing: Unit Testing, Integration Testing, Validation testing, System testing and debugging.	15
V	Software Maintenance: Software Maintenance Process and its types, Introduction to Reverse Engineering. Software Reliability & Quality Assurance: Software Reliability issues, Software quality, Overview of Quality Standards like ISO 9001, SEI-CMM and its comparison with ISO, Introduction, scope and architecture of CASE.	15

Suggested Readings :

1. Ian Sommerville. Software Engineering, Pearson Education (Addison Wesley)
2. Waman S. Jawadekar,"Software Engineering: Principles and Practice", McGrawHill
3. K.K.Agrawal & Yogesh Singh, "Software Engineering", New Age Publication
4. R. S. Pressman, "Software Engineering – A practitioner's approach", McGraw Hill

Suggested Digital PDF :

Note: This Major Course Paper is compulsory for all students of Diploma in Information Technology.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Certificate Course.

Programme/Class: (DIPLOMA IN INFORMATION TECHNOLOGY)	Year: Second	Semester: Fourth
Course Code: BIT-403	Course Title: Operating System	

Course outcomes:

The Student at the completion of the course will be able to:

- Understand key mechanisms in design of operating systems modules.
- Understand process management, concurrent processes and threads, memory management, virtual memory concepts, deadlocks, file system.
- Compare performance of processor scheduling algorithms.

Credits:	Major Core Compulsory
Max. Marks:	Min. Passing marks:

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	Operating System: definition, simple batch system, Time sharing system, Real time system , storage Hierarchy, operating system service, System Calls. Process: Process concept, process Scheduling, operating on process, co-operating process.	15
II	CPU: Scheduling concepts, Scheduling algorithms, process synchronization, critical section problem, synchronization hardware, semaphores, Two Level Scheduling. Deadlocks: deadlock characterization, deadlock prevention, avoidance detection and recovery.	15
III	Memory Management: Swapping, contiguous memory allocation, paging, segmentation, segmentation with paging. Virtual Memory: Demand paging, page replacement, allocation of frames, thrashing.	15
IV	File system: File supports , access methods, allocation methods-contiguous, liked and index allocation, directory system – single level, tree structured, acyclic graph and general graph directory, file protection, File Basis.	15
V	Secondary storage structure: Disk structures, disk scheduling, disk management, allocation methods, free space management, security management, Security, Protection Management.	15

Suggested Readings :

1. Silberschatz G.G., Operating System Concepts, John Wiley & SonsInc.
2. Modern Operating Systems, Andrew S. Tanenbaum,Pearson Prentice Hall,
3. Advanced Concepts in Operating Systems Distributed, Database, and Multiprocessor Operating Systems, Mukesh Singhal and Niranjan G. Shivaratri, Tata McGraw-Hill
4. Operating Systems: A Concept-based Approach,Dhananjay M. Dhamdhere ,Tata McGraw-Hill Education.

Suggested Digital PDF :

Note: This Major Course Paper is compulsory for all students of Diploma in Information Technology.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Certificate Course.

Programme/Class: (DIPLOMA IN INFORMATION TECHNOLOGY)	Year: Second	Semester: Fourth
Course Code: BIT-404	**Course Title: E-Commerce**	

Course outcomes:

The Student at the completion of the course will be able to:

- Understand the basic concepts of E-commerce
- Understand the Electronic Payments, Electronic Data Interchange, EDI Security
- Understand the Security and issues in E-Commerce

Credits:	Major Core Compulsory
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	Introduction: Meaning, Concepts, Features, Functions, Categories of E-Commerce, Scope, Advantages and Limitation of E-Commerce, E-Commerce v/s Traditional Commerce, Types of e-commerce- B2B, B2C, C2C, and P2P, B2B , service provider, e-distributor.	15
II	Electronic Payments: Overview of Electronic Payments, Digital Token Based Electronic Payment System, Smart Cards, and Credit Card/Debit Card based EPS, Emerging Financial Instruments, Home Banking, Online Banking, Cyber Law for E-Commerce.	15
III	Electronic Data Interchange: Benefits of EDI, EDI technology, EDI standards, EDI communications, EDI Implementation, EDI Agreements, EDI Security. Electronic Payment Systems, Need of Electronic Payment System: Study and examine the use of Electronic Payment system and the protocols used	15
IV	Security in E Commerce Threats in Computer Systems: Virus, Cyber Crime Network Security: Encryption, Protecting Web server with a Firewall, Firewall and the Security Policy, Network Firewalls and Application Firewalls, Proxy Server.	15
V	lssues in E Commerce Understanding Ethical, Social and Political issues in E-Commerce: A model for Organizing the issues, Basic Ethical Concepts, Analyzing Ethical Dilemmas, Candidate Ethical principles Privacy and Information Rights: Information collected at E-Commerce Websites, The Concept of Privacy, Legal protections Intellectual Property Rights: Types of Intellectual Property protection, Governance.	15

Suggested Readings :

1. Ravi Kalakota, Andrew Whinston , “frontiers of Electronic Commerce”, Addision Wesley
2. Sokol, “From EDI to Electronic Commerce: A Business Initiative”. TMH
3. Bajaj Nag, “E Commerce : The Cutting Edge of Business”, TMH.
4. Elias. M. Awad, " Electronic Commerce", Prentice-Hall of India Pvt Ltd.

Suggested Digital PDF :

Note: This Major Course Paper is compulsory for all students of Diploma in Information Technology.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Certificate Course.

Programme/Class: (Diploma in Information Technology)	Year: Second	Semester: Fourth
Course Code: BIT 405	Course Title : Java Programming	

Course Outcomes:

The Student at the completion of the lab course will be able to:

- Design, develop, test and debug Java programs using object-oriented principles.
- Develop Applets Programs.

Credits:4	Minor/Elective
Max. Marks: 25+75	Min. Passing marks: 33

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 0-0-4

	Topics	
1.	Write a java program to find the Fibonacci series using recursive and non recursive functions.	
2.	Write a java program to multiply two given matrices.	
3.	Write a program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MulDiv that extends from AddSub class to use the member data of the super class. MulDiv should have methods to multiply and divide A main function should access the methods and perform the mathematical operations.	
4.	Write a java program to create a student class with following attributes: Enrollment_id: Name, Mark of sub1, Mark of sub2, mark of sub3, Total Marks. Total of the three marks must be calculated only when the student passes in all three subjects. The pass mark for each subject is 50. If a candidate fails in any one of the subjects his total mark must be declaredas zero. Using this condition write a constructor for this class. Write separate functions for accepting and displaying student details. In the main method create an array of three student objects and display the details.	
5.	Write a java program for Method overloading, method overriding and Constructor overloading.	
6.	Write a java program to display the employee details using Scanner class.	
7.	Write a java program to represent Abstract class with example.	
8.	Write a java program to implement Interface using extends keyword.	
9.	Write a java program to implement different types of constructor and destructor.	
10.	Write a java program to implement single inheritance.	
11.	Write a java program to implement multiple inheritance.	
12.	Write a java program to implement multilevel inheritance.	
13.	Write a java program to implement hierarchical inheritance.	

14.	Write a java program to create user defined package	
15.	Write a java program for creating multiple catch blocks.	
16.	Write a java program for try catch in exception handling.	
17.	Write a java program for nested try catch in exception handling.	
18.	Write a program to implement applet.	

Suggested Readings:

Note: This Minor Elective (course paper) is compulsory for all students of Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisite: 10+2 with any subject

Programme/Class: (DIPLOMA IN INFORMATION TECHNOLOGY)	Year: Second	Semester: Fourth
Course Code: BIT-406	**Course Title**: **Cloud Computing Tools and Techniques**	

Course outcomes:

The Student at the completion of the course will be able to:

- Understand the basics of cloud computing along with virtualization.
- Basic understanding about cloud and virtualization along with it how one can migrate over it.

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	Cloud Computing, Cloud components, Essential characteristics, On-demand selfservice, Broad network access, Location independent resource pooling ,Rapid elasticity , Measured service, Comparing cloud providers with traditional IT service providers, Roots of cloud computing.	15
II	Cloud Insights Architectural influences – High-performance computing, Utility and Enterprise grid computing, Cloud scenarios – Benefits: scalability ,simplicity ,vendors ,security, Limitations – Sensitive information - Application development- security level of third party - security benefits, Regularity issues: Government policies.	15
III	Cloud Architecture- Layers and Models Layers in cloud architecture, Software as a Service (SaaS), features of SaaS and benefits, Platform as a Service (PaaS), features of PaaS and benefits, Infrastructure as a Service (IaaS), features of IaaS and benefits, Service providers, challenges and risks in cloud adoption. Cloud deployment model: Public clouds – Private clouds – Community clouds - Hybrid clouds - Advantages of Cloud computing.	15
IV	Cloud Simulators- CloudSim and GreenCloud Introduction to Simulator, understanding CloudSim simulator, CloudSim Architecture(User code, CloudSim, GridSim, SimJava) Understanding Working platform for CloudSim, Introduction to GreenCloud	15
V	Introduction to VMWare Simulator Basics of VMWare, advantages of VMware virtualization, using Vmware workstation, creating virtual machines-understanding virtual machines, create a new virtual machine on local host, cloning virtual machines, virtualize a physical machine, starting and stopping a virtual machine.	15

Suggested Readings :

1. Cloud computing a practical approach - Anthony T.Velte , Toby J. Velte Robert Elsenpeter,TATA McGraw- Hill , New Delhi – 2010
2. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate,Online - Michael Miller - Que 2008
3. Cloud computing for dummies- Judith Hurwitz , Robin Bloor , Marcia Kaufman ,Fern Halper, Wiley Publishing, Inc, 2010
4. Cloud Computing (Principles and Paradigms), Edited by Rajkumar Buyya, James Broberg, Andrzej Goscinski, John Wiley & Sons, Inc. 2011

Suggested Digital PDF :

Note: This Major Course Paper is compulsory for all students of Diploma in Information Technology.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Certificate Course.

Co-Curricular:4

Vedic Studies/Vedic Mathematics

(Syllabus as prescribed by University)

Detailed Curriculum

BACHELOR IN INFORMATION TECHNOLOGY

Programme Outcomes (POs):

At the end of the three year BIT programme the students will be able to:

- Understand, analyze and develop computer programs in the areas related to algorithm, web design and networking for efficient design of computer based system.
- Work in the IT sector as system engineer, software tester, junior programmer, web developer, system administrator, software developer etc.
- Apply standard software engineering practices and strategies in software project development using open source programming environment to deliver a quality of product for business success.

Programme Specific Outcomes (PSOs):

- Equip themselves to potentially rich & employable field of computer applications.
- Pursue higher studies in the area of Computer Science/Applications/Information Technology.
- Take up self-employment in Indian & global software market.
- Meet the requirements of the Industrial standards.

COURSE STRUCTURE								
BACHELOR IN INFORMATION TECHNOLOGY								
Year	**Sem**		**Subject**	**Course Code**	**Paper Title**	**Theory/Practical**	**Marks**	**Credit**
Third Year	**V**	**Major**	**I**	BIT-501	Python Programming	Theory	100 (25+75)	4
			II	BIT-502	Cryptography and n/w security	Theory	100 (25+75)	4
			III	BIT-503	Computer Graphics	Theory	100 (25+75)	4
			IV	BIT-504	Machine Learning	Theory	100 (25+75)	4
			v	BIT-505	Python Programming	Practical	100 (25+75)	4
		Minor/Elective	**VI**	BIT-506	Internet of Thing (IoT)	Theory	100 (25+75)	4
		Co-Curricular	**Co-C-5**				100 (25+75)	Qlfy.
		Industrial	**Ind-1**		Project/,Dissertation	Ind.Training	100 (25+75)	Qlfy.-4**
	VI	**Major**	**I**	BIT-601	Theory of Computation	Theory	100 (25+75)	4

			II	BIT-602	Computer Organization & Architecture	Theory	100 (25+75)	4
			III	BIT-603	C#.NET	Theory	100 (25+75)	4
			IV	BIT-604	Data Warehousing & Data mining	Theory	100 (25+75)	4
			V	BIT-605	C#.NET	Practical	100 (25+75)	4
		Minor/Elective	**VI**	BIT-606	Artificial intelligence & application	Theory	100 (25+75)	4
		Co-Curricular	**Co-C-6**					Qlfy.
		Industrial	**Ind-2**		Project/Dissertation	Ind.Training		Olfy-4**
							TOTAL	**52**

Semester Fifth

Programme/Class: (Bachelor in Information Technology)	Year: Third	Semester: fifth
Course Code: BIT-501	**Course Title: Python Programming**	

Course outcomes:

The Student at the completion of the course will be able to:

- Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements..
- Express proficiency in the handling of strings, functions and files.
- Create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets.
- Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python.

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 4-0-1

Unit	Topics	No. of Lectures
I	Python,Features of Python, Writing Python Program, Executing a Python Program Comments in Python, Docstrings,Variables, Datatypes in Python, Built-in datatype, Sequences in Python, Literals in Python, Determining the Datatype of a Variable, User-defined Datatypes, Constants in Python, Identifiers and Reserved words, Naming Conventions in Python.	15
II	Operators in Python Operator, Output statements, Input Statements, Command Line Arguments, Control Statements: if Statement, if … else Statement ,if … elif … else Statement, while Loop, for Loop, Infinite Loops, Nested Loops, else Suite, break Statement, continue Statement, pass Statement, assert Statement, return Statement	15
III	Functions: Defining a Function, Calling a Function, Returning Results from a Function, Returning Multiple Values from a Function, Functions are First Class Objects, Pass by Object Reference, Formal and Actual Arguments, Positional Arguments, Keyword Arguments, Default Arguments, Variable Length Arguments, Local and Global Variables, The Global Keyword, Passing a Group of Elements to a Function, Recursive Functions, Anonymous Functions or Lambdas, Function Decorators, Generators	15
IV	Introduction to Oops: Features of Object Oriented Programming System (OOPS), Classes and Objects, Constructors, Inheritance and Polymorphism, Operator Overloading, Method Overloading, Method Overriding,abstract class and interface.	15
V	Errors in a Python Program, Exceptions, Exception Handling, Types of Exceptions, Except clause,try-finally clause, raising an exception, assert Statement, User-Defined Exceptions. Files in Python: Files, Types of Files in Python, Opening a File, Closing a File, Working with Text Files Containing Strings, Knowing Whether a File Exists or Not, Working with Binary Files, with Statement, seek() and tell() Method.	15

Suggested Readings:

1. Learning To Program With Python by Richard L. Halterman
2. Learning Python by Mark Lutz

Suggested Digital PDF:

Note: This Major Course Paper is compulsory for all students of Bachelor in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Diploma Course.

Programme/Class: (Bachelor in Information Technology)	Year: Third	Semester: fifth
Course Code: BIT-502	**Course Title: : Cryptography and Network Security**	

Course outcomes:

The Student at the completion of the course will be able to:

- Analyze and design classical encryption techniques and block ciphers, DES,AES.
- Understand and analyze public-key cryptography, RSA and other public-key cryptosystems such as RSA, Diffie-Hellman Key Exchange, ElGamal Cryptosystem, etc.
- Analyze and design hash and MAC algorithms, and digital signatures.
- Understand the network application security schemes, such as PGP, S/ MIME, IPSec, SSL, TLS, HTTPS, SSH, etc. Know about Intruders and Types of Malicious software ,Firewall Characteristics, Types of Firewalls

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	**INTRODUCTION :** Internet Security, Goals, Model of network security ,Security attacks, services and mechanisms, Classical encryption techniques: substitution techniques(Mono-alphabetic Cipher and Poly-alphabetic Cipher), transposition techniques, cryptanalyst.	15
II	**SYMMETRIC KEY CRYPTOGRAPHY :** MATHEMATICS OF SYMMETRIC KEY CRYPTOGRAPHY: Algebraic structures – Modular arithmetic-Euclid's algorithm-Congruence and matrices – Groups, Rings, Fields- Finite fields SYMMETRIC KEY CIPHERS: SDES – Block cipher Principles of DES – Strength of DES – Differential and linear cryptanalysis – Block cipher design principles – Block cipher mode of operation – Evaluation criteria for AES – Advanced Encryption Standard – RC4 – Key distribution.	15
III	**PUBLIC KEY CRYPTOGRAPHY :**MATHEMATICS OF ASYMMETRIC KEY CRYPTOGRAPHY: Primes – Primality Testing , Factorization, Euler's totient function, Fermat's and Euler's Theorem ,Chinese Remainder Theorem – Exponentiation and logarithm ASYMMETRIC KEY CIPHERS: RSA cryptosystem ,Deffie Hellman Key distribution, Key management , ElGamal cryptosystem ,Elliptic curve cryptography.	15
IV	**MESSAGE AUTHENTICATION AND INTEGRITY** Authentication requirement ,Authentication function , MAC ,Hash function , HMAC, SHA, WHIRLPOOL, Digital signature ,DSS- Entity Authentication: Biometrics, Passwords, Challenge Response protocols, Kerberos, X.509	15
V	**SECURITY PRACTICE AND SYSTEM SECURITY :** Electronic Mail security ,PGP, S/MIME ,IP security, Web Security ,SYSTEM SECURITY: Intruders, Malicious software, viruses, Firewalls.	15

Suggested Readings:

1. William Stallings, Cryptography and Network Security: Principles and Practice, PHI 3rd Edition, 2006.
2. C K Shyamala, N Harini and Dr. T R Padmanabhan: Cryptography and Network Security, Wiley India Pvt.Ltd
3. Behrouz A.Foruzan, Cryptography and Network Security, Tata McGraw Hill 2007.
4. Charlie Kaufman, Radia Perlman, and Mike Speciner, Network Security: PRIVATE Communication in a PUBLIC World, Prentice Hall, ISBN 0-13-046019-2

Suggested Digital PDF:

Note: This Major Course Paper is compulsory for all students of Bachelor in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Diploma Course.

Programme/Class: (Bachelor in Information Technology)	Year: Third	Semester: fifth
Course Code: BIT-503	**Course Title: Computer Graphics**	

Course outcomes:

The Student at the completion of the course will be able to:

- Understand the structure and components of an interactive computer graphics system.
- Understand line drawing and circle drawing algorithm, line clipping algorithm and polygon clipping algorithms.
- Understand geometrical transformations and its operations, Colour Model and its conversion

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	**Introduction of Computer Graphics :** Computer Graphics and its application, components, computer graphics hardware and software, Display Devices and types, Architecture of Raster and Random scan display devices, plasma panel display, LCD , LED.	15
II	**Introduction of Point Plotting Technique & Coordinate System :** DDA Line Drawing Algorithm, Bresenham's line drawing algorithm, Circle Generation Algorithm : Midpoint Circle Generation Algorithm, Bresenham's Algorithm for Circle Generation.	15
III	**Introduction of Transformation and Transformation Principles :** Two Dimensional Transformation, Translation, Scaling, Shearing, reflection and Rotation, Composite transformation, Instant transformation and concatenation of matrices, Homogeneous coordinate and matrices.	15
IV	**Intro of Clipping and Windowing and Viewing Transformation:** Viewing coordinate references frame and window–to-viewport, mapping, Point clipping and Line clipping, Cohen Sutherland algorithm, Midpoint subdivision algorithm, Sutherland-Hodgeman polygon clipping algorithm	15
V	**Color Model :** CIE Chromaticity digram, color models (XYZ,RGB,CMY,CMYK,HSV,YIQ,HLS,HIS), Conversions between color models.	15

Suggested Readings:

1. Computer Graphics , Hearn & Baker, PHI

Suggested Digital PDF:

Note: This Major Course Paper is compulsory for all students of Bachelor in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Diploma Course.

Programme/Class: (Bachelor in Information Technology)	Year: Third	Semester: Fifth
Course Code: BIT-504	**Course Title: Machine Learning**	

Course outcomes:

The Student at the completion of the course will be able to:

- Understand the features of machine learning to apply on real world problems
- Characterize the machine learning algorithms as supervised learning and unsupervised learning
- Analyze the concept of neural networks for learning linear and non-linear activation functions
- Understand the fundamental concepts of natural processing, deep learning and neural network

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	Introduction: Overview of machine learning, Flavors of Machine Learning: Unsupervised, Supervised, Reinforcement, Hybrid models. Decision Boundaries: crisp, and non-crisp, optimization problems. Examples of unsupervised learning	15
II	Unsupervised Learning: Simple regression, Multiple Linear Regression, Polynomial Regression, Support Vector Regression (SVR), Decision Tree Regression, Random forest Regression, Evaluation regression models performance	15
III	Classifications: Logistic regression, K-Nearest Neighbors, Support Vector machine, Kernel SVM, Naïve Bayes, Decision tree Classification, Random Forest Classification	15
IV	Clustering: K-Means Clustering, Hierarchical Clustering, Association rule learning , Apriori, Reinforcement Learning	15
V	Advanced Machine Learning : Reinforcement learning, Natural language Processing, Deep Learning, Artificial Neural Networks, Convolutional Neural Networks, Dimensionality reduction, Principal Component Analysis (PCA), Linear Discriminant Analysis (LDA), Kernel PCA	15

Suggested Readings:

1.Machine Learning, T. Mitchell, McGraw-Hill, 1997.

2. Machine Learning in action ,Peter Harrington Wiley

3. Pattern Classification, R. Duda, E. Hart, and D. Stork, Wiley-Interscience, 2000.

4.Machine Learning, E. Alpaydin, MIT Press, 2010. 7. Machine Learning: A Probabilistic Perspective, K. Murphy, 5.MIT Press, 2012.

Suggested Digital PDF:

Note: This Major Course Paper is compulsory for all students of Bachelor in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Diploma Course.

Programme/Class: (Bachelor in Information Technology)	Year: Third	Semester: Fifth
Course Code: BIT-505	Course Title : Python Programming	

Course Outcomes:

The Student at the completion of the lab course will be able to:

- Write, Test and Debug Python Programs.
- Create Conditionals and Loops for Python Programs.
- Use functions and represent Compound data using Lists, Tuples and Dictionaries.
- Read and write data from & to files in Python.

Credits:4	Minor/Elective
Max. Marks: 25+75	Min. Passing marks: 33

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 0-0-4

	Topics	
1.	Write a program in python to check if a number belongs to the Fibonacci Sequence.	
2.	Write a program in python to solve Quadratic Equations .	
3.	Write a program in python to implement a sequential search.	
4.	Write a program in python to find the sum of n natural numbers.	
5.	Write a program in python to display Multiplication Tables.	
6.	Write a program in python to check if a given number is a Prime Number or not.	
7.	Write a program in python to create a calculator program.	
8.	Write a program in python to demonstrate string functions.	
9.	Write a program in python to demonstrate use of List.	
10.	Write a program in python to demonstrate use of Dictionaries.	
11.	Write a program in python to demonstrate Lambda Function.	
12.	Write a program in python to demonstrate Generators.	
13.	Write a program in python to demonstrate Decorators.	
14.	Write a program in python to demonstrate class and object.	
15.	Write a program in python in python to demonstrate overloading and overriding.	
16.	Write a program in python to demonstrate Inheritance and its type.	
17.	Write a program in python to demonstrate Constructor.	
18.	Write a program in python to demonstrate Exceptions handling in Python.	

19.	Write a program in python to Drawing Line chart and Bar chart using Matplotlib.	
20.	Write a program in python demonstrate file handling.	

Suggested Readings:

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Note: This Minor Elective (course paper) is compulsory for all students of Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisite: 10+2 with any subject

Programme/Class: (Bachelor in Information Technology)	Year: Third	Semester: fifth
Course Code: BIT-506	**Course Title: Internet of Thing (IoT)**	

Course outcomes:

The Student at the completion of the course will be able to:

- Understand building blocks of Internet of Things and characteristics.
- Understand the IOT protocols, application and web of things.

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	Introduction: IOT - What is the IoT and why is it important? Elements of an IoT ecosystem, Technology drivers, Business drivers, Trends and implications, Overview of Governance, Privacy and Security Issues. Unit 4:	15
II	IOT PROTOCOLS - Protocol Standardization for IoT – Efforts – M2M and WSN Protocols – SCADA and RFIDProtocols – Issues with IoT Standardization – Unified Data Standards – Protocols – IEEE802.15.4–BACNet Protocol– Modbus – KNX – Zigbee– Network layer – APS layer – Security	15
III	IOT ARCHITECTURE - IoT Open source architecture (OIC)- OIC Architecture & Design principles- IoT Devices and deployment models- IoTivity : An Open source IoT stack - Overview- IoTivity stack architecture- Resource model and Abstraction	15
IV	WEB OF THINGS - Web of Things versus Internet of Things – Two Pillars of the Web – Architecture StandardizationforWoT– Platform Middleware for WoT – Unified Multitier WoT Architecture – WoT Portals andBusiness Intelligence.	15
V	IOT APPLICATIONS - IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications. Study of existing IoT platforms /middleware, IoT-A, Hydra.	15

Suggested Readings:

1. Honbo Zhou, “The Internet of Things in the Cloud: A Middleware Perspective”, CRC Press,2012.
2. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), “Architecting the Internet ofThings”, Springer, 2011.
3. David Easley and Jon Kleinberg, “Networks, Crowds, and Markets: Reasoning About a HighlyConnected World”, Cambridge University Press, 2010.
4. Olivier Hersent, David Boswarthick, Omar Elloumi , “The Internet of Things – Key applicationsand Protocols”, Wiley, 2012.

Suggested Digital PDF:

Note: This Major Course Paper is compulsory for all students of Bachelor in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Diploma Course.

Co-Curricular: 5

Meditation/Personality Development through Applied Philosophy of Ramcharitra Manas

(Syllabus as prescribed by University)

Sixth Semester

Programme/Class: (Bachelor in Information Technology)	**Year: Third**	**Semester: Sixth**
Course Code: BIT-601	**Course Title: Theory of Computation**	

Course outcomes:

The Student at the completion of the course will be able to:

- Understand the concept of Finite Automata and Regular Expression
- Illustrate the design of Context Free Grammar for any language set
- Demonstrate the push down automaton model for the given language
- Make use of Turing machine concept to solve the simple problems
- Explain decidability or undecidability of various problems

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	**Automata:** Introduction to formal proof, Additional forms of proof , Inductive proofs ,Finite Automata (FA) ,Deterministic Finite Automata (DFA),Non-deterministic Finite Automata (NFA),Finite Automata with Epsilon transitions.	15
II	**Regular Expression and Languages :** Regular Expression ,FA and Regular Expressions , Proving languages not to be regular, Closure properties of regular languages , Equivalence and minimization of Automata.	15
III	**Context-free Grammars and Languages :** Context-Free Grammar (CFG),Parse Trees, Ambiguity in grammars and languages, Definition of the Pushdown automata, Languages of a Pushdown Automata, Equivalence of Pushdown automata and CFG ,Deterministic Pushdown Automata.	15
IV	**Properties of Context-free Languages:** Normal forms for CFG,Pumping Lemma for CFL,Closure Properties of CFL, Turing Machines, Programming Techniques for TM.	15
V	**Undecidabality:** A language that is not Recursively Enumerable (RE),An undecidable problem that is RE, Undecidable problems about Turing Machine, Post's Correspondence Problem, The classes P and NP.	15

Suggested Readings:

1. J.E. Hopcroft, R. Motwani and J.D. Ullman, "Introduction to Automata Theory,Languages and Computations
2. H.R. Lewis and C.H. Papadimitriou, "Elements of the theory of Computation", Second Edition, Pearson Education,
3. Thomas A. Sudkamp," An Introduction to the Theory of Computer Science, Languages and Machines", Third Edition, Pearson Education,

Suggested Digital PDF:

Note: This Major Course Paper is compulsory for all students of Bachelor in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Diploma Course.

Programme/Class: (Bachelor in Information Technology)	Year: Third	Semester: Sixth
Course Code: BIT-602	**Course Title: Computer Organization & Architecture**	

Course outcomes:

The Student at the completion of the course will be able to:

- Understand about concepts of Computer Organization and design.
- Understand and implement Instruction codes and op-codes, Registers, Computer Instructions, timing and control.
- Understand CPU basics, Stack Organization, Instruction format, Addressing formats, Memory organization and pipelining.

Credits:	Major Core Compulsory
Max. Marks:	Min. Passing marks:

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	**Basic Computer Organization and Design:** Register Transfer Language, Arithmetic and Logical micro-operations, Shift micro-operation. Computer registers, bus system, instruction set, timing and control, instruction cycle, memory reference instructions, input-output and interrupt. Design of basic computer, Booth algorithm.	15
II	**Central Processing Unit:** Micro programmed control, Control memory, address sequencing, General Register organization, stack organization, Instruction formats, addressing modes, Data transfer and manipulation, Program Control, RISC, CISC.	15
III	**Input-Output Organization:** Peripheral devices, I/O interface, Asynchronous data transfer, Strobe Control, Handshaking Modes of Transfer, Priority Interrupt, Direct Memory Access, Input-Output Processor, and Serial Communication.	15
IV	**Memory Organization:** Memory Hierarchy, Main memory (RAM/ROM chips), Auxiliary memory, Associative memory, Cache memory, Virtual Memory.	15
V	**Pipelining:** Parallel processing, Amdahl's law, Pipelining, Flynn's classification, space-time diagram, speedup ratio, Arithmetic pipeline, Instruction pipeline.	15

Suggested Readings:

1. M. Mano, Computer System Architecture, Pearson Education 1992
2. W. Stallings, Computer Organization and Architecture Designing for Performance, 8th Edition, Prentice Hall of India,2009
3, M.M. Mano, Digital Design, Pearson Education Asia,2013 5. Carl Hamacher, Computer Organization, Fifth edition, McGraw-Hill, 2012.

Suggested Digital PDF:

Note: This Major Course Paper is compulsory for all students of Bachelor in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Diploma Course.

Programme/Class: (Bachelor in Information Technology)	Year: Third	Semester: Sixth
Course Code: BIT-603	**Course Title: C#.NET**	

Course outcomes:

The Student at the completion of the course will be able to:

- Use the features of Dot Net Framework along with the features of C#.

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 4-0-1

Unit	Topics	No. of Lectures
I	Introduction to C# Programming, What is C#? ,Does C# Replace Java? ,Simple Program:Printing a Line of Text ,Memory Concepts ,Variables and Data types ,Initialization of Variables ,Variable Scope , Constants ,Value Types and Reference Types ,CTS Types	15
II	Operators,control statements, Arrays and Strings,Exception Handling Exception Classes, Standard Exceptions ,User Defined Exceptions, Delegates	15
III	Object Oriented Programming · Objects and Classes · Methods and Properties · Constructors and Destructors Inheritance Types of Inheritance· Structs and Classes · Abstract Classes ·Implementing Polymorphism by Method Overloading · Implementing Polymorphism by Method Overriding	15
IV	Interfaces and Structures Interfaces · Defining and Implementing Interfaces · DerivedInterfaces · Accessing Interfaces · Overriding Interfaces Structures · Defining Structs · Creating structs · Creating Enum	15
V	An Overview of C#.Net Building Windows Based Applications · Standard Controls ·Components · Forms · Menus and Dialogues ·Validating user input Accessing Data withADO.NET, Crystal Reports · Overview of ADO.NET · Accessing Data · Using Dataset Objects and Updating Data · Binding, Viewing, and Filtering Data · Connecting With the Database	15

Suggested Readings:

1. Beginning ASP.NET 3.5: In C# and VB, WROX publication
2. C# 2008 Programming Black Book by Kogent Solutions Inc (Author)

Suggested Digital PDF:

Note: This Major Course Paper is compulsory for all students of Bachelor in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Diploma Course.

Programme/Class: (Bachelor in Information Technology)	Year: Third	Semester: Sixth
Course Code: BIT-604	**Course Title: Data Warehousing and Data Mining**	

Course outcomes:

The Student at the completion of the course will be able to:

- Understand the Data Warehouses, OLAP and data processing.
- Understand the concept of classification, different classification algorithms and their applications.
- Understand the data mining concept, application and their usage.
- Understand the concept of clustering and different cluster analysis methods.

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	Data Mining:- Concepts and Applications, Data Mining Stages, Data Mining Models, Data Warehousing (DWH) and On-Line Analytical Processing (OLAP), Need for Data Warehousing, Challenges, Application of Data Mining Principles, OLTP Vs DWH, Applications of DWH	15
II	Data Preprocessing: Data Preprocessing Concepts, Data Cleaning, Data integration and transformation, Data Reduction, Discretization and concept hierarchy	15
III	Classification Models: Introduction to Classification and Prediction, Issues regarding classification and prediction, Decision Tree- ID3, C4.5, Naive Bayes Classifier.	15
IV	Rule based classification-Neural Networks-Back propagation. Support Vector Machines, Lazy Learners-K Nearest Neighbor Classifier. Accuracy and error Measures evaluation. Prediction:-Linear Regression and Non-Linear Regression	15
V	Cluster Analysis: Introduction, Concepts, Types of data in cluster analysis, Categorization of clustering methods. Partitioning method: K-Means and K-Medoid Clustering.	15

Suggested Readings:

1. Alex Berson And Stephen J.Smith, "Data Warehousing, Data Mining And OLAP",Tata McGraw – Hill Edition, Thirteenth Reprint 2008.
2. Jiawei Han And Micheline Kamber, "Data Mining Concepts And Techniques", Third Edition, Elsevier, 2012.

Suggested Digital PDF:

Note: This Major Course Paper is compulsory for all students of Bachelor in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Diploma Course.

Programme/Class: (Certificate in Information Technology)	Year: Third	Semester: Sixth
Course Code: BIT-605	**Course Title :** C#.NET	

Course Outcomes:

The Student at the completion of the lab course will be able to:

- Write, compile and debug programs and implements the concept of object oriented programming in C# language.
- To get knowledge of windows programming and server side programming.
- To gain knowledge on web services and dynamic link libraries.

Credits:4	Minor/Elective
Max. Marks: 25+75	Min. Passing marks: 33

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 0-0-4

	Topics	
1.	Write a C# programs to demonstrate the concepts of Structures.	
2.	Write a C# programs to demonstrate the concepts of Enumerations.	
3.	Write a C# programs to demonstrate the concepts of Constructors.	
4.	Write a C# programs to demonstrate the concepts of Inheritance.	
5.	Write a C# programs to demonstrate the concepts of Polymorphism	
6.	Write a C# programs to demonstrate the concepts of Delegates.	
7.	Write a C# programs to demonstrate the concepts of Label, Text Box and Button controls.	
8.	Write a C# programs to demonstrate the concepts of Combo Box and List Box controls.	
9.	Create a Windows application in C# for registration form and fill the details and when you click the submit button it display the details in the message box.	
10.	Create a Windows application in C# having two text boxes and three buttons named as factorial, prime, factorial series. When you click any button the resultant value will be displayed on the second textbox.	
11.	Create a ADO.NET application in C# to verify if the connection is established with OLEDB and MS-ACCESS.	
12.	Create a ADO.NET application in C#, to create a table and insert values into created table.	
13.	Create an ADO.NET application in C#, to retrieve the values from the table using DataReader object.	
14.	Create an ADO.NET application in C#, to demonstrate DataAdapter object	
15.	Create an ADO.NET application in C#, to demonstrate dataGridView Control.	

16.	Develop the Static Webpages using HTML and some validations along with Java Script.	
17.	Design an ASP.NET Webpage to work with Dropdown list and ListBox controls	
18.	Develop a Registration Form with all Validation Controls.	
Suggested Readings:		
Note: This Minor Elective (course paper) is compulsory for all students of Information Technology Course.		
Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/test with MCQs/short & long questions, attendance and participation in the class.		
Course pre requisite: 10+2 with any subject		

Programme/Class: (Bachelor in Information Technology)	Year: Third	Semester: Sixth
Course Code: BIT-606	**Course Title: Artificial Intellegence & Applications**	

Course outcomes:

The Student at the completion of the course will be able to:

- Understand the theory of Artificial intelligence and problem solving and searching techniques.
- Understand the concept of Knowledge representation, learning, Expert System And Machine Vision

Credits:	**Major Core Compulsory**
Max. Marks:	**Min. Passing marks:**

Total No. of lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0

Unit	Topics	No. of Lectures
I	**Introduction** Introduction to Artificial Intelligence, Background and Applications, Turing Test and Rational Agent approaches to AI, Introduction to Intelligent Agents, their structure, behavior and environment.	15
II	**Problem Solving and Searching Techniques** Problem Characteristics, Production Systems, Control Strategies, Breadth First Search, Depth First Search, Hill climbing and its Variations, Heuristics Search Techniques: Best First Search, A* algorithm, Constraint Satisfaction Problem, Means-End Analysis, Introduction to Game Playing, Min-Max and Alpha-Beta pruning algorithms.	15
III	**Knowledge Representation** Definition and importance of Knowledge, Issues in Knowledge Representation, Knowledge Representation Systems, Properties of Knowledge Representation Systems, Types of Knowledge, The Role of Knowledge: Knowledge representation techniques: Rule Based, Semantic Nets, Frames, Logic based	15
IV	**Learning** Rote learning, learning by analogy, inductive learning, Explanation based learning, Supervised and unsupervised learning, learning by evolution (genetic algorithm)	15
V	**Expert System And Machine Vision** Expert System, Architecture of an expert system, Stages of expert systems development. Concept of Machine Vision. Steps of machine vision, application of machine.	15

Suggested Readings:

1. DAN.W. Patterson, Introduction to A.I and Expert Systems – PHI, 2007.
2. Russell & Norvig, Artificial Intelligence-A Modern Approach, LPE, Pearson Prentice Hall, 2nd edition, 2005.
3. Rich & Knight, Artificial Intelligence – Tata McGraw Hill, 2nd edition, 1991.

Suggested Digital PDF:

Note: This Major Course Paper is compulsory for all students of Bachelor in Information Technology Course.

Suggested Continuous Evaluation Method: Seminar/ Presentation on any topic related to syllabus, Examination/Practical/ Internal/External Test with MCQs/short & long questions, attendance and participation in the class.

Course pre requisites: Student must have qualified Diploma Course.

Co-Curricular: 6

Indian Traditional Knowledge System/Vivekananda Studies

(Syllabus as prescribed by University)