SYLLABUS FOR THE BATCH FROM THE YEAR 2023 TO YEAR 2026

Programme Code: BIT

Programme Name: B.Sc. (Information Technology)

(Semester I-VI)

Examinations: 2023-2026

P.G. Department of Computer Science & Applications

Khalsa College, Amritsar

Programme name: B.Sc. (Information Technology)
Programme code: BIT
Programme Duration : 3 years /4 years (as per NEP 2020)

Prgramme Objectives:

1.	To synergize Information Technology in its entire ramification.
2.	To provide basic inputs in various aspects of and a broad understanding of IT and its other interdisciplinary interfaces.
3.	Focus of the program is Information Technology and Management of Information Technology.
4.	To cater to the needs of effectively managing the business by bridging the gap between managerial practices in vogue and Information Technology.
5.	To think analytically, creatively and critically in developing robust, extensible and highly maintainable technological solutions to simple and complex
6.	To apply their knowledge and skills to be employed and excel in IT professional careers and/or to continue their education in IT and/or related post graduate programmes.

Program Specific Outcomes (PSOs):

PSO-1.	To widen the understanding of computing technologies and covers high level concept that enable the effective management and planning of IT project and services.
PSO-2.	To gain understanding about techniques, technologies and methods used in managing and implementing information technology systems.
PSO-3.	To gain technical specializations, management and planning of IT project and services.
PSO-4.	To develop and analyze quality computer applications by applying knowledge of software engineering, algorithms, programming, databases and networking.
PSO-5.	To identify and utilize the state-of-the-art tools and techniques in the design and development of software products and solutions.
PSO-6.	To gain practical experience in shipping real world software, using recent industry standard tools and collaboration techniques will equip to secure and succeed in IT industry.
PSO-7.	To develop an ability to communicate effectively with a range of audiences, develop written and oral presentations of information technology solutions appropriate for a wide range of audiences.

B.Sc. (Information Technology)
Semester-I

SN	Course Code	Course Name	Distribution of The Marks				Lectures Per week			Credit Distribution			Total Credit L+T+P	Page No.
			Theory	Internal Assessment	Practical	Total	L	T	P	L	T	P		
Discipline Specific Course(DSC)														
1	BIT-111 (Major)	Fundamentals of Computers	75	25	-	100	5	1	0	3	1	0	4	4-5
2	BIT-112 (Major)	Introduction to Programming-C	75	25	-	100	5	1	0	3	1	0	4	6-7
3	BIT-113 (Major)	Applied & Discrete Mathematics	75	25	-	100	5	1	0	3	1	0	4	8-9
Ability Enhancement Course (AEC)														
4	BCSE-1122	Communication Skills in English	60	25	15	100	4	0	2	3	0	1	4	10-11
5	BPBI-1101/ BPBI-1102/ BPHC-1104	Punjabi/ Basic Punjabi (Mudhli Punjabi) (Compulsory)/ Punjab History & Culture	75	25	-	100	6	0	0	4	0	0	4	12 13 14-15
Skill Enhancement Course(SEC)														
6	BIT-114P	Lab-I: PC Computing	-	25	75	100	0	0	6	0	0	4	4	16-17
7	BIT-115P	Lab-II: C - Language	-	25	75	100	0	0	6	0	0	4	4	18-19
Value Added Course (VAC)														
8	BDA111	*Drug Abuse: Problem, Management and Prevention(Compulsory paper)	-	-	-	50	3	0	0	2	0	0	2	20-21
										Total Credits=30				

Note: *This paper marks will not be included in the total marks.

B.Sc. (Information Technology) Semester – I
BIT-111: Fundamentals of Computers
Discipline Specific Course (DSC)

Time: 3 Hours

Credits		
L	**T**	**P**
3	**1**	**0**

Max. Marks: 100
Theory Marks: 75
Theory Internal Assessment Marks: 25

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 marks each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The students are required to attempt one question from each of these sections.**

Course Objectives:

1.	Teach the fundamentals so students can efficiently use MS Word
2.	Provide a knowledge base for Computer Fundamentals & MS Word upon which you can build.
3.	On such computer literacy that prepares students for life-long learning of computer concepts and skills, Students It focuses discovers why computers are essential components in education, business and society in this course.
4.	Use real-world examples and procedures that will prepare you to be a skilled user of Computer & MS Word, MS Power Point & MS Excel.

UNIT-I

1. Introduction to Computer:
Computer System Characteristics, Hardware - CPU, Memory, Input, Output & Storage devices, Organization of Secondary Storage Media, Software - System & Application, Types of processing: Batch and On-line.

UNIT -II

2. MS Word 2010:

Overview, creating, saving, opening, importing, exporting and inserting files, formatting pages, paragraphs and sections, indents and outdents, creating lists and numbering. Headings, styles, fonts and font size. Editing, positioning and viewing texts, Finding and replacing text, inserting page breaks, page numbers, book marks, symbols and dates. Using tabs and tables, header, footer and printing. Headers and Footers, Mail merge, macros, tables.

UNIT-III

3. MS – Excel 2010:

Create, open and view a workbook, Save and Print Workbooks, Enter and Edit data, Modify a worksheet and a Workbook, Work with a Cell References, Learn to use functions and formulas, Create and Edit charts and graphics, Filter and Sort Table Data, Work with Pivot Tables and Charts, Import and Export Data.

UNIT -IV

4. MS – PowerPoint 2010:

Introduction to MS Power Point, Power Point Elements, Exploring Power Point Menu, Working with Dialog Boxes, Saving Presentation, Printing Slides, Slide View, Slide Sorter view, notes view, outline view, Formatting and enhancing text formatting.

References:

1. R.K. Taxali : Introduction to Software Packages, Galgotia Publicaions.
2. MS–Office, Compiled by SYBIX.
3. MS–Office, BPB Publications (22 April 2018)
4. Introduction to Computer, P.K. Sinha.

Course Outcomes:

At the end of this course student will be able to:

CO-1.	Describe the usage of computers and why computers are essential components in business and society.
CO-2.	Solve common problems using appropriate Computer Fundamentals.
CO-3.	Identify categories of programs, system software and applications. Organize and work with files and folders.
CO-4.	Describe the important computer system resources and the role of operating system in their management policies and algorithms.
CO-5.	Learn basic word processing, spread sheet and presentation graphics software skills.

B.Sc. (Information Technology) Semester – I
BIT-112: Introduction to Programming – C
Discipline Specific Course (DSC)

Time: 3 Hours   **Max. Marks: 100**
                                                                                          Theory Marks: 75
                                                          Theory Internal Assessment Marks: 25

Credits		
L	T	P
3	1	0

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 mark each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The students are required to attempt one question from each of these sections.**

Course Objectives:

1.	The course is designed to provide complete knowledge of C language..
2.	The course enhances the capability of designing the programs using array, functions and pointers.
3.	To build small size applications.

UNIT –I

Introduction to C: Evolution and characteristics of C, Program development tools (Flowcharts, Algorithms), Structure of C Program, Different Errors in C program.
C-Fundamentals: Character set, Various Tokens, Data types, Data input and output statements.
Operators: Different operators in C and Hierarchy of Operators (Precedence and Associativity.
Control Statements: Decision making statements, Iterative/Looping statements, Transfer Statements.

UNIT -II

Program Structure Storage Class: Automatic, external and static variables, multiple programs, more about library functions.
Functions: Brief overview, defining, accessing functions, Library and User Defining Function , passing arguments to function, Recursion.

UNIT -III

Arrays and String: Defining, processing an array, passing arrays to a function, multi–dimensional arrays. String Declaration , Library String Handling Function.
Structure and Union : Defining Structure and Union Variables, Self Referential Structure   , Comparison of Structure with Union.

Pointers: Understanding Pointers, pointer declaration and Initialization, operation on pointers, passing pointer to a function, pointer and one-dimensional arrays.
File Handling: Opening and closing of files, different modes (Reading and writing).

References:
1. Let Us C By Yashwant Kanetkar, BPB Publication,14th Edition,2017.
2. The Complete Reference by Herbert Schildt, indian edition 4th edition ,2017
3. Shcaum Outline Series: "Programming with C",4th edition,2018

Course Outcomes:

At the end of this course student will be able to:

CO-1	Use the fundamentals of C programming in trivial problem solving.
CO-2	Enhance skill on problem solving by constructing algorithms.
CO-3	Identify solution to a problem and apply control structures and use defined functions for solving the problem.

B.Sc. (Information Technology) Semester – I
BIT-113: Applied & Discrete Mathematics
Discipline Specific Course (DSC)

Time: 3 Hours

Max. Marks: 100
Theory Marks: 75
Theory Internal Assessment Marks: 25

Credits		
L	**T**	**P**
3	**1**	**0**

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 mark each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The students are required to attempt one question from each of these sections.**

Course Objectives:

1.	To understand sets and perform different operations on sets.
2.	To Identify functions and their properties.
3.	To enable the students how to think logically and mathematically.
4.	To have knowledge about mathematical concepts that are implemented in computer programming.
5.	To strengthen the ability of students to solve problems related to symbolic logic, matrix operations and Boolean algebra.

UNIT-I

Sets and Relations: Definition of sets, Types, Subsets, Superset, Power set, complement of a set, universal set, intersection and union of sets, Difference of sets, De-Morgan's laws, Cartesian products, Equivalent sets, Partitions of sets, Relations: Basic definitions, Domain and Range, Types of Relations, graphs of relations, properties of relations.

Logic and Propositional Calculus: Proposition and Compound Propositions, basic Logical Operations, Propositions and Truth Tables, Tautologies and Contradictions, Logical Equivalence, Duality law, Algebra of propositions, Conditional and Bi conditional Statements, Arguments, Logical Implication, Propositional Functions, Predicates and Quantifiers, Negation of Quantified Statements, Inference theory of the predicates calculus.

UNIT -II

Boolean Algebra: Introduction to Boolean algebra, Boolean algebra laws, Properties of Boolean algebra, Duality, Boolean Algebra as Lattices, Boolean identities, sub-algebra, Sum-

of-Products Form for Sets, Sum of-Products Form for Boolean Algebra, Normal Forms, Minimal Boolean Expressions, Prime Implicants, Boolean Functions, Karnaugh Maps.

UNIT-III
Matrices: Introduction of a Matrix, its different kinds, matrix addition and scalar multiplication, multiplication of matrices, transpose etc., Square matrices, inverse and rank of a square matrix, Solution of Linear equations using matrices, Matrix Inversion method.

UNIT -IV
Graph Theory Introduction, Types of graph, Simple and Multiple Graphs, Directed and Undirected Graphs, Planer and Non-Planer Graphs, Eulerian and Hamiltonian Graph, Degree of vertex, Sub graphs, Isomorphic and Homeomorphic Graphs, Warshall's algorithm,Dijkstra's Shortest path algorithm, chromatic number, Bipartite Graph, Graph coloring, path, circuit, Adjacent and incidence matrices.

References:
1. Discrete Mathematics (Schaum's Outlines) by Seymour Lipschutz, Marc Laras Lipson,3rd Edition, McGraw Hill Education,2017
2. Discrete Mathematical structures for Computer Sciences, Varsha H. Patil, Revised 3rd Edition Paperback – 1 July 2017, PHI.
3. Applied Discrete Structures for Computer Science by Alan Doerr, March 1991, Galgotia Publications Pvt Ltd.
4. Discrete Mathematical Structures with Applications to Computer Science, by Jean-Paul Tremblay, R Manohar,2017, McGraw Hill Education.
5. Essential Discrete Mathematics for Computer Science by Harry Lewis, Rachel Zax, Princeton University Press,2019.

Course Outcomes:

CO-1.	This course helps to simplify and evaluate basic logic statements using compound statements, implications, inverses, converses, and contra positives using truth tables and the properties of logic.
CO-2.	Develop ability of conversion of logic sentence in terms of predicates, quantifiers, and logical connectives.
CO-3.	Students learn to use various matrix operations such as matrix addition, multiplication, transpose, inverse and calculating rank of matrix.
CO-4.	Students become able to apply the operations of sets, relations and use Venn diagrams to solve real life mathematical.
CO-5.	Students get in-depth knowledge of graph theory from the point of view of problem solving strategy used in game design and assignment problems.
CO-6.	Evaluate the Boolean functions and simplify the expressions using properties of Boolean algebra.

B.Sc. (Information Technology) Semester – I
COMMUNICATION SKILLS IN ENGLISH
Code: BCSE-1122

Time: 3 Hours
Max. Marks: 100
Theory: 60
Practical: 15
Internal Assessment: 25

L	T	P	Credits
3	0	1	4

Suggested Pattern of Question Paper:

The question paper will be divided into two sections. Section A will consist of twelve (12) questions of one (1) mark each. Section B will consist of Six questions of eight (8) marks each. There will be internal choice wherever possible.

Section A
1. Do as directed
   Articles, Conjunctions and Prepositions

(12X1=12 Marks)

Section B

1. Reading Skills: Reading Tactics and strategies; Reading purposes–kinds of purposes; Reading for direct meanings.
2. Comprehension questions of an unseen passage
3. Personal letter and Official/Business letters
4. Writing notices/agenda/minutes for public circulation on topics of professional interest.
5. Writing resume or converting a biographical note into resume
6. Translation from English to Vernacular (Punjabi/ Hindi) (Isolated Sentences)

(6X8=48 Marks)

Course Objectives:
I: To develop competence in written communication.
II: To inculcate innovative and critical thinking among the students.
III: To enable them to grasp the application of communication theories.
IV: To acquire knowledge of the latest technology related to communication skills.
V: To provide knowledge of multifarious opportunities in the field of this programme.

Course Contents:
1. Reading Skills: Reading tactics and strategies; Reading purposes–kinds of purposes and associated comprehension; Reading for direct meanings; Reading for understanding concepts, details, coherence, logical progression and meanings of phrases/ expressions.
Activities:
   a. Active reading of passages on general topics
   b. Reading newspaper, articles, editorials etc.
   c. Short questions based on content and development of ideas of a given paragraph.
2. Writing Skills: Guidelines for effective writing; writing styles for application, resume, personal letter, official/ business letter, memo, notices etc.
Activities:
   a) Personal and business letters.
   b) Converting a biographical note into a sequenced resume.
   c) Writing notices for circulation/ boards.

d) Making notes of given passage with headings and sub-headings
e) Writing newspaper reports based on given heading.

Recommended Books:
1. *Oxford Guide to Effective Writing and Speaking* by John Seely.
2. *The Written Word* by Vandana R Singh, Oxford University Press.
3. *Murphy's English Grammar* (by Raymond Murphy) CUP.

Course Outcomes:

The completion of this course enables students to:

1. Identify common errors in language and rectify them.

2. Develop and expand writing skills through controlled and guided activities.

3. Develop coherence, cohesion and competence in written discourse through intelligible pronunciation.

4. Develop the ability to handle the interview process confidently and learn the subtle nuances of an effective group discourse.

5. Communicate contextually in specific and professional situations with courtesy.

PRACTICAL (Marks: 15)

Course Contents:-

1. Reading dialogues (5 Marks)
2. Rapid reading (5 Marks)
3. Project File (5 Marks)

Compulsory Course
ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ

Credit & Marks Distribution, Eligibility and Pre-Requisites of the Course

Course title & Code	Total Teaching Hours	Credits	Credit distribution			Total Marks 100		Time Allowed in Exam	Eligibility criteria	Pre-requisite of the course (if any)
			Lecture	Tutorial	Practical	Theory	Internal Assessment			
ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ BPBI-1101	60	4	4	0	0	75	25	3 Hours	Class 12th pass in any stream	Studied Punjabi up to 10th Standard

ਕੋਰਸ ਦਾ ਉਦੇਸ਼ Course Objective	ਪਾਠ-ਕ੍ਰਮ ਨਤੀਜੇ Course Outcomes (COs)
▪ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਪੈਦਾ ਕਰਨਾ। ▪ ਆਲੋਚਨਾਤਮਕ ਰੁਚੀਆਂ ਵਿਕਸਤ ਕਰਨਾ। ▪ ਮਾਤ ਭਾਸ਼ਾ ਦੀ ਸਮਝ ਨੂੰ ਵਿਕਸਤ ਕਰਨਾ।	▪ ਉਸ ਵਿਚ ਸਾਹਿਤ ਰੁਚੀਆਂ ਵਿਕਸਤ ਹੋਣਗੀਆਂ। ▪ ਉਸ ਵਿਚ ਸਾਹਿਤ ਸਿਰਜਣਾ ਦੀ ਸੰਭਾਵਨਾ ਵਧੇਗੀ। ▪ ਉਸ ਵਿਚ ਕਿਸੇ ਵੀ ਵਿਸ਼ੇ ਦਾ ਗਹਿਨ ਅਧਿਐਨ ਕਰਨ ਦਾ ਬੋਧ ਹੋਵੇਗਾ। ▪ ਉਹ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਨਿਕਾਸ ਤੇ ਵਿਕਾਸ ਬਾਰੇ ਗਿਆਨ ਹਾਸਲ ਕਰਨਗੇ

ਅੰਕ-ਵੰਡ ਅਤੇ ਪ੍ਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

ਸਿਲੇਬਸ ਦੇ ਚਾਰ ਭਾਗ ਹਨ ਪਰ ਪ੍ਰਸ਼ਨ-ਪੱਤਰ ਦੇ ਪੰਜ ਭਾਗ ਹੋਣਗੇ। ਪਹਿਲੇ ਭਾਗ ਵਿਚ 1.5-1.5 (ਡੇਢ-ਡੇਢ) ਅੰਕ ਦੇ ਅਤਿ-ਸੰਖੇਪ (Objective Type) 10 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਜੋ ਕਿ ਸਾਰੇ ਸਿਲੇਬਸ ਵਿਚੋਂ ਹੋਣਗੇ। ਸਿਲੇਬਸ ਦੇ ਬਾਕੀ ਚਾਰ ਭਾਗਾਂ ਵਿਚ 02-02 ਲੇਖ ਨੁਮਾ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰੇਕ ਭਾਗ ਵਿਚੋਂ 01-01 ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜਮੀ ਹੋਵੇਗਾ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 15 ਅੰਕ ਹੋਣਗੇ। ਪੇਪਰ ਸੈੱਟਰ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਨੋਟ: ਇੰਟਰਨਲ ਅਸੈੱਸਮੈਂਟ 25 ਅੰਕਾਂ ਦੀ ਹੈ, ਜੋ ਕਾਲਜ ਵੱਲੋਂ ਨਿਰਧਾਰਿਤ ਦਿਸ਼ਾ ਨਿਰਦੇਸ਼ਾਂ ਅਨੁਸਾਰ ਥਿਊਰੀ ਅੰਕਾਂ ਤੋਂ ਵੱਖਰੀ ਹੋਵੇਗੀ। ਇਸ ਪੇਪਰ ਦੇ ਕੁੱਲ ਅੰਕ 75+25= 100 ਹਨ।

ਪਾਠ-ਕ੍ਰਮ

ਭਾਗ-ਪਹਿਲਾ

ਸਾਹਿਤ ਦੇ ਰੰਗ, ਡਾ. ਮਹਿਲ ਸਿੰਘ (ਸੰਪਾ.), ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।
ਭਾਗ ਪਹਿਲਾ – ਕਵਿਤਾ ਅਤੇ ਕਹਾਣੀ, ਡਾ. ਮਹਿਲ ਸਿੰਘ ਅਤੇ ਡਾ. ਆਤਮ ਰੰਧਾਵਾ (ਸਹਿ ਸੰਪਾ.)
(ਕਵਿਤਾ ਭਾਗ ਵਿਚੋਂ ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ/ਵਿਸ਼ਾ-ਵਸਤੂ। ਕਹਾਣੀ ਭਾਗ ਵਿਚੋਂ ਸਾਰ/ਵਿਸ਼ਾ-ਵਸਤੂ)

ਭਾਗ-ਦੂਜਾ

ਪੰਜਾਬ ਦੇ ਮਹਾਨ ਕਲਾਕਾਰ (ਸੰਪਾ. ਬਲਵੰਤ ਗਾਰਗੀ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।
(ਅੰਮ੍ਰਿਤਾ ਸ਼ੇਰਗਿੱਲ ਤੋਂ ਭਾਈ ਸਮੁੰਦ ਸਿੰਘ ਤਕ)
(ਵਿਸ਼ਾ-ਵਸਤੂ/ਸਾਰ/ਨਾਇਕ ਬਿੰਬ)

ਭਾਗ-ਤੀਜਾ

(ੳ) ਪੈਰ੍ਹਾ ਰਚਨਾ (ਤਿੰਨਾਂ ਵਿਚੋਂ ਇਕ)
(ਅ) ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ

ਭਾਗ-ਚੌਥਾ

(ੳ) ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ: ਭਾਸ਼ਾ ਦਾ ਟਕਸਾਲੀ ਰੂਪ, ਭਾਸ਼ਾ ਅਤੇ ਉਪ-ਭਾਸ਼ਾ ਵਿਚਲਾ ਅੰਤਰ, ਪੰਜਾਬੀ ਉਪ-ਭਾਸ਼ਾਵਾਂ ਦੇ ਪਛਾਣ-ਚਿੰਨ੍ਹ।
(ਅ) ਪੰਜਾਬੀ ਭਾਸ਼ਾ: ਨਿਕਾਸ ਤੇ ਵਿਕਾਸ।

B.Sc. (Information Technology) Semester – I

Compulsory Course
ਮੁਢਲੀ ਪੰਜਾਬੀ
(In Lieu of Compulsory Punjabi)

Credit & Marks Distribution, Eligibility and Pre-Requisites of the Course

Course title &Code	Total Teaching Hours	Credits	Credit distribution			Total Marks 100		Time Allowed in Exam	Eligibility criteria	Pre-requisite of the course (if any)
			Lecture	Tutorial	Practical	Theory	Internal Assessment			
ਮੁਢਲੀ ਪੰਜਾਬੀ BPBI-1102	60	4	4	0	0	75	25	3 Hours	Class 12th pass in any stream	NOT Studied Punjabi up to 10th Standard

ਕੋਰਸ ਦਾ ਉਦੇਸ਼ Course Objective	ਪਾਠ-ਕ੍ਰਮ ਨਤੀਜੇ Course Outcomes (COs)
• ਵਿਦਿਆਰਥੀ ਨੂੰ ਗੁਰਮੁਖੀ ਲਿਪੀ ਤੋਂ ਜਾਣੂ ਕਰਾਉਣਾ। • ਵਿਦਿਆਰਥੀ ਨੂੰ ਸ਼ੁੱਧ ਪੰਜਾਬੀ ਪੜ੍ਹਨਾ-ਲਿਖਣਾ ਸਿਖਾਉਣਾ। • ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀਆਂ ਵਿਆਕਰਨਕ ਬਾਰੀਕੀਆਂ ਤੋਂ ਜਾਣੂ ਕਰਾਉਣਾ। • ਸ਼ੁੱਧ ਸੰਚਾਰ ਨੂੰ ਵਿਕਸਤ ਕਰਨਾ।	• ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਤੇ ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀ ਸਿਖਲਾਈ ਵਿਚ ਮੁਹਾਰਤ ਹਾਸਲ ਕਰਨਗੇ। • ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿਚ ਮੁਹਾਰਨੀ, ਲਗਾਂ-ਮਾਤਰਾਂ, ਸਵਰ ਅਤੇ ਵਿਅੰਜਨ ਅੱਖਰਾਂ ਦੀ ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ ਸੰਬੰਧੀ ਸਮਝ ਵਿਕਸਿਤ ਹੋਵੇਗੀ। • ਪੰਜਾਬੀ ਸ਼ਬਦ-ਜੋੜਾਂ ਦੀ ਜਾਣਕਾਰੀ ਹਾਸਲ ਕਰਕੇ ਉਹ ਸ਼ੁੱਧ ਪੰਜਾਬੀ ਲਿਖਣ-ਪੜ੍ਹਨ ਦੇ ਸਮਰੱਥ ਹੋਣਗੇ। • ਉਹ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਸ਼ੁੱਧ ਰੂਪਾਂ ਦੀ ਜਾਣਕਾਰੀ ਹਾਸਲ ਕਰਨਗੇ।

ਅੰਕ-ਵੰਡ ਅਤੇ ਪ੍ਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

ਸਿਲੇਬਸ ਦੇ ਚਾਰ ਭਾਗ ਹਨ ਪਰ ਪ੍ਰਸ਼ਨ-ਪੱਤਰ ਦੇ ਪੰਜ ਭਾਗ ਹੋਣਗੇ। ਪਹਿਲੇ ਭਾਗ ਵਿਚ 01-01 ਅੰਕ ਦੇ ਅਤਿ-ਸੰਖੇਪ ਉੱਤਰ ਵਾਲੇ (Objective Type) 11 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਜੋ ਕਿ ਸਾਰੇ ਸਿਲੇਬਸ ਵਿੱਚੋਂ ਹੋਣਗੇ। ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਦੂਸਰੇ ਭਾਗ ਵਿਚ, ਸਿਲੇਬਸ ਦੇ ਪਹਿਲੇ ਭਾਗ ਵਿਚੋਂ ਤਿੰਨ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿੰਨਾਂ ਵਿੱਚੋਂ ਕੋਈ ਦੋ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 8-8 ਅੰਕ ਹੋਣਗੇ। ਇਸੇ ਤਰ੍ਹਾਂ ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਤੀਸਰੇ ਭਾਗ ਵਿਚ ਤਿੰਨ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਜਿੰਨਾਂ ਵਿੱਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 8-8 ਅੰਕ ਹੋਣਗੇ। ਭਾਗ ਚੌਥੇ ਵਿਚ ਪੰਜ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿੰਨਾਂ ਵਿੱਚੋਂ ਚਾਰ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 4-4 ਅੰਕ ਹੋਣਗੇ। ਭਾਗ ਪੰਜਵੇਂ ਵਿਚ ਦਸ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿੰਨਾਂ ਵਿੱਚੋਂ 8 ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ। ਹਰ ਪ੍ਰਸ਼ਨ ਦੇ 2-2 ਅੰਕ ਹੋਣਗੇ।
ਨੋਟ: ਇੰਟਰਨਲ ਅਸੈੱਸਮੈਂਟ 25 ਅੰਕਾਂ ਦੀ ਹੈ, ਜੋ ਕਾਲਜ ਵੱਲੋਂ ਨਿਰਧਾਰਿਤ ਦਿਸ਼ਾ ਨਿਰਦੇਸ਼ਾਂ ਅਨੁਸਾਰ ਥਿਊਰੀ ਅੰਕਾਂ ਤੋਂ ਵੱਖਰੀ ਹੋਵੇਗੀ। ਇਸ ਪੇਪਰ ਦੇ ਕੁੱਲ ਅੰਕ 75+25 = 100 ਹਨ।

ਪਾਠ-ਕ੍ਰਮ
ਭਾਗ-ਪਹਿਲਾ

(ੳ) ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਤੇ ਗੁਰਮੁਖੀ ਲਿਪੀ: ਨਾਮਕਰਣ ਤੇ ਸੰਖੇਪ ਜਾਣ-ਪਛਾਣ: ਗੁਰਮੁਖੀ ਵਰਣਮਾਲਾ, ਅੱਖਰ ਕ੍ਰਮ, ਸਵਰ ਵਾਹਕ (ੳ, ਅ, ੲ), ਲਗਾਂ-ਮਾਤਰਾਂ, ਪੈਰ ਵਿਚ ਬਿੰਦੀ ਵਾਲੇ ਵਰਨ, ਪੈਰ ਵਿਚ ਪੈਣ ਵਾਲੇ ਵਰਨ, ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ
(ਅ) ਸਿਖਲਾਈ ਤੇ ਅਭਿਆਸ

ਭਾਗ-ਦੂਜਾ

ਗੁਰਮੁਖੀ ਆਰਥੋਗਰਾਫੀ ਅਤੇ ਉਚਾਰਨ: ਸਵਰ, ਵਿਅੰਜਨ: ਮੁਢਲੀ ਜਾਣ-ਪਛਾਣ ਅਤੇ ਉਚਾਰਨ, ਮੁਹਾਰਨੀ, ਲਗਾਂ-ਮਾਤਰਾਂ ਦੀ ਪਛਾਣ

ਭਾਗ-ਤੀਜਾ

ਪੰਜਾਬੀ ਸ਼ਬਦ-ਜੋੜ: ਮੁਕਤਾ (ਦੋ ਅੱਖਰਾਂ ਵਾਲੇ ਸ਼ਬਦ, ਤਿੰਨ ਅੱਖਰਾਂ ਵਾਲੇ ਸ਼ਬਦ), ਸਿਹਾਰੀ ਵਾਲੇ ਸ਼ਬਦ, ਬਿਹਾਰੀ ਵਾਲੇ ਸ਼ਬਦ, ਔਂਕੜ ਵਾਲੇ ਸ਼ਬਦ, ਦੁਲੈਂਕੜ ਵਾਲੇ ਸ਼ਬਦ, ਲਾਂ ਵਾਲੇ ਸ਼ਬਦ, ਦੁਲਾਵਾਂ ਵਾਲੇ ਸ਼ਬਦ, ਹੋੜੇ ਵਾਲੇ ਸ਼ਬਦ, ਕਨੌੜੇ ਵਾਲੇ ਸ਼ਬਦ, ਲਗਾਖਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ) ਵਾਲੇ ਸ਼ਬਦ

ਭਾਗ-ਚੌਥਾ

ਸ਼ੁੱਧ-ਅਸ਼ੁੱਧ ਸ਼ਬਦ

B.Sc. (Information Technology) Semester – I

PUNJAB HISTORY & CULTURE (From Earliest Times to C 320)
(Special Paper in lieu of Punjabi compulsory)
(For those students who are not domicile of Punjab)
Course Code: BPHC-1104

Credit Hours (per week): 04
L- T- P
4 -0- 0
Time: 3 Hours
Total Marks: 100
Theory: 75
Internal Assessment: 25

Instructions for the Paper Setters:
        Question paper should consist of two sections—Section A and Section B. The paper setter must ensure that questions in Section–A do not cover more than one point, and questions in Section–B should cover at least 50 per cent of the theme.

        Section–A: The examiner will set 15 objective type questions out of which the candidate shall attempt any 10 questions, each carrying 1½ marks. The total weightage of this section will be 15 marks. Answer to each question should be in approximately one to two sentences.

        Section–B: The examiner will set 8 questions, two from each Unit. The candidate will attempt 4 questions selecting one from each Unit in about 1000 words. Each question will carry 15 marks. The total weightage of this section will be 60 marks.

Note: **The examiner is to set the question paper in two languages: English & Hindi.**

        Course Objectives: The main objective of this course is to educate the history and culture of the Ancient Punjab to the students who are not domicile of the Punjab. It aims to familiarize these students with the physical features of ancient Punjab and its impact on its history and culture. It also provides them information about the different sources to construct the history and culture of the ancient Punjab. The course intends to provide knowledge of social, economic, religious life of the Harappan civilization, Indo-Aryans, teachings and impact of Jainism and Buddhism in the Punjab.

Unit-I
1.   Physical features of the Punjab and impact on history.
2.   Sources of the ancient history of Punjab.

Unit-II
3.   Harappan Civilization: Town planning; social, economic and
        religious life of the Indus Valley People.
4.   The Indo-Aryans: Original home and settlement in Punjab.

Unit-III

5.   Social, Religious and Economic life during Rig Vedic Age.
6.   Social, Religious and Economic life during later Vedic Age.

Unit-IV

7.   Teachings and impact of Buddhism.
8.   Jainism in the Punjab.

Suggested Readings:-

L. Joshi (ed), *History and Culture of the Punjab*, Art-I, Patiala, 1989 (3rd edition)

L.M. Joshi and Fauja Singh (ed*), History of Punjab*, Vol. I, Patiala 1977.

Budha Parkash, *Glimpses of Ancient Punjab*, Patiala, 1983.

B.N. Sharma, *Life in Northern India*, Delhi. 1966.

Course Outcomes:

On Completing the Course, the Students will be able to :

CO-1 Learn the history and culture of the Ancient Punjab.
CO-2   Study the physical features of ancient Punjab.
CO-3 Understand about the sources of the history of the Punjab.
CO-4 Analyse the social, economic, religious life of the Harappan civilization and Vedic-Aryans.
CO-5 Learn the teachings and impact of Jainism and Buddhism in the Punja

Credits		
L	**T**	**P**
0	0	4

Total Marks: 100
Practical Marks: 75
Practical Internal Assessment Marks: 25

Course Objectives:

1.	Teach the fundamentals so students can efficiently use MS Word
2.	Provide a knowledge base for Computer Fundamentals & MS Word upon which you can build.
3.	Use real-world examples and procedures that will prepare you to be a skilled user of Computer & MS Word, MS Power Point & MS Excel.
4.	Provide hands-on use of Microsoft Office applications Word, Excel and Power Point. Completion of the assignments will result in MS Office applications knowledge and skills.

Practical- MS Office 2010/Open Office

MS–Word 2010:

1. Anatomy of Word Window
2. Creation, Saving, Opening document
3. Formatting (Character, line and page)
4. Finding and replacing text
5. Inserting files, page numbers, bookmarks, symbols, dates, page breaks, page numbers and Headers and Footers.
6. Creating a Table and various operations applied on it
7. Page Layout(page setup, margin, watermark, orientation, page border, indentation)
8. Mail Merge (using wizards).

MS Power Point 2010:

1. Components of Power point
2. Creation, opening and saving presentation
3. Inserting information, table, graphs, picture, clip Art, audio and video
4. Apply transition, animation.
5. Views (normal, slide sorter view, notes page, reading view)

MS Excel 2010:

1. Exploring Spreadsheet window

2. Entering, Editing and formatting data (Conditional)
3. Entering and Editing Formulas, inbuilt functions
4. Absolute, Relative and mixed referencing
5. Filtering

Course Outcomes:

Upon completion of this course, the students will be able to:

CO-1.	Identify the applications of computer in daily life.
CO-2.	Understand the practical concepts of MSWord, MS Excel and MS PowerPoint.
CO-3.	Knowledge and understanding on successful completion of this subject the students have the ability to perform tools of MS Office.
CO-4.	Develop skills of working with MS Word, MS Powerpoint, MS excel.

B.Sc. (Information Technology) Semester – I
BIT-115P: Lab-II C Language
Skill Enhancement Course (SEC)

Credits		
L	**T**	**P**
0	0	4

M. Marks: 100
Practical Marks: 75
Practical Internal Assessment Marks: 25

Course Objectives:

1.	To learn the fundamental programming concepts and methodologies which are essential to building good C programs.
2.	To practice the fundamental programming methodologies in the C programming language via laboratory experiences. Microsoft Visual Studio is the programming environment that will used.
3.	To code, document, test and implement a well-structured, robust computer program using the C programming language.
4.	To write reusable modules (collections of functions).

Practical- Practical Programming in C

Course Outcomes:

Upon completion of this course, the students will be able to:

CO-1.	Use the fundamentals of C programming in trivial problem solving.
CO-2.	Apply skill of identifying appropriate programming constructs for problem solving.
CO-3.	Ability to work with arrays of complex objects.
CO-4.	Enhance skill on problem solving by constructing algorithms.
CO-5.	Apply skill of identifying appropriate programming constructs for problem Solving.

Programming based on following topics

Introduction to C: Basic programs of C.

I/O Functions: formatted functions (printf(), scanf()) and Unformatted functions(getchar(), getche(), getch(), gets(), putchar(), putch() and puts())

Storage Classes: auto, register, static, extern.

Operators: Arithmetic operators, Unary operators, Relational Operators, Logical Operators, Assignment and Conditional Operators

Control Statements: Decision making statements (if and switch), Iterative statements (while, do–while and for statements, nested loops) and transfer statements (break, continue and goto statements)

Functions: defining and accessing functions, passing arguments to function, and recursion.

Arrays: Defining and accessing one dimensional array element, passing arrays to a function, multi–dimensional arrays.

Strings: string inbuilt functions

Structures & Unions: Defining, accessing structure and union variables.

Pointer: Declarations and Accessing pointer variables and operations on pointers.

Data Files: File opening and closing, Modes (reading, writing).

B.Sc. (Information Technology) Semester – I
Course Code: ZDA111
Course Title- Drug Abuse: Problem, Management and Prevention
PROBLEM OF DRUG ABUSE
(Compulsory for all Under Graduate Classes)

Credit hrs./wk.:2

Time: 3 Hours   Max. Marks: 50

Instructions for the Paper Setters:
1) There will be a total of 9 questions of which 5 are to be attempted.
2) Question 1 is compulsory and having 10 short answer type questions (1 mark each).
3) The remaining 8 questions (10 marks each) shall include 2 questions from each unit. Candidates shall be required to attempt 4 questions, one from each unit. Preferably, the question should not be split into more than two sub-parts.

Course Objectives- The course aims to:

CO-1.	Generate the awareness against drug abuse.
CO-2.	Describe a variety of models and theories of addiction and other problems related to substance abuse.
CO-3.	Describe the behavioral, psychological, physical health and social impact of psychoactive substances.
CO-4.	Provide culturally relevant formal and informal education programs that raise awareness and support for substance abuse prevention and the recovery process.
CO-5.	Describe factors that increase likelihood for an individual, community or group to be at risk of substance use disorders.

UNIT–I
- **Meaning of Drug Abuse**
  Meaning of drug abuse
  Nature and Extent of Drug Abuse: State and National Scenario

UNIT-II
- **Consequences of Drug Abuse for**
  Individual: Education, Employment, Income.
  Family   : Violence.
  Society   : Crime.
  Nation   : Law and Order problem.

UNIT-III
- **Management of Drug Abuse**
  Medical Management: Medication for treatment of different types of drug abuses.
  Medication to reduce withdrawal effects.

UNIT-IV
- Psychiatric Management: Counseling, Behavioral and Cognitive therapy.
- Social Management: Family, Group therapy and Environmental Intervention.

References:

1. Ahuja, Ram (2003), Social Problems in India, Rawat Publication, Jaipur.
2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
3. Inciardi, J.A. 1981. The Drug Crime Connection. Beverly Hills: Sage Publications. 23
4. Jasjit Kaur Randhawa & Samreet Randhawa, "Drug Abuse-Problem, Management & Prevention", KLS, ISBN No. 978-81-936570-6-5, (2018).
5. Jasjit Kaur Randhawa & Samreet Randhawa, "Drug Abuse Problem, Management & Prevention", KLS, ISBN No. 978-81-936570-8-9, (2019).
6. Jasjit Kaur Randhawa & Samreet Randhawa, "voZrI d[otos'A^(BPky'oh) ;wZf;nk, gqpzXB ns/o'eEkw", KLS, ISBN No. 978-81-936570-7-1, (2018).
7. Jasjit Kaur Randhawa, "Drug Abuse -Management & Prevention", KLS, ISBN No. 978-93-81278-80-2, (2018).
8. Kapoor. T. (1985) Drug epidemic among Indian Youth, New Delhi: Mittal Pub.
9. Modi, Ishwar and Modi, Shalini (1997) Drugs: Addiction and Prevention, Jaipur: Rawat Publication.
10. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
11. Rama Gandotra & Jasjit Kaur Randhawa, "voZrI d[otos'A^(BPky'oh) gqpzXB ns/ o'eEkw", KLS, ISBN No. 978-93-81278-87-1, (2018).
12. Sain, Bhim 1991, Drug Addiction Alcoholism, Smoking obscenity New Delhi: Mittal Publications.
13. Sandhu, Ranvinder Singh, 2009, Drug Addiction in Punjab: A Sociological Study. Amritsar. Guru Nanak Dev University.
14. Singh, C. P. 2000. Alcohol and Dependence among Industrial Workers: Delhi: Shipra.
15. Sussman, S and Ames, S.L. (2008). Drug Abuse: Concepts, Prevention and Cessation, Cambridge University Press.
16. World Drug Report 2010, United Nations office of Drug and Crime.
17. World Drug Report 2011, United Nations office of Drug and Crime.

Course Outcomes:
The students will be able:

CO-1.	To describe issues of cultural identity, ethnic background, age and gender in prevention, treatment and recovery.
CO-2.	To describe warning sign, symptoms, and the course of substance use disorders.
CO-3.	To describe principles and philosophy of prevention, treatment and recovery.
CO-4.	To describe current and evidenced-based approaches practiced in the field of drug addiction.

B.Sc. (Information Technology)

Semester-II

S N	Course Code	Course Name	Distribution of The Marks				Lectures Per week			Credit Distribution			Total Credit L+T+P	Page No.
			Theory	Internal Assessment	Practical	Total	L	T	P	L	T	P		
					Discipline Specific Course(DSC)									
1	BIT-121 (Major)	Principles of Digital Electronics	75	25	-	100	5	1	0	3	1	0	4	23-24
2	BIT-122 (Major)	Introduction to Programming-C++	75	25	-	100	5	1	0	3	1	0	4	25-26
3	BIT-123 (Major)	Numerical Methods & Statistical Techniques	75	25	-	100	5	1	0	3	1	0	4	27-28
					Ability Enhancement Course (AEC)									
4	BCSE-1222	Communication Skills in English	60	25	15	100	4	0	2	3	0	1	4	29-30
5	BHPB-1201/ BPBI-1202/ BPHC-1204	Punjabi /Basic Punjabi (Mudhli Punjabi) (Compulsory) / Punjab History & Culture	75	25	-	100	6	0	0	4	0	0	4	31 32 33-34
					Skill Enhancement Course(SEC)									
6	BIT-124P	Lab-I Practical-C++Programming Language	-	25	75	100	0	0	6	0	0	4	4	35-36
7	BIT-125P	Lab-II Implementation of Numerical Methods in C/C++	-	25	75	100	0	0	6	0	0	4	4	37
					Value Added Course (VAC)									
8	BDA121	*Drug Abuse: Problem, Management and Prevention(Compulsory paper)	-	-	-	50	3	0	0	2	0	0	2	38-39
												Total Credits=30		

Note: * This paper marks will not be included in the total marks.

B.Sc. (Information Technology) Semester – II

BIT-121: Principles of Digital Electronics
Discipline Specific Course (DSC)

Time: 3 Hours

Total Marks: 100
Theory Marks: 75
Theory Internal Assessment M: 25

Credits		
L	**T**	**P**
3	1	0

Note for paper setter and students:

1. Medium of Examination is English Language.
2. There will be five sections.
3. Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 mark each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.
4. Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The students are required to attempt one question from each of these sections.

Course Objectives:

1.	To familiarize the concept of various number systems.
2.	To introduce the concept of logic gates and logic families.
3.	To acquire the knowledge of the minimization techniques in digital electronics.
4.	To design combinational circuits and sequential circuits using logic gates.
5.	To impart knowledge of how to design registers in digital electronics.
6.	To understand the concept of digital logic levels.

UNIT-I

1. Number Systems: Introduction to Decimal, Binary, Octal and Hexadecimal Numbers. Complements. Signed Binary Numbers (Arithmetic Addition & Subtraction), Binary Codes (BCD, Excess-3, Gray codes, ASCII), Binary Storage and Registers.

2. Boolean Algebra and Logic Gates: Basic Definitions, Postulates and theorems of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, De-Morgan's Theorem Reducing Boolean expressions, Digital Logic Gates: (AND, OR NOT, NAND, NOR, EX-OR, EX- NOR), Implementations using Basic Gates, Universal Gates.

UNIT -II

3. Minimization Techniques: Canonical and Standard forms SOP and POS of Boolean functions, K-Maps simplifications up to Five-Variable Map, Sum of Products and Product of Sums Simplification, Don't-Care Conditions.

4. Combinational Logic: Half Adder and Full Adder, Binary Adder and Subtractor, Decimal Adder, Comparator, Decoders, Encoders, Multiplexers.

UNIT-III

5. Synchronous Sequential Logic: Sequential Circuits, Latches, Flip-Flops (SR, JK, JK Master Slave, D and T-type). Negative edge and Positive edge triggered clocks

6. Registers and Counters: Shift Registers (Serial-in Serial-out, Serial-in Parallel-out, Parallel-in Serial-out, Parallel-in Parallel-out), Ripple Counters, Synchronous and Asynchronous Counters, Mod counters up/down counters.

UNIT -IV

7. Memory and Programmable Logic: Introduction, Random-Access Memory, Memory Decoding, Error Detection and Correction, Read-Only Memory, Programmable Array Logic.

8. Computer Concepts: Basic Computer System, concepts of hardware and software, Operating Systems, Microcontrollers and Embedded Systems., Digital Signal Processing, Digital Signal Processor (DSP).

References:

1. Integrated Electronics by Millman, Halkias McGraw Hill.
2. Malvino: Digital Computer Electronics, McGraw Hill.
3. D.A. Hodges & H.G. Jackson, Analysis and Design of Integrated Circuits, International, 1983.
4. Joph. F. Wakerley, Digital Principles and Practices.
5. Ujjenbeck, John: Digital Electronics: A Modern Approach, Prentice Hall, 1994.
6. Mano, M. Morris: Digital Logic and Computer Design, Edition, 1993
7. Electronics by R.K Gaur.

Course Outcomes:

 On Completing the course, the students will be able to:

CO-1	Gain knowledge of different types of number systems and their conversions in digital electronics.
CO-2	Use Boolean algebra to minimize and simplify boolean expressions
CO-3	Illustrate realization of SOP and POS forms
CO-4	Design of various combinational circuits using logic gates
CO-5	Design and develop sequential circuits using flip flops.

B.Sc. (Information Technology) Semester – II
BIT-122: Introduction to Programming - C++
Discipline Specific Course (DSC)

Time: 3 Hours

Total Marks: 100
Theory Marks: 75
Theory Internal Assessment Marks: 25

Credits		
L	**T**	**P**
3	1	0

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 mark each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The students are required to attempt one question from each of these sections.**

Course Objectives:

1.	To learn the fundamental programming concepts and methodologies which are essential to building good C++ programs.
2.	To practice the fundamental programming methodologies in the C++ programming language via laboratory experiences. Microsoft Visual Studio is the programming environment that will be used.
3.	To code, document, test, and implement a well-structured, robust computer program using the C++ programming language.
4.	To write reusable modules (collections of functions).

UNIT-I

1. **Getting Started:**. Introduction, A brief history of C++, Variables , constants, Expression, Statements, Comments and keywords of C++, Operators in C++: Arithmetic, Relational, Logical,Assignment, Increment/Decrement, Conditional, Precedence of Operators , Data type, Type Conversion, library function.

2. **Input / Output Statements** : Inputting using in and outputting using cout statements. Preprocessor directives, Basic program construction. A Complete C++ Program: Invoking Turbo C++, naming your program, using the editor, saving your program, compiling and linking, running the program. Errors : Compiler, linker and runtime. Other IDE Features: Compiling and linking shortcut exiting from IDE, examining files, opening an existing file, DOS shell.

UNIT -II

3. **Decision Making and Looping Statement :** If Statement, If-else statement, nesting of if statement, switch statement, conditional operator statement.
While loop, do loop, for loop, nesting of loops, break and continue statement, go to statement.

4. **Arrays :** Defining an array, array type, array elements, Accessing and initializing elements of array, Programming of C++ with array, String handling, array of strings.

UNIT-III
5. Functions : Definition of function, Declaring function, Local, global variables, execution of function, Passing argument to function, Return values Reference arguments, Overloading functions, Inline function, friend function and default parameter., Storage classes.

6. **Structures:** A simple structure, specifying the structure, defining a structure variable, Accessing Structure member, Other structure features. Structure within structure. Structure and classes. Array of structures.

7. Object Oriented Programming Objects & Classes, Constructor & Destructor, Operator overloading: Overloading unary operators, Overloading binary operators, Data conversion, Pitfalls operator overloading and conversion.

UNIT -IV
8. Inheritance Derived class and Base Class, Derived Class Constructors, Overriding member functions, Inheritance in the English distances class, class hierarchies, Public and Private Inheritance, Level of inheritance.

9. Polymorphism: Problems with single inheritance, Multiple inheritance, Virtual Functions**,** Pure Virtual Functions.

References:

1. C++ & Graphics by Vijay Mukhi's
2. Turbo C++ by Robert Lafore.
3. C++ Programming Language by Schaum's outline series.
4. Object –Oriented Programming with C++ by E. Balagursamy, 2017 edition.
5. C++, The Complete Reference by Herbert Schildt.

Course Outcomes:

On Completing the course, the students will be able to:

CO-1.	Use the fundamentals of C programming in trivial problem solving.
CO-2.	Enhance skill on problem solving by constructing algorithms.
CO-3.	Identify solution to a problem and apply control structures and user defined functions for solving the problem.
CO-4.	Apply skill of identifying appropriate programming constructs for problem Solving.

BIT-123: Numerical Methods and Statistical Techniques
Discipline Specific Course (DSC)

Time: 3 Hours

Credits		
L	**T**	**P**
3	1	0

Total Marks: 100
Theory Marks: 75
Theory Internal Assessment M: 25

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 mark each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The students are required to attempt one question from each of these sections.**

Course Objectives:

1.	To enhance the problem solving skills of engineering students using an extremely powerful problem solving tool namely numerical methods.
2.	This will help students choose, develop and apply the appropriate numerical techniques for your problem, interpret the results, and assess accuracy.

3.	The problems cover
	
	  I. Systems of linear equations; linear least squares problems
	
	  II. Interpolation and approximation.

UNIT-I

Introduction:
1. Numerical Methods, Numerical methods versus numerical analysis, Errors and Measures of Errors.
2. Non–linear Equations, iterative Solutions, Multiple roots and other difficulties, Interpolation methods, Methods of bi–section, False position method, Newton Raphson – method.
3. Simultaneous Solution of Equations, Gauss Elimination Method, Gauss Jordan Method.

UNIT –II

4. Numerical Integration and different Trapezoidal Rule, Simpson's 3/8 Rule.
5 Interpolation and Curve Fitting, Lagrangian Polynomials, Newton's Methods: Forward Difference Method, Backward Difference Method Divided Difference Method.

UNIT -III

6 Least square fit linear trend, Non–linear trend.

$Y = ax^b$
$Y = ab^x$
$Y = ae^x$
Polynomial fit: $Y = a+bx+cx^2$
Statistical Techniques:
1. Measure of Central Tendency, Mean Arithmetic, Mean Geometric, Mean Harmonic, Mean, Median, Mode.

UNIT -IV

Statistical Techniques:
2. Measure of Dispersion, Mean Deviation, Standard Deviation, Co–efficient of Variation.

References:
1. V. Rajaraman: Computer Oriented Numerical Methods, Prentice Hall of India Private Ltd., New Delhi.
2. B.S. Grewal, Numerical Methods for Engineering, Sultan Chand Publication.
3. V. Rajaraman: Computer Oriented Numerical Methods, Prentice Hall of India Private Ltd., New Delhi.
4. S.P Gupta, Statistical Methods, Sultan Chand & Sons Publications.

Course Outcomes:

On completion of this course students will able to:

CO-1.	Understand numerical techniques to find the roots of non-linear equations and solution of system of linear equations.
CO-2.	Apply numerical methods to obtain approximate solutions to mathematical problems.
CO-3.	Understand the difference operators and the use of interpolation.
CO-4.	Analyses and evaluate the accuracy of common numerical methods
CO-5.	Interpret calculation and errors in numerical method.
CO-6.	Writes mathematical solutions and their interpretation in a clear and concise manner.

COMMUNICATION SKILLS IN ENGLISH
Code:BCSE-1222

Time: 3 Hours   **Max. Marks: 100**
                                                                                                      Theory: 60

L	T	P	Credits
3	0	1	4

                                                                                                   Practical: 15
                                                                                  Internal Assessment: 25

Suggested Pattern of Question Paper:
The question paper will be divided into two sections. Section A will consist of Twelve(12) questions of One(1) mark each. Section B will consist of Six questions of Eight(8) marks each. There will be internal choice wherever possible.

Section A

1. Do as directed
   Tenses and Change of voice

                                                                                          (12X1=12Marks)

Section B

1. **Listening Skills**: Barriers to listening; effective listening skills; feedback skills.
2. **Speaking and Conversational Skills:** Components of a meaningful and easy conversation; understanding the cue and making appropriate responses; forms of polite speech; asking and providing information on general topics.
3. Drafting of a short speech on a given topic.
4. Transcoding (given dialogue to prose or given prose to dialogue).
5. Taking notes on a speech/lecture/telephonic conversations .
6. Translation from Vernacular (Punjabi/ Hindi) to English (Paragraph)

                                                                                          (6X8=48 Marks)

Course Objectives:
I: To develop competence in oral and visual communication.
II: To inculcate innovative and critical thinking among the students.
III: To enable them to grasp the application of communication theories.
IV: To acquire knowledge of the latest technology related to communication skills.
V: To provide knowledge of multifarious opportunities in the field of this programme.

Course Contents:
 1. **Listening Skills:** Barriers to listening; effective listening skills; feedback skills, attending telephone calls; note taking.
     Activities:
     a) Listening exercises – Listening to conversation, speech/ lecture and taking notes.
 2. **Speaking and Conversational Skills**: Components of a meaningful and easy conversation; understanding the cue and making appropriate responses; forms of polite speech; asking and providing information on general topics, situation based Conversation in English; essentials of Spoken English
     Activities:
     a) Conversation; dialogue and speech
 b) Oral description or explanation of a common object, situation or concept.
 c) Interviews and group discussion

Recommended Books:
1. *Oxford Guide to Effective Writing and Speaking* by John Seely.
2. *The Written Word* by Vandana R Singh, Oxford University Press
3. *Murphy's English Grammar* (by Raymond Murphy) CUP

Course Outcomes:

The completion of this course enables students to:

1. Identify common errors in language and rectify them.

2. Develop and expand Oral skills through controlled and guided activities.

3. Develop coherence, cohesion and competence in oral discourse through intelligible   pronunciation.

4. Develop the ability to handle the interview process confidently and learn the subtle nuances of an effective group discourse.

5. Communicate contextually in specific and professional situations with courtesy.

PRACTICAL (Marks: 15)
Course Contents:-
1. Oral Presentation. (5 Marks)
2. Group Discussion. (5 Marks)
3. Mock Interview (5 Marks)

Compulsory Course
ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ

Credit & Marks Distribution, Eligibility and Pre-Requisites of the Course

Course title & Code	Total Teaching Hours	Credits	Credit distribution			Total Marks 100		Time Allowed in Exam	Eligibility criteria	Pre-requisite o the course (if any)
			Lecture	Tutorial	Practical	Theory	Internal Assessment			
ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ BHPB-1201	60	4	4	0	0	75	25	3 Hours	Class 12th pass in any stream	--

ਕੋਰਸ ਦਾ ਉਦੇਸ਼ Course Objective	ਪਾਠ-ਕ੍ਰਮ ਨਤੀਜੇ Course Outcomes (COs)
▪ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਪੈਦਾ ਕਰਨਾ। ▪ ਆਲੋਚਨਾਤਮਕ ਰੁਚੀਆਂ ਨੂੰ ਵਿਕਸਤ ਕਰਨਾ। ▪ ਵਿਦਿਆਰਥੀ ਨੂੰ ਦਫ਼ਤਰੀ ਅਤੇ ਘਰੇਲੂ ਚਿੱਠੀ ਪੱਤਰ ਤੋਂ ਜਾਣੂ ਕਰਵਾਉਣਾ। ▪ ਭਾਸ਼ਾਈ ਗਿਆਨ ਵਿਚ ਵਾਧਾ ਕਰਨਾ।	▪ ਉਸ ਅੰਦਰ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਪ੍ਰਫੁਲਿਤ ਹੋਣਗੀਆਂ। ▪ ਉਸ ਅੰਦਰ ਸਾਹਿਤ ਸਿਰਜਨਾ ਦੀ ਸੰਭਾਵਨਾ ਵਧੇਗੀ। ▪ ਵਿਦਿਆਰਥੀ ਚਿੱਠੀ-ਪੱਤਰ ਦੀ ਲਿਖਣ ਸ਼ੈਲੀ ਤੋਂ ਜਾਣੂ ਹੋਵੇਗਾ। ▪ ਉਹ ਭਾਸ਼ਾਈ ਬਣਤਰ ਤੋਂ ਜਾਣੂ ਹੋਵੇਗਾ।

ਅੰਕ-ਵੰਡ ਅਤੇ ਪ੍ਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

ਸਿਲੇਬਸ ਦੇ ਚਾਰ ਭਾਗ ਹਨ ਪਰ ਪ੍ਰਸ਼ਨ-ਪੱਤਰ ਦੇ ਪੰਜ ਭਾਗ ਹੋਣਗੇ। ਪਹਿਲੇ ਭਾਗ ਵਿਚ 1.5-1.5 (ਡੇਢ-ਡੇਢ) ਅੰਕ ਦੇ ਅਤਿ-ਸੰਖੇਪ (Objective Type) 10 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਜੋ ਕਿ ਸਾਰੇ ਸਿਲੇਬਸ ਵਿਚੋਂ ਹੋਣਗੇ। ਸਿਲੇਬਸ ਦੇ ਬਾਕੀ ਚਾਰ ਭਾਗਾਂ ਵਿਚ 02-02 ਲੇਖ ਨੁਮਾ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰੇਕ ਭਾਗ ਵਿਚੋਂ 01-01 ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੋਵੇਗਾ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 15 ਅੰਕ ਹੋਣਗੇ। ਪੇਪਰ ਸੈੱਟਰ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਨੋਟ: ਇੰਟਰਨਲ ਅਸੈੱਸਮੈਂਟ 25 ਅੰਕਾਂ ਦੀ ਹੈ, ਜੋ ਕਾਲਜ ਵੱਲੋਂ ਨਿਰਧਾਰਿਤ ਦਿਸ਼ਾ ਨਿਰਦੇਸ਼ਾਂ ਅਨੁਸਾਰ ਥਿਊਰੀ ਅੰਕਾਂ ਤੋਂ ਵੱਖਰੀ ਹੋਵੇਗੀ। ਇਸ ਪੇਪਰ ਦੇ ਕੁੱਲ ਅੰਕ 75+25= 100 ਹਨ।

ਪਾਠ-ਕ੍ਰਮ
ਭਾਗ-ਪਹਿਲਾ

ਸਾਹਿਤ ਦੇ ਰੰਗ, ਡਾ. ਮਹਿਲ ਸਿੰਘ (ਸੰਪਾ.), ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।
ਭਾਗ ਦੂਜਾ - ਵਾਰਤਕ ਅਤੇ ਰੇਖਾ-ਚਿੱਤਰ, ਡਾ. ਪਰਮਿੰਦਰ ਸਿੰਘ, ਡਾ. ਭੁਪਿੰਦਰ ਸਿੰਘ ਅਤੇ ਡਾ.ਕੁਲਦੀਪ ਸਿੰਘ ਢਿੱਲੋਂ (ਸਹਿ ਸੰਪਾ.)
(ਵਾਰਤਕ ਭਾਗ ਵਿਚੋਂ ਸਾਰ/ਵਿਸ਼ਾ-ਵਸਤੂ। ਰੇਖਾ-ਚਿੱਤਰ ਭਾਗ ਵਿਚੋਂ ਸਾਰ/ਨਾਇਕ ਬਿੰਬ)

ਭਾਗ-ਦੂਜਾ

ਪੰਜਾਬ ਦੇ ਮਹਾਨ ਕਲਾਕਾਰ (ਸੰਪਾ. ਬਲਵੰਤ ਗਾਰਗੀ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।
(ਸਤੀਸ਼ ਗੁਜਰਾਲ ਤੋਂ ਸੁਰਿੰਦਰ ਕੌਰ ਤਕ)
(ਵਿਸ਼ਾ-ਵਸਤੂ/ਸਾਰ/ਨਾਇਕ ਬਿੰਬ)

ਭਾਗ-ਤੀਜਾ

(ੳ) ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ
(ਅ) ਮੁਹਾਵਰੇ ਅਤੇ ਅਖਾਣ

ਭਾਗ-ਚੌਥਾ

(ੳ) ਸ਼ਬਦ-ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ-ਰਚਨਾ – ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਮੁੱਢਲੇ ਸੰਕਲਪ
(ਅ) ਸ਼ਬਦ-ਸ਼੍ਰੇਣੀਆਂ

Compulsory Course
ਮੁਢਲੀ ਪੰਜਾਬੀ
(In Lieu of Compulsory Punjabi)

Credit & Marks Distribution, Eligibility and Pre-Requisites of the Course

Course title & Code	Total Teaching Hours	Credits	Credit distribution			Total Marks 100		Time Allowed in Exam	Eligibility criteria	Pre-requisite of the course (if an
			Lecture	Tutorial	Practical	Theory	Internal Assessment			
ਮੁਢਲੀ ਪੰਜਾਬੀ BPBI-1202	60	4	4	0	0	75	25	3 Hours	Class 12th pass in any stream	

ਕੋਰਸ ਦਾ ਉਦੇਸ਼ Course Objective	ਪਾਠ-ਕ੍ਰਮ ਨਤੀਜੇ Course Outcomes (COs)
• ਵਿਦਿਆਰਥੀ ਅੰਦਰ ਸ਼ਬਦ ਬਣਤਰ ਦੀ ਸਮਝ ਵਿਕਸਤ ਕਰਨਾ। • ਵਿਦਿਆਰਥੀ ਨੂੰ ਸ਼ਬਦ ਪ੍ਰਕਾਰ ਬਾਰੇ ਜਾਣਕਾਰੀ ਪ੍ਰਦਾਨ ਕਰਨਾ। • ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਵਿਆਕਰਨਕ ਪ੍ਰਬੰਧ ਸੰਬੰਧੀ ਗਿਆਨ ਕਰਾਉਣਾ। • ਸਿਖਲਾਈ ਤੇ ਅਭਿਆਸ ਦੁਆਰਾ ਪੰਜਾਬੀ ਸ਼ਬਦ ਭੰਡਾਰ ਵਧਾਉਣਾ।	• ਉਹ ਪੰਜਾਬੀ ਸ਼ਬਦ-ਬਣਤਰ ਦੀ ਜਾਣਕਾਰੀ ਹਾਸਲ ਕਰਕੇ ਭਾਸ਼ਾਈ ਗਿਆਨ ਨੂੰ ਵਿਕਸਿਤ ਕਰਨਗੇ। • ਪੰਜਾਬੀ ਸ਼ਬਦ-ਰਚਨਾ ਸੰਬੰਧੀ ਮੁਹਾਰਤ ਹਾਸਲ ਕਰਨਗੇ। • ਵਿਦਿਆਰਥੀ ਸ਼ਬਦਾਂ ਦੀਆਂ ਭਿੰਨ-ਭਿੰਨ ਕਿਸਮਾਂ ਤੋਂ ਜਾਣੂ ਹੋਵੇਗਾ। • ਵਿਦਿਆਰਥੀਆਂ 'ਚ ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ ਭੰਡਾਰ 'ਚ ਵਾਧਾ ਹੋਵੇਗਾ।

ਅੰਕ-ਵੰਡ ਅਤੇ ਪ੍ਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

ਸਿਲੇਬਸ ਦੇ ਚਾਰ ਭਾਗ ਹਨ ਪਰ ਪ੍ਰਸ਼ਨ-ਪੱਤਰ ਦੇ ਪੰਜ ਭਾਗ ਹੋਣਗੇ। ਪਹਿਲੇ ਭਾਗ ਵਿਚ 01-01 ਅੰਕ ਦੇ ਅਤਿ-ਸੰਖੇਪ ਉੱਤਰ ਵਾਲੇ (Objective Type) 11 ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਜੋ ਕਿ ਸਾਰੇ ਸਿਲੇਬਸ ਵਿਚੋਂ ਹੋਣਗੇ। ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਦੂਸਰੇ ਭਾਗ ਵਿਚ, ਸਿਲੇਬਸ ਦੇ ਪਹਿਲੇ ਭਾਗ ਵਿਚੋਂ ਤਿੰਨ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿੰਨਾਂ ਵਿਚੋਂ ਕੋਈ ਦੋ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 8-8 ਅੰਕ ਹੋਣਗੇ। ਇਸੇ ਤਰ੍ਹਾਂ ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਤੀਸਰੇ ਭਾਗ ਵਿਚ ਤਿੰਨ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਜਿੰਨਾਂ ਵਿਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 8-8 ਅੰਕ ਹੋਣਗੇ। ਭਾਗ ਚੌਥੇ ਵਿਚ ਪੰਜ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿੰਨਾਂ ਵਿਚੋਂ ਚਾਰ ਪ੍ਰਸ਼ਨ ਹੱਲ ਕਰਨੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 4-4 ਅੰਕ ਹੋਣਗੇ। ਭਾਗ ਪੰਜਵੇਂ ਵਿਚ ਤਿੰਨ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਜਿੰਨਾਂ ਵਿਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਲਾਜ਼ਮੀ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ 8-8 ਅੰਕ ਹੋਣਗੇ।

ਨੋਟ: ਇੰਟਰਨਲ ਅਸੈੱਸਮੈਂਟ 25 ਅੰਕਾਂ ਦੀ ਹੈ, ਜੋ ਕਾਲਜ ਵੱਲੋਂ ਨਿਰਧਾਰਿਤ ਦਿਸ਼ਾ ਨਿਰਦੇਸ਼ਾਂ ਅਨੁਸਾਰ ਥਿਊਰੀ ਅੰਕਾਂ ਤੋਂ ਵੱਖਰੀ ਹੋਵੇਗੀ। ਇਸ ਪੇਪਰ ਦੇ ਕੁੱਲ ਅੰਕ 75+25 = 100 ਹਨ।

ਪਾਠ-ਕ੍ਰਮ
ਭਾਗ-ਪਹਿਲਾ
ਪੰਜਾਬੀ ਸ਼ਬਦ-ਬਣਤਰ: ਧਾਤੂ, ਵਧੇਤਰ (ਅਗੇਤਰ, ਮਧੇਤਰ, ਪਿਛੇਤਰ), ਪੰਜਾਬੀ ਕੋਸ਼ਗਤ ਸ਼ਬਦ ਅਤੇ ਵਿਆਕਰਨਕ ਸ਼ਬਦ

ਭਾਗ-ਦੂਜਾ
ਪੰਜਾਬੀ ਸ਼ਬਦ-ਪ੍ਰਕਾਰ:

(ੳ) ਸੰਯੁਕਤ ਸ਼ਬਦ, ਸਮਾਸੀ ਸ਼ਬਦ, ਦੋਜਾਤੀ ਸ਼ਬਦ, ਦੋਹਰੇ/ਦ੍ਹਰੁਕਤੀ ਸ਼ਬਦ ਅਤੇ ਮਿਸ਼ਰਤ ਸ਼ਬਦ

(ਅ) ਸਿਖਲਾਈ ਤੇ ਅਭਿਆਸ

ਭਾਗ-ਤੀਜਾ
ਪੰਜਾਬੀ ਸ਼ਬਦ-ਰਚਨਾ: ਇਕ-ਵਚਨ/ਬਹੁ-ਵਚਨ, ਲਿੰਗ-ਪੁਲਿੰਗ, ਬਹੁਅਰਥਕ ਸ਼ਬਦ, ਸਮਾਨਅਰਥਕ ਸ਼ਬਦ, ਬਹੁਤੇ ਸ਼ਬਦਾਂ ਲਈ ਇਕ ਸ਼ਬਦ, ਸ਼ਬਦ ਜੁੱਟ, ਵਿਰੋਧਅਰਥਕ ਸ਼ਬਦ, ਸਮਨਾਮੀ ਸ਼ਬਦ

ਭਾਗ-ਚੌਥਾ
ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ

ਖਾਣ-ਪੀਣ, ਸਾਕਾਦਾਰੀ, ਰੁੱਤਾਂ, ਮਹੀਨਿਆਂ, ਗਿਣਤੀ, ਮੌਸਮ, ਬਜ਼ਾਰ, ਵਪਾਰ, ਧੰਦਿਆਂ ਨਾਲ ਸੰਬੰਧਿਤ

PUNJAB HISTORY & CULTURE (C 321 TO 1000 A.D.)
(Special Paper in lieu of Punjabi compulsory)
(For those students who are not domicile of Punjab)
Course Code: BPHC-1204

Credit Hours (per week): 04
L- T- P
04-0-0
Time: 3 Hours
Total. Marks: 100
Theory: 75
Internal Assessment: 25

Instructions for the Paper Setters:
     Question paper should consist of two sections—Section A and Section B. The paper setter must ensure that questions in Section–A do not cover more than one point, and questions in Section–B should cover at least 50 per cent of the theme.

     Section–A: The examiner will set 15 objective type questions out of which the candidate shall attempt any 10 questions, each carrying 1½ marks. The total weightage of this section will be 15 marks. Answer to each question should be in approximately one to two sentences.

Section–B: The examiner will set 8 questions, two from each Unit. The candidate will attempt 4 questions selecting one from each Unit in about 1000 words. Each question will carry 15 marks. The total weightage of this section will be 60 marks
Note: **The examiner is to set the question paper in two languages: English & Hindi.**

     Course Objectives: The main objective of this course is to educate the students who are not domicile of the Punjab about the history and culture of the Ancient Punjab. It is to provide them knowledge about the social, economic, religious, cultural and political life of the people of the Punjab during the rule of various dynasties such as The Mauryans, The Khushans, The Guptas, The Vardhanas and other ancient ruling dynasties of the period under study.

Unit-I

1.   The Punjab under Chandragupta Maurya and Ashoka.

2.   The Kushans and their Contribution to the Punjab.

Unit-II

3.   The Punjab under the Gupta Emperors.

4.   The Punjab under the Vardhana Emperors

Unit-III

5.   Political Developments 7th Century to 1000 A.D.

6.   Socio-cultural History of Punjab from 7th Century to 1000 A.D.

Unit-IV

7.   Development of languages and Literature.

8.   Development of art & Architecture.

Suggested Readings:-

L. Joshi (ed.*), History and Culture of the Punjab*, Part-I, Patiala, 1989 (3rd edition).

L.M. Joshi and Fauja Singh (ed), *History of Punjab*, Vol.I, Patiala 1977.

Budha Parkash, *Glimpses of Ancient Punjab*, Patiala, 1983.

B.N. Sharma*, Life in Northern India*, Delhi. 1966.

Course Outcomes:

On completing the course, the students will be able to:

CO-1   Understand the history and culture of the Punjab in Ancient Period.
CO-2   Analyse social, economic, religious, cultural and political life of Ancient Indian dynasties.
CO-3   Study about the political developments from 7th century to 1000AD.
CO-4   Understand socio-cultural history of the Punjab from 7th century to 1000 AD.
CO-5   Analyse language, literature, art and architecture of Ancient Punjab.

B.Sc. (Information Technology) Semester – II

BIT-124P: Programming Lab- I (C++ Programming Language)
Skill Enhancement Course (SEC)

Total Marks: 100
Practical Marks: 75
Practical Internal Assessment M: 25

Credits		
L	**T**	**P**
0	0	4

Course Objectives:

1.	To understand how C++ improves C with object-oriented features.
2.	To learn how to write inline functions for efficiency and performance.
3.	To know the syntax and semantics of the C++ programming language.
4.	To learn how to design C++ classes for code reuse.
5.	To know how to implement copy constructors and class member functions.
6.	To understand the concept of data abstraction and encapsulation.
7.	To learn how to overload functions and operators in C++.
8.	To understand how containment and inheritance promote code reuse in C++.
9.	To learn how inheritance and virtual functions implement dynamic binding with polymorphism.
10.	To understand how to design and implement generic classes with C++ templates.
11.	To learn how to use exception handling in C++ programs.

Practical based on Programming in C++

Course Outcomes:

On completion of this course students will able to:

CO-1.	Use C++ more effectively.
CO-2.	Learn to think more analogously, creatively as well as comparatively.
CO-3.	Develop better software development skills in other language too.
CO-4.	Take review or tour of Programming in C and make aware of limitation of C, thereby understanding need of the origin of C++.
CO-5.	Raise programming level of students in C++to be able to apply in the real life.
CO-6.	Impart knowledge in such a way that students should be able to use of concept of Object-Oriented Programming approach in their programming skills.

CO-7.	Provide the knowledge of implementation of various features of C++i.e. concept of Object, Object communication, Encapsulation, Data hiding, overloading, etc.
CO-8.	Acquire in depth knowledge and develop software in C++.
CO-9.	Understand how to do programming in C++environment.
CO-10.	Understand and implement the concepts of object-oriented approach using C++.
CO-11.	Students will be able to identify different class attributes, member functions, base class and derived class and their relationships among them.
CO-12.	Learn how to reuse the code using polymorphism.
CO-13.	Students will be able to solve a real-life existing problem using the features of C++.
CO-14.	Develop software/big and complex programs for a complex problem.
CO-15.	Implement advance features of object-oriented approach in other various language(s).

Total Marks: 100
Practical Marks: 75
Practical Internal Assessment M: 25

Credits		
L	T	P
0	0	4

Course Objectives:

1.	To understand and implement various concepts of numerical and statistical methods to solve real life problems.
2.	To develop the mathematical skills of the students in the areas of numerical methods.
3.	To provide conceptual understanding of various numerical methods like solution of non-linear equations ,system of linear equations, interpolation, numerical integration with an aim of helping the students to understand the fundamentals, concepts and practical use of these methods in the field of computer sciences and applications.
4.	To provide understanding of statistical problems using different techniques.

Practical- Implementation of Numerical Methods and Statistical Techniques Using C++.
Course Outcomes:

On completion of this course students will able to:

CO-1.	Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions.
CO-2.	Apply various numerical methods to find solution of algebraic and transcendental non-linear equations and also solve system of linear equations numerically using direct and iterative methods.
CO-3.	Understand the methods to construct interpolating polynomials and finite difference concepts (forward, backward, and divided)for prediction and also find integration to find area under curve.
CO-4.	Learn fundamental concepts of statistical and optimization methods.
CO-5.	With reference to frequency distribution and measures of central tendency(like mean, median and mode), measures of dispersion(mean deviation ,standard deviation),Curve fit.

B.Sc. (Information Technology) Semester – II

Course Code: ZDA121

Course Title-DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION
DRUG ABUSE: MANAGEMENT AND PREVENTION
(Compulsory for all Under Graduate Classes)

Credit hrs/wk.: 2

Time: 3 Hours   Max. Marks: 50

Instructions for the Paper Setters:
1) There will be a total of 9 questions of which 5 are to be attempted.
2) Question 1 is compulsory and having 10 short answer type questions (1 mark each).
3) The remaining 8 questions (10 marks each) shall include 2 questions from each unit. Candidates shall be required to attempt 4 questions, one from each unit. Preferably, the question should not be split into more than two sub-parts.

Course Objectives:
   The course aim is to

CO-1.	Describe the role of family in the prevention of drug abuse.
CO-2.	Describe the role of school and teachers in the prevention of drug abuse.
CO-3.	Emphasize the role of media and educational and awareness program.
CO-4.	Provide knowhow about various legislation and Acts against drug abuse.

UNIT-I

- **Prevention of Drug abuse**

   Role of family: Parent child relationship, Family support, Supervision, Shaping values,

   Active Scrutiny.

UNIT-II

- School: Counseling, Teacher as role-model.

- Parent-teacher-Health Professional Coordination, Random testing on students.

UNIT-III

- **Controlling Drug Abuse**

   Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs,

   Publicity and media, Campaigns against drug abuse, Educational and awareness program

UNIT-IV

- Legislation: NDPS act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of

   Drugs, Strict enforcement of laws, Time bound trials.

References:

1. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
2. Gandotra, R. and Randhawa, J.K. 2018. voZrI d[otos'A (BPky'oh) gqpzXB ns o'eEkw. Kasturi Lal & Sons, Educational Publishers, Amritsar- Jalandhar.
3. Inciardi, J.A. 1981. The Drug Crime Connection. Beverly Hills: Sage Publications.
4. Modi, Ishwar and Modi, Shalini (1997) Drugs: Addiction and Prevention, Jaipur: Rawat Publication.
5. Randhawa, J.K. and Randhawa, Samreet 2018. Drug Abuse-Management and Prevention. Kasturi Lal & Sons, Educational Publishers, Amritsar- Jalandhar.
6. Sain, Bhim 1991, Drug Addiction Alcoholism, Smoking obscenity New Delhi: Mittal Publications.
7. Sandhu, Ranvinder Singh, 2009, Drug Addiction in Punjab: A Sociological Study. Amritsar: Guru Nanak Dev University.
8. Singh, C. P. 2000. Alcohol and Dependence among Industrial Workers: Delhi: Shipra.
9. World Drug Report 2011, United Nations office of Drug and Crime.
10. World Drug Report 2010, United Nations office of Drug and Crime

Course Outcomes:

The students will be able to:

CO-1.	Understand the importance of family and its role in drug abuse prevention.
CO-2.	Understand the role of support system especially in schools and inter-relationships between students, parents and teachers.
CO-3.	Understand impact of media on substance abuse prevention.
CO-4.	Understand the role of awareness drives, campaigns etc. in drug abuse management.
CO-5	Learn about the Legislations and Acts governing drug trafficking and Abuse in India.

B.Sc. (Information Technology)

Semester-III

S.N	Course Code	Course Name	Distribution of The Marks				Lectures Per week			Credit Distribution			Total Credit L+T+P	Page No.
			Theory	Internal Assessment	Practical	Total	L	T	P	L	T	P		
Discipline Specific Course(DSC)														
1	BIT-231	Introduction to Python	75	25	-	100	5	1	0	3	1	0	4	41-42
2	BIT-232	Data Structure	75	25	-	100	5	1	0	3	1	0	4	43-44
3	BIT-233	System Analysis & Design	75	25	-	100	5	1	0	3	1	0	4	45-47
Skill Enhancement Course(SEC)														
6	BIT-234P	Programming Lab- I (Python Programming Language)	-	13	37	50	0	0	6	0	0	2	2	51
7	BIT-235P	Programming Lab – II (Data Structure)	-	13	37	50	0	0	6	0	0	2	2	52
Value Added Course (VAC)														
8	ESL–221	Environment Studies – I (Compulsory)	-	-	-	50	3	0	0	2	0	0	2	48-50
												Total Credits=18		

B.Sc. (Information Technology) Semester – III

BIT-231: Introduction to Python

Time: 3 Hrs.   **Total Marks: 100**

Credits		
L	**T**	**P**
3	1	0

Theory Marks: 75

Theory Internal Assessment Marks:25

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 marks each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The students are required to attempt one question from each of these sections.**

Course Objectives:

1.	The main objective of this course is to help students to understand Python's basic constructs and assist them to acquire appropriate programming skills.
2.	To Learn core Python scripting elements such as variables and flow control structures.

UNIT-I
Introduction to Python: Process of Computational Problem Solving, Python Programming Language.
Data and Expressions: Literals, Variables and Identifiers, Operators, Expressions, Statements and Data Types.
Control Structures: Boolean Expressions (Conditions), Logical Operators, Selection Control, Nested conditions, Debugging.

UNIT-II
Lists: List Structures, Lists (Sequences) in Python, Iterating Over Lists (Sequences) in Python.
Iteration: While statement, Definite loops using For, Loop Patterns.
Functions: Fundamental Concepts, Program Routines, Flow of Execution, Parameters & Arguments, Recursive Functions, Recursive Problem Solving, Iteration vs. Recursion.

UNIT-III
Dictionaries: Dictionaries and Files, Looping and dictionaries, Advanced text parsing.
Files: Opening Files, Using Text Files.
String Processing: Accessing Values from Strings, Updating Strings, Strings Special Operators and Formatting Operators, Built-in String Methods.
Exception Handling: Standard Exceptions, Assertions in Python, Handling an Exception in Python, Clause with no exception, and Clause with multiple exceptions, try-finally Clause.

UNIT-IV

Objects and Their Use: Introduction to Object Oriented Programming.
Modular Design: Modules, Top-Down Design, Python Modules.
Using Databases and SQL: Database Concepts, SQLite Manager Firefox Add-on, SQL basic summary, Basic Data modeling, Programming with multiple tables**.**

References:

1. Python for Informatics, Charles Severance, version 0.0.7, 2009.
2. Introduction to Computer Science Using Python: A Computational Problem-Solving Focus, Charles Dierbach, Wiley Publications, 2012, ISBN: 978-0-470-91204-1.
3. Introduction To Computation And Programming Using Python, JOHN V GUTTAG, PHI, 2014, The MIT Press,ISBN-13: 978-8120348660.
4. Introduction to Computating & Problem Solving Through Python, Jeeva Jose and Sojan P. Lal, Khanna Publishers, 2015, ISBN-13: 978-9382609810.
5. Introduction to Computing and Programming in Python, Mark J. Guzdial, Pearson Education, 2015, ISBN-13: 978-9332556591.
6. Fundamentals of Python by Kenneth Lambert, Course Technology, Cengage Learning , 2015
7. Learning Python by Mark Lutz, 5th Edition, O'Reilly Media, 2013.

Course Outcomes:

After the completion of this course, the students will be able

CO-1.	To acquire knowledge of Python's basic concepts, such as, Literals, Variables and Identifiers, Operators, Expressions, Statements and Data Types, Control structures, and Iterations.
CO-2.	To understand the concepts of recursion, list, and functions.
CO-3.	Develop applications using object-oriented approach.
CO-4.	Implement real word applications using top-down approach.
CO-5.	Make database connectivity in Python programming language.
CO-6.	Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets.
CO-7.	Identify the commonly used operations involving file systems.

BIT-232: Data Structures

Time: 3 Hrs.   **Total Marks: 100**

Credits		
L	T	P
3	1	0

Theory Marks: 75

Theory Internal Assessment Marks:25

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 marks each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The students are required to attempt one question from each of these sections.**

Course Objectives:

1.	The main objective of this course is to help students to understand the concept of organizing and managing data in computer's memory.
2.	This course introduces different data structure techniques along with their representation in computer's memory.
3.	Students will Understand the importance of data structures in contest of writing efficient programs.

UNIT-I

Basic Data Structure: Introduction to elementary Data Organization, Common Operation on Data Structures, Algorithm: Definition, Complexity, Asymptotic Notations: Big O, Omega, Theta Notation, Time – Space tradeoff between Algorithms.

Arrays: Array Defined, Representing Arrays in Memory, Various Operations on Linear Arrays, Multidimensional Arrays.

Linked Lists: Introduction and Definition, Representing Linked Lists in Memory, Various Operations on Linked Lists, Types of Linked Lists, and Advantages of using Linked Lists over Arrays.

UNIT-II

Stacks: Description of STACK structure, Implementation of Stack using Arrays and Linked Lists, Applications of Stacks – Arithmetic expression: Types, Conversion from infix notation to Postfix and their subsequent evaluation, Recursion, etc.

Queues: Description of queue structure, Implementation of queue using arrays and linked lists, Description of priorities of queues, Dequeues.

UNIT-III

Trees: Description of Tree Structure and its Terminology, Binary Trees and Binary Search Trees and their representation in Memory

Graphs: Description of Graph Structure, Implement Graphs in Memory using Adjacency Matrix, Path Matrix,

Sorting and Searching: Sorting Algorithms, (Bubble Sort, Insertion Sort, Selection Sort, Merge Sort, Heap Sort) Searching Algorithms (Linear Search and Binary Search).

UNIT-IV

File Organization: Concept of field, record, file, blocking and compaction.

File Organization Techniques: Sequential, indexed, indexed sequential, Direct, Hashing. Concept of master and transaction files.

References:
1. Seymour Lipschutz, **Theory and Problems of Data Structures**, Schaum's Outline Series, McGraw Hill Company, 2017.
2. **Data Structures through C** by Yashwant Kanetkar, BPB Publications, 3rd edition, 2017.
3. **Data Structures through C++** by Yashwant Kanetkar, BPB Publications 4th edition, 2018.
4. **Data Structures and Algorithms Made Easy** by Narasimha Karumanchi 5th edition, 2016.

Course Outcomes:

After the course completion, the students will be able to	
CO-1.	Understand the concept of algorithm complexity and will acquire knowledge about mathematical notations which can be used to measure the algorithm's complexity.
CO-2.	Comprehend different data structure techniques, such as array, stacks, queue, linked list, trees, and graphs, along with the operations performed on them.
CO-3.	Understand the memory representation of the above-mentioned data structures.
CO-4.	Apply linear search and binary search techniques in real word applications to identify the particular element.
CO-5.	Get knowledge about different sorting algorithms along with their time complexities.
CO-6.	Understand the concept of files and Hashing.

BIT-233: System Analysis & Design

Time: 3 Hrs.   **Total Marks: 100**

	Credits	
L	**T**	**P**
3	**1**	**0**

Theory Marks: 75

Theory Internal Assessment Marks:25

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 marks each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The students are required to attempt one question from each of these sections.**

Course Objectives:

1.	Address different types of organizational needs which may undertake some information technology-based solution.
2.	Introduce the various aspects of feasibility and their use in the determination of project feasibility.
3.	Examine several development methodologies which may be used to manage the software development process.
4.	Examine a variety of information gathering techniques and their potential use.
5.	Briefly discuss security, validation, and privacy issues relating to data maintenance and accessibility.
6.	Address the objectives for effective design (input, output, database, data entry procedures).
7.	Discuss successful information system implementation by addressing training requirements and possibilities, physical conversion strategies, and the need for evaluation.

UNIT–I

Basic Concept of Systems
The System: Definition and Concepts; Elements of a System: Input, Output Processor, Control, Feedback, Environment, Boundaries and Interface; Characteristics of a System; Types of systems - Physical and Abstract System, Open and Closed Systems, Man-made Systems; Information and its categories.

Information System and System Analyst
Information systems: TPS, OAS, MIS, DSS, ESS; System Analyst: Role and need of system analyst, System Analyst as an agent of change.

UNIT-II

System Development Life Cycle

Introduction to SDLC, Various phases: study, analysis, design, development, testing, implementation, maintenance; System documentation: Types of documentation and their importance.

System Planning and Information Gathering

Initial Investigations, Identification of user needs, Project Identification and Selection; Needs of Information Gathering, Determination of requirements, Information gathering tools: interviews, group communication, questionnaires, presentations and site visits.

Feasibility Study

Definition, Importance of feasibility study, Types of feasibility study, System selection plan and proposal, Prototyping, Cost-Benefit Analysis: Tools and Techniques.

UNIT-III

Tools for System Analysis

Data Flow Diagram (DFD), Logical and Physical DFDs, Developing DFD; System Flowcharts and Structured charts, Structured English, Decision trees and Decision tables.

System Design

Module specifications, Module Coupling and cohesion, Top-down and bottom-up design; Logical and Physical design, structured design.

Input and Output

Input design: Input data, Input media and devices; Output design; Form Design: Classification of forms, Requirements of Form design.

UNIT-IV

System Implementation and Maintenance

Need of System Testing, Types of System Testing, Quality Assurance; System Conversion, Conversion methods, procedures and controls, System evaluation and performance, Maintenance activities and issues.

System Security and Audit

System Security, Security Threats, Risk Analysis, Control measures, System Audit, Disaster Recovery Planning.

References:
1. "Elements of System Analysis" – Marvin Gore and John W. Stubbe, 2003.
2. "System Analysis and Design" – Thapliyal M.P., 2002.
3. "Modern Systems Analysis & Design" – Hoffer, George and Valacich , 2001.
4. "SSAD: System Software Analysis and Design" – Mehta Subhash and Bangia Ramesh, 1998.
5. "Understanding Dynamic System: Approaches to Modelling, Analysis and Design" –Dorny C. Nelson,1993.
6. "System Analysis and Design" – Perry Edwards, 1993.
7. "Systems Analysis and Design" – Elias M. Awad, 1993.
8. "Analysis and Design of Information Systems" – James A. Senn, 1989.
9. "System Analysis and Design"- Alan Dennis, Barbara Haley Wixom And Roberta M. Roth, 5th Edition, 2012.
10. "System Analysis and Design"- Kenneth E. Kendall and Julie E Kendall, 10th Edition, 2019.

Course Outcomes:

CO-1.	Understand the types of organizational needs that can be addressed using information technology-based solutions.
CO-2.	Initiate, specify, and prioritize information systems projects by the determination of various aspects of feasibility for these projects.
CO-3.	Understand and compare different systems development methodologies.
CO-4.	Design high-level logical system characteristics (user interface design, design of data and information requirements).
CO-5.	Incorporate principles of security and user experience from the beginning of the systems development process.

B.Sc. (Information Technology)
SEMESTER–III
Course code: ESL–221
Course Title: ENVIRONMENTAL STUDIES–I (COMPULSORY)

Credit Hours (Per Week): 2
Total Hours: 30
Maximum Marks: 50

Instructions for Paper Setters: The question paper will consist of three sections. Candidate will be required to attempt all the sections. Each unit of the syllabus should be given equal weightage of marks. Paper to be set in English, Punjabi and Hindi.

Section–A: (16 Marks): It will consist of five short answer type questions. Candidates will be required to attempt four questions, each question carrying four marks. Answer to any of the questions should not exceed two pages.

Section–B: (24 Marks): It will consist of five questions. Candidates will be required to attempt four questions, each question carrying six marks. Answer to any of the questions should not exceed four pages.

Section–C: (10 Marks): It will consist of two questions. Candidate will be required to attempt one question (carrying ten marks) only. Answer to the question should not exceed 5 pages.

Course Objectives

CO-1	The main goal of Environmental studies is to create the environmental awareness to create a safe, green and sustainable environment.
CO-2	To make students aware about the importance of ecosystem, types of ecosystem, energy flow in an ecosystem, ecological succession, food chain and food web.
CO-3	To make students aware of water conservation, global warming, consumerism and waste products. and, also about the environmental protection acts.
CO-4	Role of National Service Scheme (NSS). Health and hygiene.

Unit-I

The Multidisciplinary Nature of Environmental Studies: Definition, components, scope and importance of environment/environmental studies, Need for public awareness.

Natural Resources: Definition, types, use, over exploitation, benefits, case studies (if any) and associated problems of following natural resources: Forest Resources, Water Resources, Mineral Resources, Food Resources, Energy Resources, Land Recourses *etc.*

Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

Unit-II

Ecosystem: General introduction, types (Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems *viz.* ponds, streams, lakes, rivers, oceans, estuaries), Structure and functions of an

ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids.

Unit-III

Social Issues and Environment: Sustainable development, Urban problems related to energy, Water conservation, rain water harvesting. Resettlement and rehabilitation of people: its problems and concerns. Case studies, Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and its cause. Case studies.Wasteland reclamation.

Environmental Protection Act: Air (prevention and Control of Pollution) Act.Water (prevention and Control of Pollution) Act. Wildlife Protection Act, Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness

Unit-IV

National Service Scheme

Introduction and Basic Concepts of NSS: History, philosophy, aims & objectives ofNSS; Emblem, flag, motto, song, badge *etc.;* Organizational structure, roles and responsibilities of various NSS functionaries.

Health, Hygiene & Sanitation: Definition, needs and scope of health education; Food and Nutrition; Safe drinking water, water borne diseases and sanitation (Swachh Bharat Abhiyan); National Health Programme; Reproductive health.

Suggested Books:

1. Agarwal, K. C. 2001. Environmental Biology, Nidhi Publications Ltd. Bikaner.

2. Bharucha, E. 2013 . Textbook of Environmental Studies, Universities Press, Hyderabad.

3. Basu, M., Xavier, S. 2016. Fundamentals of Environmental Studies, Cambridge University Press, India

3. Down to Earth, Centre for Science and Environment, New Delhi.

4. Jadhav, H. and Bhosale, V. M. 1995. Environmental Protection and Laws. Himalaya Pub.

5. Joseph, K. and Nagendran, R. 2004. Essentials of Environmental Studies, Pearson

   Education (Singapore) Pvt. Ltd., Delhi.

6. Kaushik, A. and Kaushik, C. P. 2004. Perspective in Environmental Studies, New Age

   International (P) Ltd, New Delhi.

7. Mahapatra, R., Jeevan, S.S. and Das, S. 2017. Environment Reader for Universities, Centre for Science and Environment, New Delhi.

8. Miller, T. G. Jr. 2000. Environmental Science, Wadsworth Publishing Co.

9. Raven, P.H., Hassenzahl, D.M. and Berg, L.R. 2012. Environment. 8th edition. John Wiley & Sons.

10. Sharma, P. D. 2005. Ecology and Environment, Rastogi Publications, Meerut.

11. Booklet on Safe Driving. Sukhmani Society (Suvidha Centre), District Court Complex,

    Amritsar

12. Kanta, S., 2012. Essentials of Environmental Studies, ABS Publications, Jalandhar.

13. Saroj A., Kaur R., Walia H., Kaur T, 2021. Environmental Studies - A Holistic Approach, KLS Publishers.

Suggested Websites:

1. https://nss.gov.in
2. https://moef.gov.in
3. http://punenvis.nic.in
4. https://www.unep.org

Course Outcomes:

CO-1	To learn about the sustainable environment.
CO-2	To gain the knowledge ecosystem and its functioning.
CO-3	To know about the water conservation programs like rain water harvesting and water shedding and to gain knowledge of environmental (air, water and pollution) protections acts.
CO-4	To know about the role and importance of NSS– a volunteer organization, in making up a better environment and to maintain better health and hygiene.

B.Sc. (Information Technology) Semester – III

BIT-234P (Programming Lab-I)

Time: 3 Hrs.

Total Marks: 50

Practical Marks: 37

Credits		
L	T	P
0	0	2

Practical Internal Assessment Marks:13

Course Objectives:

1.	To acquire programming skills in core Python.
2.	To acquire Object Oriented Skills in Python.
3.	To define the structure and components of a Python program.
4.	To learn how to read and write files in Python.
5.	To develop the ability to write database applications in Python.
6.	Implement Conditionals and Loops for Python Programs.
7.	Use functions and represent Compound data using Lists, Tuples and Dictionaries

Programs:
1) Program demonstrating Input / Output in Python.
2) Python code to describe different operators.
3) Counters in Python (Initialization and Updation).
4) Regular Expressions in Python (Search, Match and Find All).
5) Basic Slicing and Advanced Indexing in NumPy Python.
6) Creating a Pandas DataFrame.

Lab – I: Based on Python, Programming Language

Course Outcomes:

CO-1.	Read, write, and execute simple Python programs.
CO-2.	Write simple Python programs for solving problems.
CO-3.	Decompose a Python program into functions, lists etc.
CO-4.	Read and write data from/to files in Python Programs.
CO-5.	Underline the use of package.

B.Sc. (Information Technology) Semester – III

BIT-235P
Programming Lab-II (Data Structures)

Time: 3 Hrs.   **Total Marks: 50**

Credits		
L	**T**	**P**
0	**0**	**2**

Practical Marks: 37

Practical Internal Assessment Marks:13

Course Objectives:

1.	The main objective of this practical lab is to make the students to be able to implement the programs utilizing different data structure techniques to organize and manage data in computer's memory.
2.	The students will gain an understanding of different approaches available for searching and sorting the data and further be able to identify the methods requiring minimum time to perform the pre-mentioned tasks.

Lab II: Based on Data Structures
Course Outcomes:

After the completion of this course, students will be able

CO-1	To implement the real-world applications by making use of linear data structure, such as, arrays, stacks, queues, linked lists, trees and graphs, to handle the data stored in computer's memory.
CO-2	To perform the implementation using non-linear data structure, such as, trees and graphs.
CO-3	To perform traversing, insertion, and deletion operations on the above-mentioned data structures.
CO-4	To perform the search operations by making use of suitable search technique.
CO-5	To sort the data by using different sorting techniques and can also assess the time requirement of the available sorting techniques.

B.Sc. (Information Technology)

Semester-IV

S.N	Course Code	Course Name	Distribution of The Marks				Lectures Per week			Credit Distribution			Total Credit L+T+P	Page No.
			Theory	Internal Assessment	Practical	Total	L	T	P	L	T	P		
Discipline Specific Course(DSC)														
1	**BIT-241**	**Database Management System**	75	25	-	100	5	1	0	3	1	0	4	54-55
2	**BIT-242**	**Computer Architecture**	75	25	-	100	5	1	0	3	1	0	4	56-57
3	**BIT-243**	**Java Programming**	75	25	-	100	5	1	0	3	1	0	4	58-59
4	**BIT-244**	**Compiler Design**	75	25	-	100	5	1	0	3	1	0	4	60-61
Skill Enhancement Course(SEC)														
6	**BIT-245P**	**Programming Lab – I (Oracle)**	-	13	37	50	0	0	6	0	0	2	2	65
7	**BIT-246P**	**Programming Lab – II (Java)**	-	13	37	50	0	0	6	0	0	2	2	66
Value Added Course (VAC)														
8	**ESL–222**	**Environment Studies – II (Compulsory)**	-	-	-	50	2	0	0	2	0	0	2	62-64
										Total Credits=22				

Note:
1. All the students are required to undergo 'Industrial Training' for 6 weeks in IT Companies after 4th semester final examinations. Final degree to the students will be awarded subject to their successfully completing the 'Industrial Training'.
2. 'Industrial Training' will be evaluated as satisfactory / unsatisfactory internally by the department.
3. Last date for submission of training certificate is within 1 Week after coming from training.

4. Marks of Paper EVS will not be included in Grand Total.

B.Sc. Information Technology) Semester – IV

BIT-241: Database Management System

Time: 3 Hrs.   Total Marks: 100

Theory Marks: 75

Credits		
L	T	P
3	1	0

Theory Internal Assessment Marks:25

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 marks each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The students are required to attempt one question from each of these sections.**

Course Objectives:

1.	To provide a sound introduction to the discipline of database management as a subject in its own right, rather than as a compendium of techniques and product-specific tools.
2.	To familiarize the participant with the nuances of database environments towards an information-oriented data-processing oriented framework.

UNIT-I

Introduction to data, field, record, file, database, database management system. Structure of database system, Advantage and disadvantage, levels of database system, Relational model, hierarchical model, network model, comparison of these models, E–R diagram, different keys used in a relational system, SQL. DBA, responsibilities of DBA.

UNIT-II

Relational form like INF, 2NF, 3NF, BCNF, 4th NF, 5th NF, DBTG, concurrency control and its management, protection, security, recovery of database.

UNIT-III

SQL: Introduction to SQL–DDL, DML, DCL, Join methods & sub query, Union Intersection, Minus, Tree Walking, Built in Functions, Views, Security amongst users, Sequences, Indexing Cursors–Implicit & Explicit, Procedures, Functions & Packages Database Triggers.

UNIT-IV

Big Data: Introduction to Big Data and Analytics, Introduction to NoSQL.
Introductory knowledge and classification of NoSQL databases based upon Column (HBase), Document (MongoDB), Keyvalue (Oracle NoSQL database), Graph, Multimodel and their query languages.

References:

1. Introduction to Database System by C.J. Date.
2. Database Management System by B.C. Desai.
3. Database Concept by Korth.
4. Simplified Approach to DBMS– Kalyani Publishers
5. Oracle – Developer – 2000 by Ivan Bayross.
6. Database System concepts & Oracle (SQL/PLSQ) – AP Publishers.
7. https://www.mongodb.com/nosql-explained.
8. Introduction to NoSQL (Ebook), NoSQL Seminar 2012 @ TUT, Arto Salminen.

Course Outcomes:

CO-1.	Describe the fundamental elements of relational database management systems.
CO-2.	Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
CO-3.	Design ER-models to represent simple database application scenarios.
CO-4.	Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data.
CO-5.	Improve the database design by normalization.

B.Sc. (Information Technology) Semester – IV

BIT-242: Computer Architecture

Time: 3 Hrs. **Total Marks: 100**

Credits		
L	T	P
3	1	0

Theory Marks: 75

Theory Internal Assessment Marks:25

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 marks each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The students are required to attempt one question from each of these sections.**

Course Objectives

1.	Conceptualize the basics of organizational and architectural issues of a digital computer.
2.	Analyze processor performance improvement using instruction level parallelism.
3.	Study various data transfer techniques in digital computer.
4.	Articulate design issues in the development of processor or other components that satisfy design requirements and objectives.
5.	You will learn case study of VAX 11/780.
6.	Understand and be able to explain bus transactions, memory organization and address decoding, basic I/O interfaces

UNIT-I

Information Representation: Register Transfer Language, Various Registers, Implementing Common Bus using 16- bit and also using Multiplexers, Logical, Arithmetic & Shift Micro – operations.

Basic Computer Design: Instruction Codes, Interfacing various Registers, Computer Instructions, Timing and control, Memory reference instruction Instruction Cycle, Interrupt cycle, Design of a Basic Computer.

UNIT-II

CPU Design: General register organization, Stack Organized CPU, Instruction Formats, Addressing Modes, RISC, CISC, Program Control, Hardwired & Micro-programmed Control Unit.

UNIT-III

Memory Organization: Memory Hierarchy, Designs & Concepts of Main Memory, Auxiliary Memory, Cache and Virtual Memory.

I/O Organization: I/O Interface, Modes of Transfer, DMA–DMA Transfer and DMA Controller & I/O Processor.

UNIT-IV

Pipeline & Vector Processing: Parallel Processing, Pipelining-Arithmetic pipelining and Instruction Pipelining, Parallel & Distributed Computers, SISD, SIMD & MISD, MIMD Machines, Vector Processing.
Case study of VAX 11/780.

References:
1. Computer System Architecture by M. Morris Mano, Third Edition, Pearson Education Inc., 1992
2. Computer Architecture: A Quantitative Approach by John L. Hennessy and David A.Patterson, Fifth Edition, Morgan Kaufmann Publishers, 2012
3. Computer Organization & Architecture - Designing for Performance by WilliamStallings, Eighth Edition, Pearson, 2010.
4. Computer Architecture and Organization: John .P. Hayes, McGraw Hill, 1998
5. Computer Systems Design and Architecture "by Vincent P Heuring and Harry F Jordan second edition, 2003.

Course Outcomes

Students will able to:

CO-1.	Describe basic organization of computer.
CO-2.	Demonstrate control unit operations and conceptualize instruction level parallelism.
CO-3.	Demonstrate and perform computer arithmetic operations.
CO-4.	Categorize memory organization and explain the function of each element of a memory hierarchy.
CO-5.	Identify and compare different methods for computer I/O mechanisms.

BIT-243: Java Programming

Time: 3 Hrs.   **Total Marks: 100**

Credits		
L	T	P
3	1	0

Theory Marks: 75

Theory Internal Assessment Marks: 25

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 marks each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The students are required to attempt one question from each of these sections.**

Course Objectives:
Student should be able

1.	To understand object-oriented programming concepts and apply them in solving problems.
2.	To introduce the principals of inheritance and polymorphism and demonstrate how they relate to design of abstract class.
3.	To introduce the implementation of packages and interfaces.
4.	To introduce the concept of exception handling and multithreading.
5.	To be proficient in Applet Programming
6.	To do programming in Visual Studio Code editor

UNIT-I

Introduction to Concepts of Programming: Introduction to Java, JVM, Features of java, JDK Environment & tools like (java, javac, applet viewer, javadoc, jdb)

Preparing and Running a Java Program: Installation of Java, Structure of a Java Program

The Java Environment: Introduction to visual studio code, Setting up VS Code for Java Development, Installing Extensions, Installing and setting up a Java Development Kit (JDK),Compilation and Execution of Java Program in it, Debugging of Java Program.

UNIT-II

Basic Language Elements: Data types, Variables, Operators, Keywords, Naming Convention, Decision Making (if, switch), Looping (for, while), Type Casting.

Classes and Objects: Creating Classes and objects, Memory allocation for objects, Constructor, Implementation of Inheritance (Simple, Multilevel, Hierarchical), Implementation of Polymorphism (Method Overloading, Method Overriding), Nested and Inner classes.

Arrays String and Vector: Arrays, Creating an array, Types of Array (One Dimensional arrays, Two Dimensional array), Strings, String – Arrays, String Methods, String Buffer class, Vectors, Wrapper classes.

UNIT-III

Abstract Class: Interface and Packages, Modifiers and Access Control (Default, public private protected), Abstract classes and methods

Interfaces and Packages: (Packages Concept, Creating user defined packages, Java Built in packages, Java.lang->math, Java.util->Random, Date, and Hash Table)

Multithreading: Creating Threads using Different methods, Thread Priorities, Thread Synchronization, Inter process thread Communication.

UNIT-IV

Exception Handling: Exception types, Using try catch and Multiple catch, Nested try, throw, throws and finally, Creating User defined Exceptions

Applet Programming: Introduction, Types of applet, Applet Life cycle, Creating applet, Applet tag

References:

1. "Java–The Complete Reference", Herbert Schildt, Tata MacGraw Hill, Eleventh Edition.
2. "Introduction to Java Programming", Y. Daniel Liang, Pearsons Publications, Eleventh Edition.
3. Programming with JAVA - E Balgurusamy A Primer, TMH, 1999, Sixth Edition.
4. JAVA: How to Program- Paul Deital and Harvey Deital, Pearson Prentice Hall, 2010.

Course Outcomes:

Students will be able to

CO-1.	Understand the concept of OOPs as well as the purpose and uses principal of inheritance, polymorphism in encapsulation and method overloading.
CO-2.	Identify classes, objects, members of a class and the relationship among them which is needed for a specific problem.
CO-3.	Create a java applications and programs using sound oops practices
CO-4.	Develop programs using the java collection API as well as the java standard class library.
CO-5.	Develop and understand exception handling.
CO-6.	Create web pages using Applet Programming
CO-7.	To do programming in Visual code Editor.

B.Sc. (Information Technology) Semester – IV

BIT-244: Compiler Design

Time: 3 Hrs.   **Total Marks: 100**

Credits		
L	**T**	**P**
3	**1**	**0**

Theory Marks: 75

Theory Internal Assessment Marks:25

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 marks each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The students are required to attempt one question from each of these sections.**

Course Objectives:

1.	To learn the process of translating a high-level language program to executable code.
2.	To understand the fundamental principles in compiler design and to identify the relationships among different phases of compiler.
3.	To provide a thorough understanding of the internals of Compiler Design
4.	To apply the optimization techniques to have a better code for code generation

UNIT-I

Basics of Compilers and different phases of compiler design.
Lexical Analysis: Tokens, input buffering, Regular Expressions, Regular Expressions to Automata, LEX, LEX features and specification.
Syntax Analysis: Context-free grammars, top-down and bottom-up parsers, Recursive Descent Parser, Predictive parser, Shift Reduce Parser, LALR parsers, Error detection and recovery, YACC.

UNIT-II

Semantic analysis: Introduction to Semantic analysis, Need of semantic analysis, type checking and type conversion.
Symbol Table Handling: Symbol table contents, operations on Symbol Tables, Organizations of Symbol Tables.
Intermediate Code Generation Three address Code (Triples, Quadruples).

UNIT-III

Run-time Storage Management: Stack Allocation Space, Activation Record, static and control links, parameter passing, return value, passing array and variable number of arguments, Static and Dynamic scope, Dangling Pointers, Heap Management

Code Generation: Issues in code generation, basic blocks, flow graphs, DAG representation of basic blocks, Target machine description, Register allocation and Assignment, Simple code generator, Code generation of simple programming constructs

UNIT-IV

Code Optimization: local, global and loop optimization, Optimizing transformations, compile time evaluation, common sub-expression elimination, variable propagation, code movement, strength reduction, dead code elimination; DAG based local optimization, Introduction to global data flow analysis

Types of Compiler: Incremental compilers and Cross Compilers

References:

1. Compilers Principles, Techniques and Tools, Second Edition, Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman., Pearson. 2013
2. Tremblay J.P., Sorenson P.G., The Theory and Practice of Compiler Writing, Mc–Graw Hill, 2007.
3. Compiler Design, K. Muneeswaran., Oxford University Press, 2012
4. S.Malathi, K.Kiruthika, C. Jackulin, Compiler Design, Ane Books Pvt. Ltd., 2015

Course Outcomes:

At the end of this course student will be able to:

CO-1.	Study the lexical, syntactic and semantic structures of high-level language codes.
CO-2.	Understand the applications of Regular Expressions, finite state machines and context free grammars in design of compilers.
CO-3.	Know about the importance of code optimization.
CO-4.	Understand the target machine's run time environment, its instruction set for code generation and techniques used for code optimization.
CO-5.	Understand memory management both in the compiler and in the generated code.

Credit Hours (Per Week): 2
Total Hours: 30
Maximum Marks: 50

Instructions for Paper Setters: The question paper will consist of three sections. Candidate will be required to attempt all the sections. Each unit of the syllabus should be given equal weightage of marks. Paper to be set in English, Punjabi and Hindi.

Section–A: (16 Marks): It will consist of five short answer type questions. Candidates will be required to attempt four questions, each question carrying four marks. Answer to any of the questions should not exceed two pages.

Section–B: (24 Marks): It will consist of five questions. Candidates will be required to attempt four questions, each question carrying six marks. Answer to any of the questions should not exceed four pages.

Section–C: (10 Marks): It will consist of two questions. Candidate will be required to attempt one question (carrying ten marks) only. Answer to the question should not exceed 5 pages.

Course Objectives

CO-1	To study the concept of Biodiversity – role, importance, values and its conservation. Hot spots and threats to biodiversity.
CO-2	To create awareness regarding environmental pollution, its causes and effects and preventive measure to control the different types of pollution.
CO-3	To make students aware of growing human population – causes and concern. Family welfare programs. Road safety (Traffic) rules.
CO-4	To know about entrepreneurship development and civil/self defense.

Unit-I

Biodiversity and its Conservation:

- Definition: Genetic, species and ecosystem diversity.
- Biogeographical classification of India.
- Value of Biodiversity: Consumptive use; productive use, social, ethical, aesthetic and optionvalues.
- Biodiversity of global, National and local levels.
- India as mega-diversity nation.
- Hot-spots of biodiversity.
- Threats to Biodiversity: Habitat loss, poaching of wild life, man wildlife conflicts. Threatened and endemic species of India.
- Endangered species, vulnerable species, and rare species.
- Conservation of Biodiversity: In situ and Ex-situ conservation of biodiversity. National Parks, Wild life sanctuaries, Biosphere reserve, Project Tiger, Project Elephant.

Environmental Pollution:

Environmental Pollution: Concepts and Types

- ➢ Definition, causes, effects and control measures of:
    a) Air Pollution

    b) Water Pollution

    c) Soil Pollution

    d) Marine Pollution

    e) Noise Pollution

    f) Thermal Pollution

    g) Nuclear Hazards

    h) Electronic Waste

- ➢ Concepts of hazards waste & human health risks.
- ➢ Solid Waste Management: Causes, effects and control measures of municipal, biomedical and e-waste
- ➢ Role of an individual in prevention of pollution.
- ➢ Pollution case studies.
- ➢ Disaster Management: Floods, Earthquake, Cyclone and Landslides.

Unit-III

Human Population and the Environment

- ➢ Human population growth: impacts on environment.
- ➢ Population explosion-Family welfare programme.
- ➢ Environment and human health: Concept of health and disease, common communicable and non communicable diseases, public awareness
- ➢ Human rights.
- ➢ Value education.
- ➢ Women and child welfare.
- ➢ Role of information technology in environment and human health.
- ➢ Environment movments in India: Chipko movement, Silent valley movement and other case studies.
- ➢ Road Safety Rules & Regulations**:** Use of Safety Devices while Driving, Do's and Don'tswhile Driving, Role of Citizens or Public Participation, Responsibilities of Public underMotor Vehicle Act, 1988, General Traffic Signs.
- ➢ Accident & First Aid**:** First Aid to Road Accident Victims, Calling Patrolling Police &Ambulance.

Unit-IV

National Service Scheme:

- **Entrepreneurship Development:** Definition & Meaning; Qualities of good entrepreneur; Steps/ ways in opening an enterprise; Role of financial and support service Institutions.
- **Civil/Self Defense:** Civil defense services, aims and objectives of civil defense; Needs for self-defense training.

Field Visits:

- Visit to a local area to document environmental assets–river/forest/grassland/ hill/mountain.
- Visit to a local polluted site–Urban/Rural/Industrial/Agricultural.
- Study of common plants, insects, birds.
- Study of simple ecosystems–pond, river, hill slopes etc.
- Contribution of the student to NSS/any other social cause for service of society.
- Visit to Museum/Science City
- Municipal solid waste management and handling.

Note: In this section the students will be required to visit and write on the environment of an area/ ecosystem/vi1lage industry/disaster/mine/dam/agriculture field/waste management/ hospital etc. with its salient features, limitations, their implications and suggestion for improvement.

References/Books:

1. Agarwal, K. C. 2001. Environmental Biology, Nidhi Publications Ltd. Bikaner.
2. Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press, Hyderabad.
3. Down to Earth, Centre for Science and Environment, New Delhi.
4. Jadhav, H. & Bhosale, V. M. 1995. Environmental Protection and Laws. Himalaya Pub.
5. Joseph, K. and Nagendran, R. 2004. Essentials of Environmental Studies, PearsonEducation (Singapore) Pte. Ltd., Delhi.
6. Kaushik, A. & Kaushik, C. P. 2004. Perspective in Environmental Studies,New Age International (P) Ltd, New Delhi.
7. Miller, T. G. Jr. 2000. Environmental Science, Wadsworth Publishing Co.
8. Sharma, P. D. 2005. Ecology and Environment, Rastogi Publications, Meerut.
9. Booklet on Safe Driving. Sukhmani Society (Suvidha Centre), District Court Complex,Amritsar
10. Asthana, D.K. 2006. Text Book of Environmental Studies, S. Chand Publishing.
11. Kanta, S., 2012. Essentials of Environmental Studies, ABS Publications, Jalandhar.
12. Basu, M., Xavier, S. 2016. Fundamentals of Environmental Studies, Cambridge University Press, India.
13. Mahapatra, R., Jeevan, SS, Das S. 2017. Environment Reader for Universities, Centre for Science and Environment, New Delhi.

Course Outcomes:

CO-1	To know about the meaning of Biodiversity and its role in environment.
CO-2	To know about the causes of different forms of pollution and their control measures.
CO-3	To know about the causes and challenges of growing human population. Women and child welfare programs.
CO-4	To know the development of entrepreneurship and techniques of civil/self defense.

BIT-245P
Programming Lab-I (Oracle)

Time: 3 Hrs.

Total Marks: 50

Credits		
L	T	P
0	0	2

Practical Marks: 37

Practical Internal Assessment Marks:13

Course Objectives:

1.	To get acquaint students with the basics of DBMS, different Architectural Models for DBMS, Normalization of data, Concurrency control problems and its management, Protection, Security and recovery aspects of databases along with practical knowledge of databases using SQL and PL/SQL.
2.	The key goal is to prepare students for a professional career in the field of data Administration and database design.
3.	To get acquaint students with basics of database security and administration.
4.	To get acquaint students with good knowledge of DBMS. During the course, students will learn about database design and database handling activities.
5.	This course provides practical knowledge to understand advanced database concept such as Big Data Analysis.

Lab – I: Oracle

Course Outcomes:

CO-1.	Knowledge and understanding: Databases and their design & development.
CO-2.	Intellectual Cognitive/ analytical skills: Normalization of Databases.
CO-3.	Practical Skills: Using SQL and PL/SQL.
CO-4.	Transferable skills: Usage of DBMS design and administration.
CO-5	Construct database models for different database applications.
CO-6	Understand Big Data and its analytics in the real world

B.Sc. (Information Technology) Semester – IV

BIT-246P
Programming Lab-II (JAVA)

Time: 3 Hrs.

Total Marks: 50

Credits		
L	T	P
0	0	2

Practical Marks: 37

Practical Internal Assessment Marks:13

Course Objectives:

1.	Java is the most prevalent programming language in the software industries for implementing the software systems.
2.	The main focus of this practical lab is to make the students proficient in developing the software systems by using Java programming language by teaching them the basic concepts and notions of JAVA.
3.	Students should be able to do programming using Visual Code Editor

Lab – II: Java

Course Outcomes: After completion of this course, the students will be able to

CO-1.	Apply the basic constructs for developing java programs.
CO-2.	Construct the applications incorporating inheritance and polymorphism features.
CO-3.	Implement inter-process communication by utilizing the concept of threads.
CO-4.	Develop applications capable of handling exceptions.
CO-5.	Develop Web pages using Applets.

B.Sc. (Information Technology)

Semester-V

S.N	Course Code	Course Name	Distribution of The Marks				Lectures Per week			Credit Distribution			Total Credit L+T+P	Page No.
			Theory	Internal Assessment	Practical	Total	L	T	P	L	T	P		
Discipline Specific Course(DSC)														
1	BIT-351	Computer Networks	75	25	-	100	5	1	0	3	1	0	4	68-69
2	BIT-352	Operating System	75	25	-	100	5	1	0	3	1	0	4	70-71
3	BIT-353	Web Development using PHP	75	25	-	100	5	1	0	3	1	0	4	72-73
Skill Enhancement Course(SEC)														
6	BIT-354P	Lab – I Computer Networks and Operating System	-	13	37	50	0	0	6	0	0	2	2	74
7	BIT-355P	Lab – II PHP	-	13	37	50	0	0	6	0	0	2	2	75
												Total Credits=16		

B.Sc. (Information Technology) Semester – V

BIT-351: Computer Networks

Time: 3 Hrs.   **Total Marks: 100**

Credits		
L	T	P
3	1	0

Theory Marks: 75

Theory Internal Assessment Marks:25

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 marks each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The students are required to attempt one question from each of these sections.**

Course Objective:

1.	Describe how computer networks are organized with the concept of layered approach.
2.	Implement a simple LAN with hubs, bridges and switches.
3.	Describe how packets in the Internet are delivered.

UNIT – I

Basic concepts of Computer
Networks, Client Server Network topologies. OSI Reference Model, TCP/IP Model Comparison and Critiques, Concepts of Routers, bridges, Repeaters, Gateways.

Data Transmission: Analog & Digital Transmission, Modem, Codec, Pulse Code Modulation Multiplexing, Circuit Switching, Packet Switching, message Switching, Hybrid Switching.

UNIT-II

The Application Layer: - Domain name system, electronic mail, World Wide Web: architectural Overview, dynamic web document and http. Application Layer Protocols: Simple Network Management Protocol, File Transfer Protocol, Simple Mail Transfer Protocol, Telnet.

Transmission Media: – Twisted Pair, Co–axial Cable, Baseband, Broadband, Fibre optics, Satellite, Wireless Transmission, Telephone System.

UNIT-III

The Data link Layer: - Design Issues, Error Detection and Correction, Data Link Sliding Window

Protocols.

The Network Layer: - Network layer design issues, routing algorithms, Congestion control Algorithms, Internetworking, the network layer in the internet (IPv4 and IPv6), Quality of Service.

UNIT-IV

The Transport Layer:- Transport service, elements of transport protocol, Simple Transport Protocol, Internet transport layer protocols: UDP and TCP.

IEEE Standard 802 for LAN's and MAN's Routing Algorithm, Internetworking, Network Security.

References:

1. Tanenbaum A.S. 'Computer Network', PHI. 4th Edition.
2. Stallings W., 'Data and Computer Communications', PHI. 8th Edition.
3. Data Communication and Networking by Behrouz A Forouzan. 5th Edition.
4. Kurose, Computer Networking , Pearson publication, Eight Edition.

Course Outcome: On completion of this course students will able to:

CO-1.	Understand the concepts of data communication and networks, TCP/IP and OSI reference models.
CO-2.	Discuss the process of Multiplexing, switching and transmission media in networks.
CO-3.	Learn the services of data link layer, network layer, transport layer and their protocols.
CO-4.	Understand multiple access protocols and Ethernet
CO-5.	Know about the services of network layer, transport layer and application layer.

BIT-352: Operating System

Time: 3 Hrs.   **Total Marks: 100**

Credits		
L	T	P
3	1	0

Theory Marks: 75

Theory Internal Assessment Marks:25

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 marks each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The studentsare required to attempt one question from each of these sections.**

Course Objectives:

1.	To understand what a process is and how processes are synchronized and scheduled.
2.	To understand the services provided by and the design of an operating system.
3.	To understand the structure and organization of the file system.
4.	To understand different approaches to memory management.
5.	Students should be able to use system calls for managing processes, memory and the file system.
6.	To study UNIX architecture.
7.	To study UNIX file study.
8.	To execute different UNIX commands.

UNIT – I

Introduction: Definition, Need of Operating System, Functions of Operating System, Early Systems, Evolution of Operating Systems, Single User Operating System and Multiuser Operating System, Multiprogramming, Difference between Multiprogramming, multitasking, multithreading and multiprocessing, Simple Batch system, Multi programmed Batch. Time Sharing Systems, spooling, Personal Computer System, Parallel Systems, Distributed Systems, Real–time Operating Systems. Types of Real–time Operating Systems, Factors for selecting an RTOS, Applications of Real Time Operating System.

Processes: Process concepts, Process states, Process control block, Process Scheduling, operation on processes, Cooperating processes, Threads.

UNIT-II

CPU–Scheduling: Basic concepts, CPU-I/O burst cycle, Preemptive scheduling, Dispatcher, scheduling criteria, scheduling algorithms (FCFS, SJF, Priority, RR), algorithm evaluation.
Deadlocks: Definition, Necessary condition for deadlock, Deadlock Prevention Mutual exclusion, Hold and wait, No pre–emption, circular wait Bankers algorithms, Recovery from deadlock, semaphores.

UNIT – III

Memory Management: Concept of Relocation, Swapping, backing storage, swap time, MFT, MFT job scheduling, region size selection, memory fragmentation, MVT, MVT job scheduling compaction, paging, segmentation.
Virtual Memory: Overlays, demand paging, page fault, performance of demand paging, page replacement, page replacement algorithm, FIFO, Optimal page replacement, Thrashing.
Device Management: I/O and device management physical characteristics, FCFS, SSTF, SCAN, CSCAN.

UNIT-IV

File Management: Disk and File Management.

Course Outcomes:
At the end of this course the student shall be able to

1.	Learn about operating systems, functions of operating systems, system calls.
2.	Learn about process coordination and process scheduling algorithms.
3.	Learn about memory management, critical section and deadlock handling algorithms.
4.	Learn about file management and disk scheduling algorithms.
5.	Able to implement various algorithms required for management, scheduling, allocation and communication used in Operating System.
6.	Describe and analyze the memory management and its allocation policies.

References:

1. "Operating System Concepts", Fourth Edition by Silberschatz Galvin Addison Wesley, 1996.
2. "Operating Systems: A Design Oriented Approach" by Crowley, Published by Tata McGraw Hill, 2001.
3. "Operating Systems" Second Edition by Dietel, Addison Wesley, 2017.
4. Madnick & Donovan: Operating System, McGraw Hill, 1978.
5. A.C. Shaw: Logic Design of Operating Sytem, Prentice Hall, 1988.
6. The Design of the UNIX Operating System by Maurice J. Bach, Pearson publication, 1986.

BIT-353: Web Development using PHP

Time: 3 Hrs.   **Total Marks: 100**

Credits		
L	T	P
3	1	0

Theory Marks: 75

Theory Internal Assessment Marks:25

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 marks each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The studentsare required to attempt one question from each of these sections.**

Course Objectives:

1.	The major objective of this course is to provide conceptual and practical exposure to field of web development and designing using PHP and MySQL.
2.	Students can enhance and upgrade their skills of programming though learning PHP practically. Students will implement the theoretical concepts of database learnt in lower classes using MySQL database.
3.	It will provide students knowledge to design and develop dynamic database- driven web applications using PHP.
4.	The course provides complete understanding to how to connect to any database to create HTML forms and reports etc.
5.	Many leading websites and projects are based on PHP and MySQL. So, it provides opportunity for the students to get placed in IT companies.

UNIT-I
Introduction to PHP: Introduction to PHP, History & Future Scope of PHP, Benefit & Importance of PHP, Client-side vs. Server-side scripting, Installation of tools for working in PHP like XAMPP, WAMP for PHP, Apache & MySQL.

Introduction to Language constructs: PHP Syntax, user-defined and pre-defined variables, constants, PHP's inbuilt data types, Keywords, Comments. Operators & Expressions: Arithmetic, Assignment, Comparison, Logical Operators, String & echo, print for outputting in web page, Loop Statements like for, for each, do while, while, switch and continue.

UNIT-II

Working with flow control through Control Statement: if-else, if-else ladder

Arrays: Introduction to Array, Simple array declaration, use of array, Numeric Array, Associative Array, Multidimensional Array, Array Functions, explode & implode functions

PHP Functions: Defining User-defined functions, variable scope, Passing parameter & return value, Regular expression, Magic constants in PHP, Use of Math functions, String functions, Date & time function, Date formats, Include, Require. HTML Basics, Web FORM Submission: GET/POST methods, using html controls in web page, Super global variables.

UNIT-III

State Management: Redirecting user information to another page, Using Session in web pages for user authentication, Using Cookies in web pages for user authentication.

Object Oriented Programming: Classes, Object & Constructor & Destructor, Using Access Specifier, Inheritance, Traits, Interfaces, Overloading.

Java Script: Syntax, Comments, Variables, Operators, Data Types, Function, Condition, Looping, Introduction to DOM, Events, Form Validation.

Jquery: Syntax , selectors ,Events, effects , Jquery CSS Classes.

UNIT-IV

Ajax: Ajax introduction, XML Http, Request, Response, Event.

Introduction to MySQL: Logging on to MySql, Creating a Database, Creating a Table, Inserting Data into a table, Viewing stored Data, Modifying Stored data, Deleting Stored Data**.**

Data Management in MySQL using PHP: Submitting & showing data to/from web controls from/to database, Uploading files to server/ upload form /upload script.

References:

1. PHP and MYSQL web development, by Luke Welling, Laura Thomson, 4th Edition, Addison-Wesley
   Professional, 2008.
2. PHP 5.1 for Beginners by Ivan Bayross, Sharanam Shah, Shroff/X-Team, 2010.
3. PHP: The Complete Reference by Steven Holzner, McGraw Hill Education, 2017.
4. PHP Pocket Reference by Rasmus Lerdorf, O'Reilly Media, Inc.2000.
5. Head First Php & MySQL by Lynn Beighley, Michael Morrison, Beighley, O′Reilly, 2009.
6. Learning PHP, MySQL & JavaScript by Robin Nixon, 6th edition, Oreilly Publishers, 2021.

Course Outcomes:

CO-1.	Post completing this course successfully, students will get hands on experience on various techniques of web development and will be able to develop a complete website.
CO-2.	This course will provide understanding about database connectivity used for fetching data from servers.
CO-3.	Students can get placements in IT companies after completing this course as a website designer/developer.
CO-4.	Many leading websites and projects are based on PHP and MySQL. So, it provides opportunity for the students to get placed in IT companies.
CO-5.	Students can also become freelancer website designers/developers after learning this course.

B.Sc. (Information Technology)
Semester – V
BIT-354P
Lab I (Computer Networks and Operating System)

Time: 3 Hrs.   **Total Marks: 50**

Credits		
L	**T**	**P**
0	0	2

Practical Marks: 37

Practical Internal Assessment Marks:13

Course Objectives:

1.	To introduce students with basic concepts of Operating System, its functions and services.
2.	To familiarize the students with various views and management policies adopted by O.S. as pertaining with processes, Deadlock, memory, File and I/O operations.
3.	To brief the students about functionality of various OS like Unix, Linux and Windows XP as pertaining to resource management.
4.	Students will learn about various services provided by network.
5.	Describe how computer networks are organized with the concept of layered approach.
6.	Implement a simple LAN with hubs, bridges and switches.

Practical Lab: Computer Networks and Operating System based.

Outcomes: On Completing the course, the students will be able to:

CO-1.	Understand the working of an OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methodsused to implement the different parts of OS.
CO-2.	Understand the main components of an OS & their functions.
CO-3.	Describe the important computer system resources and the role of operating system in their management policies and algorithms.
CO-4.	Evaluate the requirement for process synchronization and coordination handled by operating system.
CO-5.	Implement advance features of operating system in other various language(s).
CO-6.	Understand the working of an OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methods used to implement the different parts of OS.

B.Sc. (Information Technology) Semester – V
BIT-355P
Lab II (PHP)

Time: 3 Hrs.   **Total Marks: 50**

Credits		
L	**T**	**P**
0	**0**	**2**

Practical Marks: 37

Practical Internal Assessment Marks:13

Course Objectives:

1.	The major objective of this course is to provide practical exposure to field of web development and designing using PHP and MySQL.
2.	It will provide students' knowledge to design and develop dynamic database- driven web applications using PHP.
3.	The course provides complete understanding to how to connect to any database to create HTML forms and reports etc.
4.	Many leading websites and projects are based on PHP and MySQL. So, it provides opportunity for the students to get placed in IT companies.

Practical Lab:
- Implementation of various PHP language concepts using XAMPP.
- Implementing data submission tools using PHP.
- Implementing OOP concepts in PHP.
- Implementation of state management concepts in PHP.
- Implementing database handling queries using MySQL.

Course Outcomes:

CO-1.	After successfully completing this course, student becomes able to design and develop websites in PHP.
CO-2.	Provides ability to implement client-server model.
CO-3.	This course will help to understand about basics of database, SQL operations and connectivity of PHP with MYSQL used for fetching data from servers in practical way.
CO-4.	This course will provide hands on training in website designing and logic development using PHP and MySQL which help students to get placement in IT companies.
CO-5.	Students can also work as freelancer website designers/developers after learning this course.

B.Sc. (Information Technology)

Semester-VI

S.N	Course Code	Course Name	Distribution of The Marks				Lectures Per week			Credit Distribution			Total Credit L+T+P	Page No.
			Theory	Internal Assessment	Practical	Total	L	T	P	L	T	P		
Discipline Specific Course(DSC)														
1	BIT-361	Computer Graphics	75	25	-	100	5	1	0	3	1	0	4	77-78
2	BIT-362	Internet Applications and E-Business	75	25	-	100	5	1	0	3	1	0	4	79-80
Skill Enhancement Course(SEC)														
3	BIT-363P	Lab (Applications of Computer Graphics in C/C++ and HTML)	-	13	37	50	0	0	6	0	0	2	2	81
4	BIT-364P	Project	0	50	150	200	0	0	24	0	0	8	8	82
										Total Credits=18				

B.Sc. (Information Technology) Semester – VI

BIT-361: Computer Graphics

Time: 3 Hrs.   **Total Marks: 100**

Credits		
L	T	P
3	1	0

Theory Marks: 75

Theory Internal Assessment Marks:25

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 marks each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The studentsare required to attempt one question from each of these sections.**

Course Objectives:

1.	Introduction to the basic concepts of computer graphics.
2.	Develop programming skills in computer graphics
3.	Learning how to scale, translate (shift), shear (skew), and rotate different graphical objects
4.	Develop skills of creating 2D and 3D objects.

UNIT-I

Preliminaries

Basics of Computer Graphics: Computer Graphics and their applications, Graphics Software.
Display Devices: CRT Monitors (Random – Scan and Raster Scan), DVST, Plasma – Panel Display, LED and LCD Monitors.

2D Primitives

Points and various line drawing Algorithms: DDA, Integer DDA, Incremental DDA, Bresenham's algorithm and their comparisons. Circle generating algorithms: trigonometric, polynomial, Bresenham's and midpoint method. Simple line clipping algorithms: Cohen–Sutherland Algorithm**,** Midpoint Subdivision Line Algorithm.

UNIT-II

2D-Transformations

Basic Transformations, Scaling, Translation, Rotation, Reflection, Shear, Matrix representation of Basic transformations and homogenous coordinates.
Composite 2D-Transformations.

UNIT-III

3D-Transformations
3D Coordinate Systems. 3D transformations: translation, scaling, rotation.
Hidden Surfaces
Depth comparisons, Z-buffer algorithm, Scan line algorithms.

UNIT-IV

Projections
Parallel Projections, Perspective Projections, Oblique Projections.
Implementation in C: C programming for drawing 2 D objects – line rectangle, arc, circle and ellipse. C Programming for 2–D and 3–D transformations which include translation, rotation, scaling, reflection and shear.

References:

1. Donald Hearn & M. Pauline Baker, 'Computer Graphics', Pearson Education India, 2nd edition, 2008.
2. Foley, Van Dam, Feiner, Hughes, 'Computer Graphics: Principles and Practice', Pearson Education India, Addison-Wesley, 3rd edition, 2013.
3. David F. Rogers, 'Procedural Elements for Computer Graphics', McGraw Hill Book Company, 2006.
4. Roy Plastock 'Computer Graphics', Schaum's outlines, McGraw Hill Book Company, 2007.

Course Outcomes:

At the end of this course student will be able to:

CO-1.	Understands the different areas and applications of Computer Graphics.
CO-2.	Students will be able to describe the fundamental algorithms used in computer graphics and to some extent be able to compare and evaluate them
CO-3.	Knowledge of designing and developing 2D and 3D objects using programs.
CO-4.	Understands the different geometric transformations on graphic objects and applying them in composite form.
CO-5.	Learn different projections and visible surface detection techniques.
CO-6.	Use of Line Clipping algorithms to extract lines.

BIT-362: Internet Applications and E- Business

Time: 3 Hrs.   **Total Marks: 100**

Credits		
L	**T**	**P**
3	**1**	**0**

Theory Marks: 75

Theory Internal Assessment Marks:25

Note for paper setter and students:

1. **Medium of Examination is English Language.**
2. **There will be five sections.**
3. **Section A is compulsory and will be of 15 marks consisting of 8 short answer type questions carrying 2.5 marks each covering the whole syllabus. The answer should not exceed 50 words. The students will have to attempt any 6 questions in this section.**
4. **Sections B, C, D and E will be set from units I, II, III & IV respectively and will consist of two questions of 15 marks each from the respective unit. The studentsare required to attempt one question from each of these sections.**

Course Objectives:

1.	The primary goal is to prepare students for full knowledge of internet its application, working of Internet and practical use of internet for online transactions like use of e-banking.
2.	To get good knowledge of internet protocol, working of all protocols
3.	Also you can learn how to design web pages in HTML and DHTML practically.
4.	To get good knowledge of various modes of online payment.
5.	Also you can learn various security mechanisms.

UNIT-I

Introduction: About internet and its working, business use of internet, services offered by internet, evolution of internet, Internet Service Provider (ISP), internet addressing (DNS) and IP addresses. E–Mail Basic Introduction, advantage and disadvantage, structure of an email message, working of e–mail (sending and receiving messages), managing email (creating new folder, deleting messages, forwarding messages, filtering messages, implementation of outlook express. Internet protocol Introduction, File transfer protocol (FTP), Gopher, Telnet, other protocols like HTTP and TCP/IP. WWW introduction, working of WWW, Web browsing (opening, viewing, saving and printing a web page and bookmark), web designing using HTML, DHTML with programming techniques.

UNIT-II

E – Commerce: Its definition, aims, process tools and results, EDI, VAN's and internet as Promoters, Types of E – Commerce, Commerce – net.

Steps to Start E – Commerce: H/W & S/W Requirements, steps involved in opening your own online business.

E-Security: Information system Security – Security on the Internet – E-business Risk Management Issues – Information Security Environment in India. Legal and Ethical Issues : Cybers talking – Privacy is at Risk in the Internet Age – Phishing – Application Fraud – Skimming – Copyright – Internet Gambling – Threats to Children.

UNIT-III
E-Payment Systems: Main Concerns in Internet Banking – Digital Payment Requirements – Digital Token-based e-payment Systems – Classification of New Payment Systems – Properties of Electronic Cash – Cheque Payment Systems on the Internet – Risk and e-Payment Systems – Designing e-payment Systems – Digital Signature – Online Financial Services in India - Online Stock Trading.

UNIT-IV
Information systems for Mobile Commerce: What is Mobile Commerce? – Wireless Applications – Cellular Network – Wireless Spectrum – Technologies for Mobile Commerce – Wireless Technologies –Different Generations in Wireless Communication – Security Issues Pertaining to Cellular Technology. Portals for E-Business: Portals – Human Resource Management – Various HRIS Modules.

References:

1. **"**Understanding The Internet", Kieth Sutherland, Butterworth-Heinemann; 1st Edition (October 31, 2000).
2. "Internet Technologies", S. K. Bansal, APH Publishing Corporation (April 1, 2002).
3. "Data Communications and Networking", Behrouz A. Forouzan, 3rd Edition, 2004.
4. E – Commerce –The Cutting Edge of Business. By: Kamlesh K. Bajaj. Debjani Nag; Second Edition, 2017.
5. David Whiteley, "E-Commerce Strategy, Technologies and Applications", Tata McGraw Hill, 2001.
6. Ravi Kalakota, Andrew B Whinston, "Frontiers of Electronic Commerce", Pearson 2006, 12th Impression.
7. P.T.Joseph, S.J., "E-Commerce - An Indian Perspective", PHI 2012, 4th Edition.

Course Outcomes:
At the end of this course student will be able to:

CO-1.	Describe how to define internet, www, various protocols
CO-2.	Demonstrate an understanding of working of internet.
CO-3.	Students will be able to create email id and use it for sending online mails and attachments.
CO-4.	Students will be able to judge which connection should they use for getting an internet at home or work.
CO-5.	Analyze the impact of E-commerce on business models and strategy.
CO-6.	Students will have understanding of the foundations and importance of E-commerce.
CO-7.	Describe Internet trading relationships including Business to Consumer, Business-to Business, Intra-organizational.
CO-8.	Discuss legal issues and privacy in E-Commerce and assess electronic payment systems.

B.Sc. (Information Technology)
Semester – VI

BIT-363P: Lab (Applications of Computer Graphics in C/C++ and HTML)

Time: 3 Hrs.   **Total Marks: 50**

Credits		
L	**T**	**P**
0	**0**	**2**

Practical Marks: 37

Practical Internal Assessment Marks:13

Course Objectives:

1.	Make the students understand the concept of graphics.
2.	Acquaintance with mathematics behind graphical transformation.
3.	Design, develop and implement two and three dimensional graphical structures.
4.	Use Html to draw graphical objects on webpage.

Practical Lab: Applications of Computer Graphics in C++/C and HTML

Course Outcomes:

At the end of this course student will be able to:

CO-1.	Learn the concept of raster and random scans.
CO-2.	Implement the algorithms for 2D primitives: Line and Circle drawing.
CO-3.	Implement different line clipping algorithms.
CO-4.	Apply various 2D and 3D transformation techniques (Translation, Rotation, Scaling, Reflection and Shearing).
CO-5.	Implementation of different types of Projections (Parallel and Perspective).
CO-6.	Draw various graphical objects using HTML.

B.Sc. (Information Technology) Semester – VI

BIT-364P: PROJECT

Time: 3 Hrs. **Total Marks: 200**

Practical Marks: 150

Credits		
L	**T**	**P**
0	0	8

Practical Internal Assessment Marks:50

Course Objectives:

1.	The main objective of this course is to develop a software module based on the programming and database concepts learnt throughout the programme.
2.	Students will use programming and database management skills to develop a solution of a real-life problem using any programming language and database platform.
3.	The students will design, implement and evaluate a computing based solution to meet a given set of requirements.

General Instructions:

1. A software module based on the knowledge of the entire course is to be developed. Students can opt any programming language and DBMS on the basis of their area of interest.
2. The soft copy of the module shall be submitted to the College/Institute till April 20 or prescribed date.
3. The software module shall be developed in groups, consisting of at most two students in a group.
4. A detailed report consisting Requirement Analysis, Feasibility analysis, DFD, E-R diagrams and Test cases must be prepared by students under the supervision of their respective guide.
5. The college shall depute guide(s)/supervisor(s) under whose supervision the software module shall be developed. The guide/supervisor shall clarify that the work done is original & authenticated. The certificate found to be incorrect at any stage shall attract the proceedings against all the stakeholders, as per the University rules.
6. The evaluation of the module shall be done as per the common ordinance of UG/PG w.e.f. 2012-2013 under semester system.
7. Students have to study existing systems based on their project topic in detail at client/customer site. Training certificate of industrial training should be submitted to the College and also attached in the project.

Course Outcomes:

CO-1.	Post successfully completing this course, student becomes able to design and develop a software module or website.
CO-2.	Students can opt for software/website development field to build their career.
CO-3.	Students can also work as freelancer to build solutions of various programming and/or website development related problems.
CO-4.	After successful completion of this course, students can also get excellent placements in various multinational companies.