FACULTY OF ENGINEERING & TECHNOLOGY

SYLLABUS FOR THE BATCH FROM YEAR 2022 TO YEAR 2025

FOR

B.SC. (INFORMATION TECHNOLOGY)

(SEMESTER: I–VI)

EXAMINATION: 2022-25

GURU NANAK DEV UNIVERSITY AMRITSAR

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SCHEME
SEMESTER – I

Paper No.	Subjects	M. Marks
Paper – 1	Fundamentals of Computers	75
Paper – 2	Introduction to Programming – C	75
Paper – 3	Applied & Discrete Mathematics	75
Paper – 4	Practical – PC Computing & C Language–I	75
Paper – 5	Communication Skills in English – I (Compulsory Paper)	50
Paper – 6	Punjabi Compulsory (Compulsory Paper) **OR** ** ਮੁੱਢਲੀ ਪੰਜਾਬੀ **OR** ** Punjab History & Culture (From Earliest Times to C 320)	50

*Special Note:

1. ਜਿਹੜੇ ਵਿਦਿਆਰਥੀ **Domicile/Non-Domicile of Punjab** ਹਨ ਅਤੇ ਉਨ੍ਹਾਂ ਨੇ ਅੱਠਵੀਂ/ਦਸਵੀਂ ਜਮਾਤ ਤੱਕ ਪੰਜਾਬੀ ਵਿਸ਼ਾ ਪੜ੍ਹਿਆ ਹੈ, ਉਹ ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ (ਲਾਜ਼ਮੀ) ਪੜ੍ਹਨਗੇ।

2. ਜਿਹੜੇ ਵਿਦਿਆਰਥੀ **Non-Domicile of Punjab** ਹਨ ਅਤੇ ਅੱਠਵੀਂ/ਦਸਵੀਂ ਜਮਾਤ ਤੱਕ ਪੰਜਾਬੀ ਵਿਸ਼ਾ ਨਹੀਂ ਪੜ੍ਹਿਆ ਹੈ, ਉਹ ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਜਾਂ ਪੰਜਾਬ ਹਿਸਟਰੀ ਐਂਡ ਕਲਚਰ ਵਿੱਚੋਂ ਕੋਈ ਇੱਕ ਵਿਸ਼ਾ ਚੁਣ ਸਕਦੇ ਹਨ।

3. ਜਿਹੜੇ ਵਿਦਿਆਰਥੀ **Domicile of Punjab** ਹਨ, ਪੰਤੂ ਕਿਸੇ ਕਾਰਣ ਪੰਜਾਬ ਤੋਂ ਬਾਹਰ ਪੜ੍ਹੇ ਹਨ ਅਤੇ ਉਨ੍ਹਾਂ ਨੇ ਅੱਠਵੀਂ/ਦਸਵੀਂ ਜਮਾਤ ਤੱਕ ਪੰਜਾਬੀ ਵਿਸ਼ਾ ਨਹੀਂ ਪੜ੍ਹਿਆ ਹੈ, ਉਹ ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਦਾ ਹੀ ਵਿਸ਼ਾ ਪੜ੍ਹਨਗੇ।

4. ਜਿਹੜੇ ਵਿਦਿਆਰਥੀ **Domicile of Punjab** ਹਨ ਅਤੇ ਪੰਜਾਬ ਦੇ ਕੇਂਦਰੀ ਵਿਦਿਆਲਿਆ ਜਾਂ ਕਿਸੇ ਹੋਰ ਸਕੂਲ ਵਿੱਚ ਪੜ੍ਹੇ ਹਨ ਅਤੇ ਕਿਸੇ ਕਾਰਣ ਉਨ੍ਹਾਂ ਨੇ ਅੱਠਵੀਂ/ਦਸਵੀਂ ਜਮਾਤ ਤੱਕ ਪੰਜਾਬੀ ਵਿਸ਼ਾ ਨਹੀਂ ਪੜ੍ਹਿਆ ਹੈ, ਉਹ ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਦਾ ਵਿਸ਼ਾ ਹੀ ਪੜ੍ਹਨਗੇ।

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SEMESTER – II

Paper No.	Subjects	M. Marks
Paper – 1	Principles of Digital Electronics	75
Paper – 2	Introduction to Programming C++	75
Paper – 3	Numerical Methods & Statistical Techniques	75
Paper – 4	Practical C++ Language (Practical)	75
Paper – 5	Communication Skills in English – II (Compulsory Paper) (Th.35+Pr.15)	50
Paper – 6	Punjabi Compulsory (Compulsory Paper) **OR** ** ਮੁੱਢਲੀ ਪੰਜਾਬੀ **OR** ** Punjab History & Culture (C 320 TO 1000 A.D.)	50
Paper – 7	* Drug Abuse: Problem, Management and Prevention (Compulsory Paper)	100

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SEMESTER – III

Paper No.	Subjects	M. Marks
Paper – I	Introduction to Python	75
Paper – II	Data Structure	75
Paper – III	System Analysis & Design	75
Paper – IV	Programming Lab – I (Python, Programming Language)	50
Paper – V	Programming Lab – II (Data Structure)	25

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SEMESTER – IV

Paper No.	Subjects	M. Marks
Paper – I	Database Management System	75
Paper – II	Internet Applications	75
Paper – III	JAVA & Web Designing	75
Paper – IV	Web Technologies	75
Paper – V	Programming Lab – I (Oracle)	50
Paper – VI	Programming Lab – II HTML & (JAVA)	50
Paper – VII	* (**ESL-221**) Environmental Studies (Compulsory Paper)	100

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

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SEMESTER – V

Paper No.	Subjects	M. Marks
Paper – I	Computer Networks	100
Paper – II	Operating System	100
Paper – III	E-Business	100
Paper – IV	Lab – I (Computer Networks)	50
Paper – V	Lab – II (Operating System)	50

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SEMESTER – VI

Paper No.	Subjects	M. Marks
Paper – I & II: (Will be based on any of the three specialization options)	**Option(I): Computer Graphics**	
	Paper–I: Computer Graphics	75
	Paper–II: Applications of Computer Graphics in C++/C	25
	Option(II): Network Management	
	Paper–I: Network Operating System/Client Server Application	75
	Paper–II: Practical Lab based on NOS	25
	Option(III):	
	Paper–I: Fundamentals of Cloud Computing	100
Paper – III:	Project	300

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–I
Paper – I: Fundamentals of Computers

Time: 3 Hours   **Max. Marks: 75**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION–A
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.

SECTION–B
2. Operating System Concepts:
Role of an Operating System, Types of operating systems, Booting procedure and its types, Fundamentals and typical instructions of Windows & Non-Windows based Operating Systems.

SECTION–C

3. MS Word (Word for Windows):
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.

SECTION–D
4. MS – PowerPoint:
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.

Text Books:
  1. R.K. Taxali : Introduction to Software Packages, Galgotia Publicaions.
  2. MS–Office 2003, Compiled by SYBIX.
  3. MS–Office 2003, BPB Publications.
  4. Introduction to Computer, P.K. Sinha.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–I
Paper–II: Introduction to Programming - C

Time: 3 Hours   M. Marks: 75

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION–A
Fundamentals: Character set, Identifiers and Key Words, Data types, Constants, Variables, Expressions, Statements, Symbolic Constants.

Operations and Expressions: Arithmetic operators, Unary operators, Relational Operators, Logical Operators, Assignment and Conditional Operators, Library functions. Data Input and Output statements

SECTION–B
Control Statements: Preliminaries, While, Do–while and for statements, Nested loops, If–else, Switch, Break – Continue statements.

Program Structure Storage Class: Automatic, external and static variables, multiple programs, more about library functions.

SECTION–C
Functions: Brief overview, defining, accessing functions, passing arguments to function, specifying argument data types, function prototypes, recursion.

Arrays: Defining, processing an array, passing arrays to a function, multi–dimensional arrays.
Strings: String declaration, string functions and string manipulation

SECTION–D
Structures & Unions: Defining and processing a structure, user defined data types, structures and pointers, passing structures to functions, self referenced structure, unions.

Pointers: Fundamentals, pointer declaration, passing pointer to a function, pointer and one-dimensional arrays, operation on pointers, pointers & multi–dimensional arrays of pointers, passing functions, other functions, more about pointer declarations.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

References:

1. Balaguruswamy: "Programming in ANSI C".

2. Scaum Outline Series: "Programming in C".

3. Dennis & Ritchie: "Programming in C".

4. Stephen G. Kochar: "C Programming".

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–I
Paper III: Applied & Discrete Mathematics
Time: 3 Hours   **M. Marks: 75**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION–A
Sets and Relations: Definition of sets, subsets, complement of a set, universal set, intersection and union of sets, De-Morgan's laws, Cartesian products, Equivalent sets, Countable and uncountable sets, minset, Partitions of sets, Relations: Basic definitions, graphs of relations, properties of relations

SECTION–B
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.

SECTION–C
Boolean Algebra: Boolean algebra and its duality, Duality, Boolean Algebra as Lattices, Boolean identities, sub-algebra, Representation Theorem, Sum-of-Products Form for Sets, Sum of-Products Form for Boolean Algebra, Minimal Boolean Expressions, Prime Implicants, Boolean Functions, Karnaugh Maps.

SECTION–D
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, Matrix Inversion method.

References:
1. Lipschutz, S. and Lipson, M.: Discrete Mathematics (Schaum's outlines series).

2. Kolman and Busby "Discrete Mathematical structures for Computer Sciences" PHI.

3. Alan Doerr,"Applied Discrete Structures for Computer Science", Galgotia Publications.

4. Trambley, J.P. and Manohar,R: Discrete Mathematical Structures with Applications to Computer Science.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–I
Paper – IV: (Practical)

PC Computing and C Language-I

Time: 3 Hours   **Max. Marks: 75**

Practical – C Language Part I & PC Computing

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SEMESTER - I

PAPER–V: COMMUNICATION SKILLS IN ENGLISH–I
(THEORY)

Time: 3 Hours   **Max. Marks: 50**
Instructions for the Paper Setters: -
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The syllabus is divided in four sections as mentioned below:

SECTION–A
Reading Skills: Reading Tactics and strategies; Reading purposes–kinds of purposes and associated comprehension; Reading for direct meanings.

SECTION–B
Reading for understanding concepts, details, coherence, logical progression and meanings of phrases/ expressions.
Activities:
- Comprehension questions in multiple choice format
- Short comprehension questions based on content and development of ideas

SECTION–C
Writing Skills: Guidelines for effective writing; writing styles for application, personal letter, official/ business letter.
Activities:
- Formatting personal and business letters.
- Organising the details in a sequential order

SECTION–D
Resume, memo, notices etc.; outline and revision.
Activities:
- Converting a biographical note into a sequenced resume or vice-versa
- Ordering and sub-dividing the contents while making notes.
- Writing notices for circulation/ boards
Recommended Books:
- *Oxford Guide to Effective Writing and Speaking* by John Seely.
- *English Grammar in Use* (Fourth Edition) by Raymond Murphy, CUP

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SEMESTER–I

PAPER–VI : ਪੰਜਾਬੀ (ਲਾਜ਼ਮੀ)

ਸਮਾਂ : 3 ਘੰਟੇ   ਕੁਲ ਅੰਕ : 50

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ।
   ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਸਾਰੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਅੰਕ ਬਰਾਬਰ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ
   ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਪਾਠ-ਕ੍ਰਮ ਅਤੇ ਪਾਠ-ਪੁਸਤਕਾਂ

ਸੈਕਸ਼ਨ-ਏ

ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ (ਸੰਪਾ. ਡਾ. ਰਮਿੰਦਰ ਕੌਰ, ਡਾ. ਮੇਘਾ ਸਲਵਾਨ)
(ਕਵਿਤਾ ਅਤੇ ਕਹਾਣੀ ਭਾਗ)
(ਕਵਿਤਾ ਦੀ ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ/ਸਾਰ) (ਕਹਾਣੀ ਦਾ ਵਿਸ਼ਾ-ਵਸਤੂ/ਸਾਰ)

ਸੈਕਸ਼ਨ-ਬੀ

ਇਤਿਹਾਸਕ ਯਾਦਾਂ
(ਜੀਵਨੀ 1 ਤੋਂ 6 ਤੱਕ)
ਵਿਸ਼ਾ-ਵਸਤੂ ਅਤੇ ਸਾਰ

ਸੈਕਸ਼ਨ-ਸੀ

(ੳ)   ਪੈਰ੍ਹਾ ਰਚਨਾ
(ਅ)   ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ

ਸੈਕਸ਼ਨ-ਡੀ

ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ :
ਭਾਸ਼ਾ ਦਾ ਟਕਸਾਲੀ ਰੂਪ, ਭਾਸ਼ਾ ਅਤੇ ਉਪਭਾਸ਼ਾ ਵਿਚਲਾ ਅੰਤਰ,
ਪੰਜਾਬੀ ਉਪਭਾਸ਼ਾਵਾਂ ਦੇ ਪਛਾਣ ਚਿੰਨ੍ਹ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ – ਨਿਕਾਸ ਤੇ ਵਿਕਾਸ

ਸਹਾਇਕ ਪੁਸਤਕਾਂ

1. ਰਾਜਿੰਦਰਪਾਲ ਸਿੰਘ ਬਰਾੜ, **ਪੰਜਾਬੀ ਕਵਿਤਾ ਦਾ ਇਤਿਹਾਸ**, ਪੰਜਾਬੀ ਅਕਾਦਮੀ, ਦਿੱਲੀ।
2. ਬ੍ਰਹਮਜਗਦੀਸ਼ ਸਿੰਘ, **ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਾਵਿ ਸਿਧਾਂਤ, ਇਤਿਹਾਸ ਅਤੇ ਪ੍ਰਵਿਰਤੀਆਂ**, ਵਾਰਿਸ ਸ਼ਾਹ ਫ਼ਾਊਂਡੇਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।
3. ਬਲਦੇਵ ਸਿੰਘ ਧਾਲੀਵਾਲ, **ਪੰਜਾਬੀ ਕਹਾਣੀ ਦਾ ਇਤਿਹਾਸ**, ਪੰਜਾਬੀ ਅਕਾਦਮੀ, ਦਿੱਲੀ।
4. ਸਤਿੰਦਰ ਸਿੰਘ, **ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਵਾਰਤਕ ਦਾ ਇਤਿਹਾਸ**, ਪੰਜਾਬੀ ਅਕਾਦਮੀ, ਦਿੱਲੀ।
5. ਡਾ. ਰਮਿੰਦਰ ਕੌਰ, **ਪੰਜਾਬੀ ਕਹਾਣੀ ਦਾ ਸਫ਼ਰ ਤੇ ਸ਼ਾਸਤ੍ਰ ਭਾਗ-I**, ਸਿੰਘ ਬ੍ਰਦਰਜ਼, ਅੰਮ੍ਰਿਤਸਰ।
6. ਹਰਕੀਰਤ ਸਿੰਘ, **ਭਾਸ਼ਾ ਤੇ ਭਾਸ਼ਾ ਵਿਗਿਆਨ**, ਲਾਹੌਰ ਬੁੱਕ ਸ਼ਾਪ, ਲੁਧਿਆਣਾ।
7. ਹਰਕੀਰਤ ਸਿੰਘ ਤੇ ਗਿਆਨੀ ਲਾਲ ਸਿੰਘ, **ਕਾਲਜ ਪੰਜਾਬੀ ਵਿਆਕਰਨ**, ਪੰਜਾਬ ਯੂਨੀਵਰਸਿਟੀ, ਚੰਡੀਗੜ੍ਹ।
8. ਬੂਟਾ ਸਿੰਘ ਬਰਾੜ, **ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਸਿਧਾਂਤ ਤੇ ਵਿਹਾਰ**, ਚੇਤਨਾ ਪ੍ਰਕਾਸ਼ਨ, ਲੁਧਿਆਣਾ।
9. ਮਿੰਨੀ ਸਲਵਾਨ, **ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਮੁੱਢਲੇ ਸੰਕਲਪ**, ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ
10. **ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਬੋਧ**, ਕਸਤੂਰੀ ਲਾਲ ਐਂਡ ਸੰਨਜ਼, ਅੰਮ੍ਰਿਤਸਰ।

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SEMESTER–I

PAPER–VI : ਮੁੱਢਲੀ ਪੰਜਾਬੀ

((In lieu of Compulsory Punjabi)
(For those students who are not domicile of Punjab)

ਸਮਾਂ : 3 ਘੰਟੇ   ਕੁਲ ਅੰਕ: 50

ਅੰਕ–ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ–ਪ੍ਰਸ਼ਨਾਂ ਵਿੱਚ ਕਰ ਸਕਦਾ ਹੈ।

ਪਾਠ–ਕ੍ਰਮ
ਸੈਕਸ਼ਨ–ਏ

ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਤੇ ਗੁਰਮੁਖੀ ਲਿਪੀ

(ੳ) ਨਾਮਕਰਨ ਤੇ ਸੰਖੇਪ ਜਾਣ–ਪਛਾਣ : ਗੁਰਮੁਖੀ ਵਰਣਮਾਲਾ, ਅੱਖਰ ਕ੍ਰਮ, ਸਵਰ ਵਾਹਕ (ੳ ਅ ੲ), ਲਗਾਂ–ਮਾਤਰਾਂ, ਪੈਰ ਵਿਚ ਬਿੰਦੀ ਵਾਲੇ ਵਰਣ, ਪੈਰ ਵਿਚ ਪੈਣ ਵਾਲੇ ਵਰਣ, ਬਿੰਦੀ, ਟਿੱਪੀ, ਅਧਕ।

(ਅ) ਸਿਖਲਾਈ ਤੇ ਅਭਿਆਸ

ਸੈਕਸ਼ਨ–ਬੀ

ਗੁਰਮੁਖੀ ਆਰਥੋਗ੍ਰਾਫੀ ਅਤੇ ਉਚਾਰਨ : ਸਵਰ, ਵਿਅੰਜਨ : ਮੁਢਲੀ ਜਾਣ–ਪਛਾਣ ਅਤੇ ਉਚਾਰਨ, ਮੁਹਾਰਨੀ, ਲਗਾਂ–ਮਾਤਰਾਂ ਦੀ ਪਛਾਣ।

ਸੈਕਸ਼ਨ–ਸੀ

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।

ਸੈਕਸ਼ਨ–ਡੀ

ਲਗਾਖ਼ਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅਧਕ ਵਾਲੇ ਸ਼ਬਦ)

ਸ਼ੁਧ, ਅਸ਼ੁਧ (ਪੈਰ੍ਹੇ ਵਿਚ ਲਿਖੇ ਅਸ਼ੁਧ ਸ਼ਬਦਾਂ ਨੂੰ ਸ਼ੁਧ ਕਰਨਾ)

ਸਹਾਇਕ ਪੁਸਤਕਾਂ

1.   ਬ੍ਰਹਮਜਗਦੀਸ਼ ਸਿੰਘ, **ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਤੇ ਗੁਰਮੁਖੀ ਲਿਪੀ**, ਵਾਰਿਸ ਸ਼ਾਹ ਫਾਊਂਡੇਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।
2.   ਪ੍ਰੋ. ਸ਼ੈਰੀ ਸਿੰਘ, ਪ੍ਰੋ. ਬ੍ਰਹਮਜਗਦੀਸ਼ ਸਿੰਘ, **ਭਾਸ਼ਾ ਵਿਗਿਆਨ : ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਤੇ ਗੁਰਮੁਖੀ ਲਿਪੀ**, ਵਾਰਿਸ ਸ਼ਾਹ ਫਾਊਂਡੇਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।
3.   **ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਬੋਧ**, ਕਸਤੂਰੀ ਲਾਲ ਐਂਡ ਸੰਨਜ਼, ਅੰਮ੍ਰਿਤਸਰ।
4.   ਸਿੰਨੀ ਸਲਵਾਨ, **ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਮੁਢਲੇ ਸੰਕਲਪ**, ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SEMESTER - I
PAPER–VI: 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)

Time: 3 Hours   **Max. Marks: 50**
Instructions for the Paper Setters
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION- A
1. Physical features of the Punjab and its impact on history.
2. Sources of the ancient history of Punjab

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

SECTION- C
5. Social, Religious and Economic life during *Rig* Vedic Age.
6. Social, Religious and Economic life during Later Vedic Age.

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

Suggested Readings
1. L. M Joshi (ed.), *History and Culture of the Punjab*, Art-I, Patiala, 1989 (3rd edition)
2. L.M. Joshi and Fauja Singh (ed.), *History of Punjab*, Vol.I, Patiala 1977.
3. Budha Parkash, *Glimpses of Ancient Punjab*, Patiala, 1983.
4. B.N. Sharma, *Life in Northern India*, Delhi. 1966.
5. Chopra, P.N., Puri, B.N., & Das, M.N.(1974). *A Social, Cultural & Economic History of India,* Vol. I, New Delhi: Macmillan India.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–II
Paper–I : Principles of Digital Electronics

Time: 03 Hours: **M. Marks: 75**

Instructions for the Paper Setters: -
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION–A
Number System: Introduction, number conversion system, binary arithmetic, representation of signed binary numbers, 1's and 2's complement, Codes: straight binary code, BCD Code Excess3 Code, Grey Code ASCII, Integer and floating point representation

SECTION–B
Logic Gates and Boolean Algebra: Logic gates, Universal Gates, Boolean algebra and Minimization techniques, canonical forms of Boolean expressions, K-Map

SECTION–C
Combinational Circuits: Adder, Subtracter, Multiplexer, Demultiplexer, Decoder, Encoder

Sequential Circuits: Flip-flops, clocks and timers, registers, counter

SECTION–D
Semiconductor memories: Introduction, Static and dynamic devices, read only & random access memory chips, PROMS and EPROMS Address selection logic. Read and write control timing diagrams for ICs

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.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–II
Paper–II : Introduction to Programming C++

Time: 3 Hours   M. Marks: 75

Instructions for the Paper Setters: -
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION–A
Programming Paradigms: Introduction to the object oriented approach towards programming by discussing Traditional, Structured Programming methodology.

Objects & Classes: Object Definition, Instance, Encapsulation, Data Hiding, Abstraction, Inheritance, Messages, Method, Polymorphism, Classes, Candidate & Abstract Classes to be examples of the Design process.

SECTION–B
Object Oriented Programming using C++: Characteristics of OOP, Overview of C++, I/O using cout and cin, Objects and Classes, Member functions and data, private & public, constructor & destructor, Constructor Overloading, Types of Constructors.

SECTION–C
Function Overloading: Function Overloading, Default Arguments, Ambiguity in Function Overloading.

Operator Overloading: Overloading unary and binary operators, Type Conversion using Operator Overloading

SECTION–D
Inheritance: Concept of inheritance, Base & derived classes, Access Specifiers, Class Hierarchies, Types of Inheritance with examples.

Virtual Functions and Polymorphism: Virtual functions, friend functions, static function, this *pointer, polymorphism, Types of Polymorphism with examples, templates, class templates.*

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Books:

1. Teach yourself C++, Herbert Schildth, Tata McGraw Hill.

2. Designing Object Oriented Software Rebacca Wirfs - Brock Brian Wilerson, PHI.

3. Object Oriented Programming in Turbo C++, Robert Lafore, Galgotia Publication.

4. Designing Object Oriented Applications using C++ & Booch Method, Robert C. Martin.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–II

Paper – III : Numerical Methods and Statistical Techniques

Time: 3 Hours   **Max. Marks: 75**

Instructions for the Paper Setters: -
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION–A

Introduction:
Numerical Methods, Numerical methods versus numerical analysis, Errors and Measures of Errors.

Non–linear Equations, iterative Solutions, Multiple roots and other difficulties, Interpolation methods, Methods of bi–section, False position method, Newton Raphson – method.

Simultaneous Solution of Equations: Gauss Elimination Method, Gauss Jordan Method, numerical Integration and different Trapezoidal Rule, Simpson's 3/8 Rule.

SECTION–B

Interpolation and Curve Fitting, Lagrangian Polynomials, Newton's Methods: Forward Difference Method, Backward Difference Method Divided Difference Method.

SECTION–C

Statistical Techniques:
Measure of Central Tendency, Mean Arithmetic, Mean Geometric, Mean Harmonic, Mean, Median, Mode.
Measure of Dispersion, Mean Deviation, Standard Deviation, Co–efficient of Variation,

SECTION–D

Least square fit linear trend, Non–linear trend.
$Y = ax^b$
$Y = ab^x$
$Y = ae^x$
Polynomial fit: $Y = a+bx+cn^2$

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Books Recommended:

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.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–II

Paper–IV   : C++ Language

(Practical)

Max Marks: 75

Practical – Implementation of Numerical Methods and Statistical Techniques Using C++ Language

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SEMESTER - II
PAPER–V: COMMUNICATION SKILLS IN ENGLISH – II

Time: 3 Hours   **Max. Marks: 50**
                                                              Theory Marks: 35
                                                              Practical Marks: 15

Instructions for the Paper Setters: -
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Contents:
SECTION–A
Listening Skills: Barriers to listening; effective listening skills; feedback skills.
Activities: Listening exercises – Listening to conversation, News and TV reports

SECTION–B
Attending telephone calls; note taking and note making.
Activities: Taking notes on a speech/lecture

SECTION–C
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.
Activities: **1)** Making conversation and taking turns
                    2) Oral description or explanation of a common object, situation or concept

SECTION–D
The study of sounds of English,
Stress and Intonation,
Situation based Conversation in English,
Essentials of Spoken English.
Activities: Giving Interviews

PRACTICAL / ORAL TESTING
                                                              Marks : 15
Course Contents: -
1.   Oral Presentation with/without audio visual aids.
2.   Group Discussion.
3.   Listening to any recorded or live material and asking oral questions for listening comprehension.

Questions: -
  1. Oral Presentation will be of 5 to 10 minutes duration (Topic can be given in advance or it can be student's own choice). Use of audio visual aids is desirable.
  2. Group discussion comprising 8 to 10 students on a familiar topic. Time for each group will be 15 to 20 minutes.

Note: Oral test will be conducted by external examiner with the help of internal examiner.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SEMESTER - II
PAPER–VI : ਪੰਜਾਬੀ (ਲਾਜ਼ਮੀ)

ਸਮਾਂ : 3 ਘੰਟੇ   ਕੁਲ ਅੰਕ : 50

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ।
    ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਸਾਰੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਅੰਕ ਬਰਾਬਰ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ
    ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਪਾਠ-ਕ੍ਰਮ ਅਤੇ ਪਾਠ-ਪੁਸਤਕਾਂ

ਸੈਕਸ਼ਨ-ਏ

ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ (ਸੰਪਾ. ਡਾ. ਰਮਿੰਦਰ ਕੋਰ, ਡਾ. ਮੇਘਾ ਸਲਵਾਨ)
(ਨਿਬੰਧ ਅਤੇ ਰੇਖਾ ਚਿੱਤਰ)
ਨਿਬੰਧ ਦਾ ਸਾਰ/ਵਿਸ਼ਾ-ਵਸਤੁ
ਰੇਖਾ ਚਿੱਤਰ ਦਾ ਨਾਇਕ ਬਿੰਬ/ਵਿਸ਼ਾ ਵਸਤੁ

ਸੈਕਸ਼ਨ-ਬੀ

ਇਤਿਹਾਸਕ ਯਾਦਾਂ
(ਜੀਵਨੀ 7 ਤੋਂ 12 ਤੱਕ)
ਵਿਸ਼ਾ-ਵਸਤੁ ਅਤੇ ਸਾਰ

ਸੈਕਸ਼ਨ-ਸੀ

(ੳ)   ਸ਼ਬਦ ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ ਰਚਨਾ, ਪਰਿਭਾਸ਼ਾ, ਮੁਢਲੇ ਸੰਕਲਪ
(ਅ)   ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ

ਸੈਕਸ਼ਨ-ਡੀ

ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ
ਮੁਹਾਵਰੇ ਅਤੇ ਅਖਾਣ

ਸਹਾਇਕ ਪੁਸਤਕਾਂ

1. ਸਤਿੰਦਰ ਸਿੰਘ, **ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਵਾਰਤਕ ਦਾ ਇਤਿਹਾਸ**, ਪੰਜਾਬੀ ਅਕਾਦਮੀ, ਦਿੱਲੀ।
2. ਪ੍ਰੋ. ਪਿਆਰਾ ਸਿੰਘ, **ਪੰਜਾਬੀ ਵਾਰਤਕ : ਸਿਧਾਂਤ ਇਤਿਹਾਸ ਪ੍ਰਵਿਰਤੀਆਂ**, ਨਿਊ ਬੁੱਕ ਕੰਪਨੀ, ਜਲੰਧਰ।
3. ਇੰਦਰਪ੍ਰੀਤ ਸਿੰਘ ਧਾਮੀ, **ਪੰਜਾਬੀ ਰੇਖਾ ਚਿੱਤਰ : ਰੂਪ ਤੇ ਪੂਰਵਾਰਜ**, ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।
4. ਬਲਬੀਰ ਸਿੰਘ ਦਿਲ, **ਪੰਜਾਬੀ ਨਿਬੰਧ : ਸਰੂਪ, ਸਿਧਾਂਤ ਅਤੇ ਵਿਕਾਸ**, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ।
5. ਹਰਕੀਰਤ ਸਿੰਘ ਤੇ ਗਿਆਨੀ ਲਾਲ ਸਿੰਘ, **ਕਾਲਜ ਪੰਜਾਬੀ ਵਿਆਕਰਨ**, ਪੰਜਾਬ ਯੂਨੀਵਰਸਿਟੀ, ਚੰਡੀਗੜ੍ਹ।
6. ਡਾ. ਅਮਰ ਕੋਮਲ (ਸੰਪਾ.), **ਚੋਣਵੇਂ ਪੰਜਾਬੀ ਨਿਬੰਧ** (ਭੂਮਿਕਾ), ਨੈਸ਼ਨਲ ਬੁੱਕ ਟਰੱਸਟ, ਇੰਡੀਆ।
7. ਅਬਨਾਸ਼ ਕੋਰ, **ਪੰਜਾਬੀ ਰੇਖਾ ਚਿੱਤਰ**, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ।
8. ਮਿੰਨੀ ਸਲਵਾਨ, **ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਮੁੱਢਲੇ ਸੰਕਲਪ**, ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।
9. ਬੂਟਾ ਸਿੰਘ ਬਰਾੜ, **ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਸਿਧਾਂਤ ਤੇ ਵਿਹਾਰ**, ਚੇਤਨਾ ਪ੍ਰਕਾਸ਼ਨ, ਲੁਧਿਆਣਾ।

।

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SEMESTER - II
PAPER–VI : ਮੁੱਢਲੀ ਪੰਜਾਬੀ

(In lieu of Compulsory Punjabi)
(For those students who are not domicile of Punjab)

ਸਮਾਂ: 3 ਘੰਟੇ   ਕੁਲ ਅੰਕ: 50

1.   ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2.   ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ
       ਭਾਗ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3.   ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4.   ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿੱਚ ਕਰ ਸਕਦਾ
       ਹੈ।

ਪਾਠ-ਕ੍ਰਮ
ਸੈਕਸ਼ਨ-ਏ

ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਧਾਤੂ, ਵਧੇਤਰ (ਅਗੇਤਰ, ਮਧੇਤਰ, ਪਿਛੇਤਰ), ਪੰਜਾਬੀ ਕੋਸ਼ਗਤ ਸ਼ਬਦ ਅਤੇ ਵਿਆਕਰਣਿਕ ਸ਼ਬਦ

ਸੈਕਸ਼ਨ-ਬੀ

(ੳ)   ਸੰਯੁਕਤ ਸ਼ਬਦ, ਸਮਾਸੀ ਸ਼ਬਦ, ਦੋਜਾਤੀ ਸ਼ਬਦ, ਦੋਹਰੇ/ਦੁਹਰੁਕਤੀ ਸ਼ਬਦ ਅਤੇ ਮਿਸ਼ਰਤ ਸ਼ਬਦ
(ਅ)   ਸਿਖਲਾਈ ਤੇ ਅਭਿਆਸ

ਸੈਕਸ਼ਨ-ਸੀ

ਇਕ-ਵਚਨ, ਬਹੁ-ਵਚਨ, ਲਿੰਗ-ਪੁਲਿੰਗ, ਬਹੁ-ਅਰਥਕ ਸ਼ਬਦ, ਸਮਾਨ-ਅਰਥਕ ਸ਼ਬਦ, ਬਹੁਤੇ ਸ਼ਬਦਾਂ ਲਈ ਇਕ ਸ਼ਬਦ, ਸ਼ਬਦ ਜੋੜ,
ਵਿਰੋਧਾਰਥਕ ਸ਼ਬਦ।

ਸੈਕਸ਼ਨ-ਡੀ

ਨਿਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ : ਖਾਣ-ਪੀਣ, ਸਾਕਾਦਾਰੀ, ਰੁਤਾਂ, ਮਹੀਨਿਆਂ, ਗਿਣਤੀ, ਮੌਸਮ, ਮਾਰਕੀਟ/ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਧੰਦਿਆਂ ਆਦਿ
ਨਾਲ ਸੰਬੰਧਿਤ।

ਸਹਾਇਕ ਪੁਸਤਕਾਂ

1.   ਜੋਤੀ ਸ਼ਰਮਾ, **ਪੰਜਾਬੀ ਵਿਆਕਰਨ**, ਵਾਰਿਸ ਸ਼ਾਹ ਫਾਊਂਡੇਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।
2.   **ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਬੋਧ**, ਕਸਤੂਰੀ ਲਾਲ ਐਂਡ ਸੰਨਜ਼, ਅੰਮ੍ਰਿਤਸਰ।
3.   ਮਿੰਨੀ ਸਲਵਾਨ, **ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਮੁਢਲੇ ਸੰਕਲਪ**, ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ,
       ਅੰਮ੍ਰਿਤਸਰ।
4.   ਰੰਜੂ ਬਾਲਾ, **ਅਰਥ ਵਿਗਿਆਨ**, ਆਰਸੀ ਪਬਲਿਸ਼ਰਜ਼, ਦਿਲੀ।

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SEMESTER - II
PAPER–VI : Punjab History & Culture (C 320 to 1000 A.D.)
(Special Paper in lieu of Punjabi compulsory)
(For those students who are not domicile of Punjab)

Time: 3 Hours   **Max. Marks : 50**
Instructions for the Paper Setters
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION- A
1.   Alexander's Invasion and its Impact
2.   Punjab under Chandragupta Maurya and Ashoka.

SECTION- B
3.   The Kushans and their Contribution to the Punjab.
4.   The Panjab under the Gupta Empire.

SECTION- C
5.   The Punjab under the Vardhana Emperors
6.   Socio-cultural History of Punjab from 7th to 1000 A.D.

SECTION- D
7.   Development of languages and Education with Special reference to Taxila
8.   Development of Art & Architecture

Suggested Readings
1.   L. M Joshi (ed), *History and Culture of the Punjab*, Art-I, Punjabi University, Patiala, 1989 (3rd edition)
2.   L.M. Joshi and Fauja Singh (ed.), *History of Punjab* , Vol.I, Punjabi University, Patiala, 1977.
3.   Budha Parkash, *Glimpses of Ancient Punjab*, Patiala, 1983.
4.   B.N. Sharma: *Life in Northern India*, Delhi. 1966.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–II

PAPER–VII : DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION
(COMPULSORY PAPER)

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

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Section – A

Meaning of Drug Abuse:
  1) Meaning, Nature and Extent of Drug Abuse in India and Punjab.
  2) Consequences of Drug Abuse for:
     Individual   :   Education, Employment, Income.
     Family   :   Violence.
     Society   :   Crime.
     Nation   :   Law and Order problem.

Section – B

Management of Drug Abuse:
  (i)   Medical Management: Medication for treatment and to reduce withdrawal effects.
  (ii) Psychiatric Management: Counselling, Behavioural and Cognitive therapy.
  (iii) Social Management: Family, Group therapy and Environmental Intervention, Rehabilitation.

Section – C

Prevention of Drug abuse:
  (i)   Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.
  (ii) School: Counselling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students.

Section – D

Controlling Drug Abuse:
  (i)   Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program
  (ii) Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

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.
4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.
5. Kessel, Neil and Henry Walton. 1982, *Alcohalism. Harmond Worth:* Penguin Books.
6. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.
7. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
8. Ross Coomber and Others. 2013, *Key Concept in Drugs and Society.* New Delhi: Sage Publications.
9. Sain, Bhim 1991, *Drug Addiction Alcoholism,* Smoking obscenity New Delhi: Mittal Publications.
10. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab*: A Sociological Study. Amritsar: Guru Nanak Dev University.
11. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.
12. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation,* Cambridge University Press.
13. Verma, P.S. 2017, "*Punjab's Drug Problem: Contours and Characterstics",* Economic and Political Weekly, Vol. LII, No. 3, P.P. 40-43.
14. World Drug Report 2016, United Nations office of Drug and Crime.
15. World Drug Report 2017, United Nations office of Drug and Crime.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–III
Paper I : INTRODUCTION TO PYTHON

Time: 3 Hrs. **M. Marks: 75**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non–programmable & Non–storage type Calculator.

SECTION–A

Introduction to Python: Process of Computational Problem Solving, Python Programming Language
Data and Expressions: Literals, Variables and Identifiers, Operators, Expressions, Statements and Data Types

SECTION–B

Control Structures: Boolean Expressions (Conditions), Logical Operators, Selection Control, Nested conditions, Debugging
Lists: List Structures, Lists (Sequences) in Python, Iterating Over Lists (Sequences) in Python
Functions: Fundamental Concepts, Program Routines, Flow of Execution, Parameters & Arguments

SECTION–C

Iteration: While statement, Definite loops using For, Loop Patterns, Recursive Functions, Recursive Problem Solving, Iteration vs. Recursion
Dictionaries: Dictionaries and Files, Looping and dictionaries, Advanced text parsing
Files: Opening Files, Using Text Files, String Processing, Exception Handling

SECTION–D

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

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Reference Books:

1. Python for Informatics, Charles Severance, version 0.0.7

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, GUTTAG JOHN V, PHI, 2014, ISBN-13: 978-8120348660

4. Introduction to Computating & Problem Solving Through Python, Jeeva Jose andSojan 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

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–III
Paper – II : Data Structure

Time: 3 Hours   **M. Marks: 75**

Instructions for the Paper Setters: -
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

The student can use only Non–programmable & Non–storage type Calculator.

SECTION–A

Basic Data Structure: Introduction to elementary Data Organization, Common Operation on Data Structures, Algorithm Complexity, Big O Notation, Time – Space trade off between Algorithms.

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

SECTION–B

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

Stacks: Description of STACK structure, Implementation of Stack using Arrays and Linked Lists, Applications of Stacks – Converting Arithmetic expression from infix notation to polish and their subsequent evaluation, Quicksort Technique to sort an array.

SECTION–C

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

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

SECTION–D

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

Sorting and Searching: Sorting Algorithms, Bubble Sort, Searching Algorithms, Linear Search and Binary Search.

References:

1.   Seymour Lipschutz, Theory and Problems of Data Structures, Schaum's Outline Series, McGraw Hill Company.

2.   Tanenbaum, Data Structure using C.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–III
Paper – III : System Analysis & Design

Time: 3 Hours   **M. Marks: 75**

Instructions for the Paper Setters: -
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non–programmable & Non–storage type Calculator.

SECTION–A

System Planning and Analysis: Introduction to systems development life cycle and role of different stages.
Requirement analysis, Problem definition, Feasibility Study and its importance.
Information Gathering Tools, Cost Benefit Analysis, Role and Responsibilities of System Analyst.
SECTION–B

System Design: Input/Output Design, Modular and Structured Design, Tools for structured design and system design considerations.

SECTION–C

System Implementation: System testing, Quality assurance, Documentation tools, Managing system implementation.

SECTION–D

System Testing: Introduction to testing and its types
System Maintenance: Concept of maintenance and its importance, types of maintenance

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

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.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–III

Paper – IV

(Programming Lab-I)

Lab – I: **Based on Python, Programming Language**   **50 Marks**

Paper – V

(Programming Lab-II)

Lab – II: **Data Structure**   **25 Mark**

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–IV
Paper – I : Database Management System

Time: 3 Hours   **M. Marks : 75**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

The student can use only Non–programmable & Non–storage type Calculator.

SECTION–A

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.

SECTION–B

DBA, responsibilities of DBA, Relational form like INF, 2NF, 3NF, BCNF, 4th NF, 5th NF, DBTG, concurrency control and its management,

SECTION–C

Security, recovery of database.
SQL: Introduction to SQL–DDL, DML, DCL, Join methods & sub query, Union Intersection, Minus, Tree Walking, Built in Functions, Views, Security amongst users,

SECTION–D

Sequences, Indexing Cursors– Implicit & Explicit, Procedures, Functions & Packages Database Triggers.
Big Data: Introduction to Big Data and Analytics, Introduction to NoSQL

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Books and 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

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–IV
Paper – II : INTERNET APPLICATIONS

Time: 3 Hours   **M. Marks : 75**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

The student can use only Non–programmable & Non–storage type Calculator.

SECTION–A
Introduction : About internet and its working, business use of internet, services effect by internet, evaluation of Internet, Internet Service Provider (ISP) windows environment for dial up networking (connecting to internet), audio on internet, internet addressing (DNS) and IP addresses.

SECTION–B
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.

SECTION–C
Internet protocol Introduction, tile 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 FFTML, DTTML with programming techniques.

SECTION–D
Search engine: About search engine, component of search engine, working of search engine, difference between search engine and web directory.

Internet and extranet: Introduction, application of intranet, business value of intranet, working of intranet, role of extranet, working of extranet, difference between intranet and extranet.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–IV
Paper – III : JAVA & WEB DESIGNING

Time: 3 Hours   **Max. Marks: 75**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non–programmable & Non–storage type Calculator.

SECTION–A

Introduction to Concepts of Programming: Object Orientation Concepts, Platform, Independence & Cross Platform Computing.

SECTION–B

Introduction to Java: Control Statements, Operators Data Types.

SECTION–C

Introduction to OOPS: Classes & Methods, constructors, Inheritance & Polymorphism. Packages & Interfaces, Multithreading in Java, Exception Handling, String handling in Java & Input/Output in Java

SECTION–D

Introduction to Web Designing through HTML

References:

1. "Java–The Complete Reference", Hurbert Schildt, Tata MacGraw Hill.
2. "Introduction to Java Programming", Y. Daniel Mliang, Pearsons Publications.
3. "Beginning Web Programming with HTML, XHTML, and CSS", Jon Duckett, John Wiley & Sons, 06 Aug. 2004.
4. "HTML & XHTML: The Complete Reference", Thomas A. Powell, McGraw-Hill.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SEMESTER–IV
PAPER IV: WEB TECHNOLOGIES
Time: 3 Hrs.   M. Marks: 75

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION A
Introduction to websites, Static vs dynamic websites, server side and client side scripting
HTML 5 : Introduction , Structure of a web page , HTML Elements, HTML attributes, Basic Text Formatting tags, Comments, Links, Lists, Image, Style, Forms, Table, Media, Classes, iframes.
CSS3 : Introduction , stylesheets , selectors , styling – backgrounds, texts , fonts , links , lists , tables , Box model JAVASCRIPT: Introduction, datatypes, variables, comments ,Operators, functions and events, basics of JQuery and AJAX
SECTION B
Introduction to PHP, basics, Data types, variables, comments, control statements, functions, PHP with web design, working with files, uploading a file, sessions, cookies, error handling , database connectivity with mysql .

SECTION C
HOSTING : Overview of Domain , Hosting , SSL Certificates and steps to host a website online.
Introduction to Emerging Web Technologies: Introduction to Chatbot, Artificial Intelligence and Machine Learning basics used in websites.

SECTION D
EMERGING WEB TECHNOLOGIES: Basics of Internet Of Things (IOT) used in Websites, Basics of BlockChain Technology in Websites, Augmented Reality and Virtual Reality and Basics of Single page applications websites using Angular.

References:

1.   Chris Bates, "Web Programming- Building Internet Applications", Wiley India, 2006.

2.   David William Baron, The World of Scripting Languages.

3.   Programming PHP Rasmus Leadoff and Levin Tatroe O"' Reilly Publication.

4.   Steven Holzner Php: The Complete Reference 1st Edition McGraw Hill Publication.

     Achyut S Godbole and Atul Kahate, "Web Technologies", Tata McGraw Hill.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–IV

Paper – V
(Programming Lab-I)

Lab – I: **Oracle**   **50 Marks**

Paper – VI
(Programming Lab-II)

Lab – II: **HTML & Java**   **50 Marks**

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–IV
Paper VII :
ESL-221 : Environmental Studies (Compulsory Paper)

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

Exam Pattern: **End Semester Examination- 75 marks**
                          Project Report/Field Study- 25 marks [based on submitted report]
                          Total Marks- 100

Instructions for the Paper Setters:- 75 marks

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Project Report / Internal Assessment:

Field work – 25 marks [Field work equal to 5 lecture hours]
The candidate will submit a hand written field work report showing photographs, sketches, observations, perspective of any topic related to Environment or Ecosystem. The exhaustive list for project report/area of study are given just for reference:

1. Visit to a local area to document environmental assets: River / Forest/ Grassland / Hill / Mountain / Water body / Pond / Lake / Solid Waste Disposal / Water Treatment Plant / Wastewater Treatment Facility etc.
2. Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
3. Study of common plants, insects, birds
4. Study of tree in your areas with their botanical names and soil types
5. Study of birds and their nesting habits
6. Study of local pond in terms of wastewater inflow and water quality
7. Study of industrial units in your area. Name of industry, type of industry, Size (Large, Medium or small scale)
8. Study of common disease in the village and basic data from community health centre
9. Adopt any five young plants and photograph its growth
10. Analyze the Total dissolved solids of ground water samples in your area.
11. Study of Particulate Matter ($PM_{2.5}$ or PM_{10}) data from Sameer website. Download from Play store.
12. Perspective on any field on Environmental Studies with secondary data taken from Central Pollution Control Board, State Pollution Control Board, State Science & Technology Council etc.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Section A
1. The multidisciplinary nature of environmental studies
Definition, scope and importance, Need for public awareness

2. Natural Resources: Renewable and non-renewable resources:
Natural resources and associated problems.
(a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
(b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
(f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

Section B
3. Ecosystems
- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)

4. Biodiversity and its conservation
- Introduction – Definition: genetic, species and ecosystem diversity
- Biogeographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and option values
- Biodiversity at global, national and local levels
- India as a mega-diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Section C

5. Environnemental Pollution

Définition

- Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear pollution
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster management: floods, earthquake, cyclone and landslides

6. Social Issues and the Environment

- From unsustainable to sustainable development
- Urban problems and related to energy
- Water conservation, rain water harvesting, watershed management
- 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 holocaust. Case studies.
- Wasteland reclamation
- Consumerism and waste products
- Environmental Protection Act, 1986
- Air (Prevention and Control of Pollution) Act, 1981
- Water (Prevention and control of Pollution) Act, 1974
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness

Section D

7. Human Population and the Environment

- Population growth, variation among nations
- Population explosion – Family Welfare Programmes
- Environment and human health
- Human Rights
- Value Education
- HIV / AIDS
- Women and Child Welfare
- Role of Information Technology in Environment and Human Health
- Case Studies

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Field Work
- 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

Field work comprises of 5 hours of field work / visit/ assignment to be submitted by each candidate to the Teacher in-charge for evaluation latest by 1st week of before the commencement of theory exam.

ADVISORY FOR PUSHPA GUJRAL SCIENCE CITY, KAPURTHALA :

The Under Graduate students studying Environmental Studies (Compulsory Paper for All UG College Courses) may be taken to PushpaGujral Science City, Kapurthala in lieu of Field study report of 25 marks.

Although students will submit a hand written reports with pictures/ graphs/ tables related to biodiversity, ecology, health, biotechnology, energy, water etc. in about 10 pages to the teacher in-charge.

Above advisory is issued to promote scientific temperament in undergraduate classes and is optional. Further, the report will only be considered if there will be a minimum strength of 25 students along with deputed teacher by the college.

References:
1. Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press, Hyderabad.
2. Down to Earth, Centre for Science and Environment, New Delhi.
3. Heywood, V.H. &Waston, R.T. 1995. Global Biodiversity Assessment, Cambridge House, Delhi.
4. Joseph, K. &Nagendran, R. 2004. Essentials of Environmental Studies, Pearson Education (Singapore) Pte. Ltd., Delhi.
5. Kaushik, A. & Kaushik, C.P. 2004. Perspective in Environmental Studies, New Age International (P) Ltd, New Delhi.
6. Rajagopalan, R. 2011. Environmental Studies from Crisis to Cure. Oxford University Press, New Delhi.
7. Sharma, J. P., Sharma. N.K. &Yadav, N.S. 2005. Comprehensive Environmental Studies, Laxmi Publications, New Delhi.
8. Sharma, P. D. 2009. Ecology and Environment, Rastogi Publications, Meerut.
9. State of India's Environment 2018 by Centre for Sciences and Environment, New Delhi
10. Subramanian, V. 2002. A Text Book in Environmental Sciences, Narosa Publishing House, New Delhi.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–V
Paper – I : COMPUTER NETWORKS

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

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION–A
Basic concepts of Computer Networks, Client Server Network topologies.

OSI Reference Model, TCP/IP Model Comparison and Critiques, Concepts of Routers, bridges, Repeaters, Gateways.

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

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

SECTION–C
The Data link Layer: Design Issues, Error Detection and Correction, Data Link Sliding Window Protocols.
Network Layer: Design Issues, Congestion Control and Routing algorithms

SECTION–D
Presentation Layer, Design Issues, Application Layer, Concept of E-mail and Remote Login Internetworking, Network Security.

References:
1.   Tanenbaum A.S. 'Computer Network', PHI.
2.   Stalings W., 'Data and Computer Communications', PHI.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–V
Paper – II : OPERATING SYSTEM

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

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION–A

Introduction:
Definition, evolution, need, early system, function, buffering spooling, single user, multiuser, multiprogramming, multiprocessing, multitasking, multithreading, batch processing, real time, time systems, time sharing systems, security, protection.

Processor Management / CPU Scheduling:
CPU – I/O Basic Cycle, process state, process control block, Scheduling, Queue, Schedulers, Scheduling Algorithms, Performance criteria, FCFS, SJF, Priority, SRTF, Round Robin, Multi – Levels users Algorithm.

SECTION–B

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.

SECTION–C

Device Management:
I/O and device management physical characteristics, FCFS, SSTF, SCAN, CSCAN.

File Management:
Disk and File Management.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

SECTION–D

Deadlocks:
Definition, Necessary condition for deadlock, Deadlock Prevention Mutual exclusion, Hold and wait, No pre–emption, circular wait Banker's algorithms, Recovery from deadlock, semaphores.

References:

1. "Operating System Concepts", Fourth Edition by Silberschatz Galvin Addison Wesley.

2. "Operating Systems: A Design Oriented Approach" by Crowley, Published by Tata McGraw Hill.

3. "Operating Systems" Second Edition by Dietel, Addison Wesley.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–V
Paper – III : E–BUSINESS

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

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION–A

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

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

EDI:
EDI Vs Traditional Systems, EDI enabled procurement process, components of EDI system, EDI implementation issues.

SECTION–B

Concerns for E – Commerce:
Basic challenges to E – Commerce, Technological, legal and regulators heads, Internet Bandwidth & Technological Issues.

NII: Technical issues, standards & Services GII, Issues that confront us in relation to securing electronic transactions. Implementation of digital signatures. Authentication Mechanisms. Electronic cash, its elements, legal issues, risks, paper document versus Electronic document Laws for E – Commerce legal issues for Internet Commerce.

Re – Engineering for Change:
Business process re – engineering BPR, Methodology Planning Methods for change to EC / EDI.

SECTION–C

Case Studies: To demonstrate usefulness of E – Commerce in various business areas.
Banks, Reservations, E – Governance, supply – chain, Management, manufacturing, retailing and online – publishing.

SECTION–D

E – Commerce in India:

EDI service providers in India, EDI Projects in the Government regulatory agencies. The Internet in India, laws for E – Commerce in India.

Reference:

E – Commerce –   The Cutting Edge of Business.
                    Kamlesh K. Bajaj.
                    Debjani Nag.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–V
Paper – IV

Time: 3 Hours   **Max. Marks.: 50**

Practical Lab: Computer Networks

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Paper – V

Time: 3 Hours   **M.Marks: 50**

Practical Lab: Operating Systems

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–VI
Paper – I : Option (I): COMPUTER GRAPHICS

Time: 3 Hrs. **M. Marks :75**

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section. The student can use only Non–programmable & Non–storage type Calculator.

SECTION–A
Preliminaries
Basics of Computer Graphics, Computer graphics Hardware and Software.
2D Primitives
Line drawing, circle drawing and simple line clipping algorithms.

SECTION–B
2D-Transformations
Simple 2D-Transformations and their different representations, composite 2D-Transformations.
3D-Transformations
Simple 3D-Transformations, composite 3D-Transformations.

SECTION–C
Hidden Surfaces
Depth comparisons, Z-buffer algorithm, Scan line algorithms.

SECTION–D
Projections
Parallel Projections, Perspective Projections, Oblique Projections.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

References:

1. Donald Hearn & M. Pauline Baker, 'Computer Graphics', Printice Hall of India Private Limited, 2008.

2. Foley, A. Van Dam. S. Feiner, and J. Hughes, 'Computer Graphics: Principles and Practice', Addison-Wesley, 2006.

3. David F. Rogers, 'Procedural Elements for Computer Graphics', McGraw Hill Book Company, 2006.

4. Roy A. Plastick & Cordon Kalley, 'Computer Graphics', McGraw Hill Book Company, 2007.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–VI

Option I: (Paper – II)

Time: 3 Hours   **Maximum Marks: 25**

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

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–VI

Option (II): NETWORK MANAGEMENT

PAPER–I : NETWORK OPERATING SYSTEM/CLIENT–SERVER APPLICATION

Time: 3 Hours   **Maximum Marks: 75**

Instructions for the Paper Setters: -
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four
Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are
required to attempt five questions, selecting at least one question from each Section. The fifth
question may be attempted from any Section.

SECTION–A

Basic Concept: History & Evaluation of Operating System, Various View of Operating System,
Basic Concepts of Networking

SECTION–B

Fundamentals of Networking O.S.: Introduction components of various networking O.S., Case
Studies of various Network Operating System Windows 95Windows NT/Novel Netware.

SECTION–C

Fundamental of Client Server: Basics of Client Server model and its applications, Designing a
Client Server model by Creating Proxy Server,

SECTION–D

Database server and Networking O.S. Server.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

References:-

1.   MCSA/MCSE; Exam 70–291, Implementing, Managing and Maintaining a Windows Server 2003

2.   Network Infrastructure by Shinder Deborah Littlejohn, Shroff Publishers, 7th Reprint, 2005.

3.   Networking: The Complete Reference by Craig Zacker, Tata McGraw–Hill, Seventh Reprint, 2004.

4.   Unix Concepts and Applications, Sumitabha Das, Third Edition, Tata McGraw Hill, First Reprint, 2003.

5.   Unix and Shell Programming: A Text Book, Behrouz A. Forouzen, Second Reprint, PWS Publishers, 2005.

6.   Linux: A Practical Approach, B.Mohamad Ibrahim, Second Reprint, Laxmi Publications, 2006.

7.   Linux Security, Hontanon Ramon.J., BPB Publications, 2001.

8.   The Internet: Douglas E. Comer, 3rd Edition, Prentice Hall, 2003.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–VI

Option (II) : Paper – II: Practical Lab: Based on NOS

Time: 3 Hours   **Maximum Marks: 25**

Lab: Networking O.S./Client–Server Lab.

Designing of homogenous and heterogenous lab.

Creating Windows 95/NT/Novell Netware Server.

Creating of Proxy Server.

Creating of Database Server.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–VI

PAPER - I & II

Option III (PAPER- I) : FUNDAMENTALS OF CLOUD COMPUTING

Time: 3 Hrs   **Maximum Marks: 100**

Instructions for the Paper Setters: -
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION–A

Introduction: Definition, Vision, Reference Model, Benefits, Limitations, Terminology, Open Challenges.

Virtualization: Definition, Type of Virtualization, Benefits, Limitations, Virtualization and Cloud, Virtual Appliance.

SECTION–B

Cloud Computing Architecture: Service Models, Deployment Models, Cloud Entities, Cloud Clients, Service Level Agreement (SLA) and Quality of Service (QoS) in Cloud Computing.

Programming Models in Cloud: Thread Programming, Task Programming and Map–Reduce Programming.

SECTION–C

Cloud Security: Infrastructure Security, Data Security, Identity and Access Management, Privacy Management, Security as a Service on Cloud.

SECTION–D

Advance Topic in Cloud: Energy Efficiency in cloud, Market Oriented Cloud Computing, Big–Data Analytics, Federated Cloud Computing.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Textbooks:

1. Rajkumar Buyya, Christian Vecchiola and Thamarai Selvi, Mastering Cloud Computing: Foundation and Application Programming, Tata McGraw Hill, ISBN–13: 978–1–25–902995–0, New Delhi, India, Feb 2013.

2. Tim Mather, Subra Kumaraswamy, Shahed Latif, Cloud Security and Privacy, O'Reilly, ISBN–13: 978–8–18–404815–5.

Reference Books:

1. Barrie Sosinsky, Cloud Computing Bible, Wiley India Pvt. Ltd., ISBN–13: 978–8–12–652980–3, New Delhi, India, 2011.

2. Dr. Saurabh Kumar, Cloud Computing: Insights Into New–Era Infrastructure, Wiley India Pvt. Ltd, ISBN–13: 978–8–12–652883–7, New Delhi, India, 2011.

3. Fern Halper, Hurwitz, Robin Bloor, Marcia Kaufman, Cloud Computing for Dummies, Wiley India Pvt. Ltd, ISBN–13: 978–0–47–059742–2, New Delhi, India, 2011.

B.Sc. (Information Technology) (Semester System)
Syllabus for the Batch from Year 2022 to Year 2025

Semester–VI

Paper – III: PROJECT

Maximum Marks: 300

General Instructions:

1. A software module based on the work done in the entire course is to be developed.

2. The soft copy of the module shall be submitted to the College/Institute till April 30.

3. The software module shall be developed in groups, consisting of at most two students in a group.

4. The respective 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.

5. The evaluation of the module shall be done as per the common ordinance of UG/PG w.e.f. 2012-2013 under semester system.