Bachelor of Computer Applications (Semester – I)

Paper–I: INTRODUCTION TO PROGRAMMING - C

TERM-1

Introduction to C languages, features, limitations, Basic Structure, Errors, Compiling and Execution of Program

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

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.

TERM-2

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

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.

Submitted by:
NT
Asst. Prof. in Computer Science

Bachelor of Computer Applications (Semester – I)

Paper–II: INTRODUCTION TO COMPUTERS AND INFORMATION TECHNOLOGY

TERM-1

Introduction to Computers and its Applications:

- Computer as a system, basic concepts, functional units and their inter relation.
- Milestones in Hardware and Software.
- Batch oriented / on–line / real time applications.
- Application of computers.

Interacting with the Computer:

Input Devices: Keyboard, mouse, pens, touch screens, Bar Code reader, joystick, source data automation, (MICR, OMR, OCR), screen assisted data entry: portable / handheld terminals for data collection, vision input systems.

Word Processor using Microsoft Office: 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

Presentation Software using Microsoft Office: Presentation overview, entering information, Presentation creation, opening and saving presentation, inserting audio and video

TERM-2

Data Storage Devices and Media: Primary storage (Storage addresses and capacity, type of memory), Secondary storage, Magnetic storage devices and Optical Storage Devices

Output Devices: Monitor, Serial line page printers, plotters, voice response units

Spreadsheet using Microsoft Office: Spreadsheet overview, Editing, Formatting, Creating formulas, Graphs.

Submitted by:
Pooja Monga, Monika Shahi
Asst. Prof. in Computer Science

Bachelor of Computer Applications (Semester – I)

Paper III: APPLIED & DISCRETE MATHEMATICS

Term 1

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

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.

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.

Term 2

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.

Submitted by:
Neetu Vinod
Asst. Prof. in Mathematics

Bachelor of Computer Applications (Semester – I)

PAPER–V: COMMUNICATION SKILLS IN ENGLISH

TERM-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:

- Comprehension questions in multiple choice format
- Short comprehension questions based on content and development of ideas

Writing Skills: Guidelines for effective writing; writing styles for application, personal letter, official/ business letter.

- Formatting personal and business letters.
- Converting a biographical note into a sequenced resume or vice-versa
- Writing notices for circulation/ boards

TERM-2
Combination of Sentences.
Make point wise notes.

Submitted by:
Deepika Khanna
Asst. Prof. in English

Bachelor of Computer Applications (Semester – I)

PAPER–VI: ਪੰਜਾਬੀ (ਲਾਜ਼ਮੀ)

ਪਹਿਲੀ ਟਰਮ

ਆਤਮ ਅਨਾਤਮ (ਕਵਿਤਾ ਭਾਗ)
ਭਾਈ ਵੀਰ ਸਿੰਘ , ਪ੍ਰੋ: ਪੂਰਨ ਸਿੰਘ, ਪ੍ਰੋ: ਮੋਹਨ ਸਿੰਘ, ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ, ਸ਼ਿਵ ਕੁਮਾਰ ਬਟਾਵਲੀ,

ਡਾ. ਸੁਰਜੀਤ ਪਾਤਰ , ਪਾਸ਼

(ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ, ਸਾਰ)

ਇਤਿਹਾਸਕ ਯਾਦਾਂ (ਇਤਿਹਾਸਕ ਲੇਖ–ਸੰਗ੍ਰਹਿ)
(ਲੇਖ 1 ਤੋਂ 4)
(ਨਿਬੰਧ ਦਾ ਸਾਰ, ਲਿਖਣ-ਸ਼ੈਲੀ)

ਵਿਆਕਰਣ

ਪੰਜਾਬੀ ਧੁਨੀ ਵਿਉਂਤ : ਉਚਾਰਨ ਅੰਗ, ਉਚਾਰਨ ਸਥਾਨ ਤੇ ਵਿਧੀਆਂ, ਸਵਰ, ਵਿਅੰਜਨ, ਸੁਰ ਪ੍ਰਬੰਧ

ਪੈਰ੍ਹਾ ਰਚਨਾ

ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ

ਦੂਜੀ ਟਰਮ

ਆਤਮ ਅਨਾਤਮ (ਕਵਿਤਾ ਭਾਗ)
ਡਾ. ਹਰਭਜਨ ਸਿੰਘ, ਡਾ. ਜਸਵੰਤ ਸਿੰਘ ਨੇਕੀ, ਡਾ. ਜਗਤਾਰ (ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ, ਸਾਰ)

ਇਤਿਹਾਸਿਕ ਯਾਦਾਂ (ਇਤਿਹਾਸਿਕ ਲੇਖ- ਸੰਗ੍ਰਹਿ) (ਲੇਖ 5 ਤੇ 6)

(ਨਿਬੰਧ ਦਾ ਸਾਰ, ਲਿਖਣ ਸ਼ੈਲੀ)

ਵਿਆਕਰਣ: ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ : ਭਾਸ਼ਾ ਦਾ ਟਕਸਾਲੀ ਰੂਪ, ਭਾਸ਼ਾ ਤੇ ਉਪਭਾਸ਼ਾ ਦਾ ਅੰਤਰ , ਪੰਜਾਬੀ ਉਪਭਾਸ਼ਾਵਾਂ ਦੇ ਪੱਛਾਣ ਚਿੰਨ, ਪੈਰ੍ਹਾ ਰਚਨਾ, ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ ।

Submitted by:
Harpreet Kaur
Asst. Prof. in Punjabi

Bachelor of Computer Applications (Semester – I)

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

PROBLEM OF DRUG ABUSE

TERM-1

Meaning of Drug Abuse:

Meaning, Nature and Extent of Drug Abuse in India and Punjab.

Consequences of Drug Abuse for:

Individual	:	Education, Employment, Income.
Family	:	Violence.
Society	:	Crime.
Nation	:	Law and Order problem.

Management of Drug Abuse:

Medical Management: Medication for treatment and to reduce withdrawal effects.

TERM-2

Psychiatric Management: Counselling, Behavioural and Cognitive therapy.

Social Management: Family, Group therapy and Environmental Intervention.

Submitted by:
Rupinder Kaur
Asst. Prof. in Environmental Studies

Bachelor of Computer Applications (Semester – III)

Paper – I: COMPUTER ARCHITECTURE

TERM-1

Information Representation : Register Transfer, Various Registers, Implementing Common Bus Using Multiplexers: Logical; Arithmetic & Shift Micro – operations.

Basic Computer Design : Instruction Codes, Interfacing various Registers, Computer Instructions, Timing Signals, Instruction Cycle, Design of a Basic Computer.

CPU Design Stack Organized CPU, Instruction Formats, Addressing Modes, Program Control, Hardwired & Microprogrammed (Wilhe's Design) Control Unit.

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

TERM-2

I/O Organization I/O Interface, Modes of Transfer, Program Interrupt, DMA & I/O Processor.

Pipeline & Vector Processing Parallel Processing Pipelining, Parallel & Distributed Computers, SISD, SIMD & MISD, MIMD Machines, Vector Processing.

Submitted by:
Kawaljit Kaur
Asst. Prof. in Computer Science

Bachelor of Computer Applications (Semester – III)

Paper – II: DATABASE MANAGEMENT SYSTEM

TERM-1

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, SQL: Introduction to SQL–DDL, DML, DCL, Join methods & sub query, Union Intersection, Minus, Tree Walking, Built in Functions, Views, Security amongst users, DBA, responsibilities of DBA, Relational form like INF, 2NF, 3NF, BCNF, 4^{th} NF, 5^{th} NF, DBTG, concurrency control and its management, protection, security, recovery of database.

TERM-2

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

Submitted by:
Ashmeet Kaur
Asst. Prof. in Computer Science

Bachelor of Computer Applications (Semester – III)

Paper III: INTRODUCTION TO PYTHON PROGRAMMING

TERM-1

Introduction to Python: Python's Technical Strengths, Execution Model, Process of Computational Problem Solving, Different ways to run Python Programs.

Data and Expressions: Literals, Variables and Identifiers, Operators, Expressions, Strings, Statements and Data Types, Boolean Expressions (Conditions), Logical Operators, Selection Control, Nested conditions, Debugging

Lists: List Structures, Lists (Sequences) in Python, Iterating Over Lists (Sequences) in Python.

Control Structures: Conditional blocks using if, else and elif,While statement, Definite loops using For, Loop Patterns

Functions, Packages: Fundamental Concepts, Program Routines, Flow of Execution, Parameters &Arguments, Recursive Functions, Recursive Problem Solving, Iteration vs. Recursion

TERM-2

Dictionaries: Dictionaries and Files, Looping and dictionaries, Advanced text parsing

Modules: Understanding Packages, Modules, Top-Down Design, Python Modules Importing own module as well as external modules and packages.

Files: Opening Files, Using Text Files, Reading files, Writing files, Understanding read functions, read(), readline() and readlines(), Understanding write functions, write() and writelines(), Manipulating file pointer using seek, String Processing, Exception Handling

Objects and Their Use: Introduction to Object Oriented Programming, Concept of class, object and instances, Constructor, class attributes and destructors, Real time use of class in live projects, Inheritance, overlapping and overloading operators, Adding and retrieving dynamic attributes of classes, Programming using Oops support

Using Databases and SQL: Database Concepts, SQL basic summary, SQL Database connection using python, creating and searching tables, Programming using database connections, Basic Data modelling, Programming with multiple tables

Submitted by:
Isha Arora
Asst. Prof. in Computer Science

Bachelor of Computer Applications (Semester – V)

Paper – III: OPERATING SYSTEM

TERM-1

1. **Introduction**: Definition, Early Systems, Simple Batch system, Multi programmed Batch. Time Sharing Systems, Personal Computer System, Parallel Systems, Distributed Systems, Real–time Systems.
2. **Processes**: Process concepts, Process Scheduling, Threads.
3. **CPU–Scheduling**: Basic concepts, Scheduling Criteria, Scheduling Algorithms, Algorithm Evaluation.
4. **Process Synchronization**: Critical – section problem, semaphores, classical problem of synchronization.
5. **Secondary Storage Structures**: Disk structures, Disk scheduling, Disk Reliability.
6. **Deadlocks**: System Model, Deadlock characterization, methods for handing deadlocks, Deadlocks Prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock, combined approach to deadlock handling.

TERM-2

7. **Memory Management**: Background, Logical v/s Physical address space, swapping, continuous allocation, paging, segmentation.
8. **Virtual Memory**: Background, demand paging, performance of demand paging, page replacement, page replacement algorithms, allocation of frames, thrashing.

Submitted by:
Monika Shahi
Asst. Prof. in Computer Science

Bachelor of Computer Applications (Semester – V)

Paper II: WEB TECHNOLOGIES

TERM-1

- Web Essentials, Markup languages, CSS
- Basics of Client side programming, Java script language, java script objects, host objects, Browsers and DOM
- Basics of Server side programming, Java servlets
- ASP/JSP, Basics of ASP/JSP objects, simple ASP and JSP pages
- Representing Web data, Data base connectivity, JDBC

TERM-2

- Introduction to PHP, basics, PHP File handling, file upload, cookies, error handling, PHP MySQL introduction
- Middleware technologies, Ecommerce architecture and technologies, Ajax, Advanced web technologies and tools
- **Case Studies:** PHP and MySQL case studies.

Submitted by:
Isha Arora
Asst. Prof. in Computer Science

Bachelor of Computer Applications (Semester – V)

Paper – I: COMPUTER NETWORKS

TERM-1

1. **Introduction:** Network Definition, Basic Components of a Network, Network types and topologies, Uses of Computer Networks, Network Architecture.
   Transmission Media: Coaxial cable, twisted pair cable, fibre optics & satellites. OSI reference model, TCP/IP reference model, comparison of OSI and TCP reference model.

2. Transmission & Switching: Multiplexing, circuit switching, packet switching, hybrid switching, ISDN service transmission.

3. **Data Link Layer Design Issues:** Services provided to Network layer framing, error control, flow control, link management. Error detection & correction, Elementary Datalink Protocols.

4. **Design Issues of Network Layer:** Services provided to transport layer, routing, connection, internet & World Wide Web.

5. **Network Services:** File transfer, Access & Management, Electronic Mail, Remote login

TERM-2

6. **Introduction to Analog and Digital Transmission:** Telephone system, Modems, Types of modems, pulse code modulation.

7. **Local Area Network Protocols:** CSMA Protocols, BRAP, MLMA, IEEE standards 802, Token Bus, Token Ring, FDDI.

8. **Network Security and Privacy:** Brief Introduction to Cryptography.

Submitted by:
Kawaljit Kaur
Asst. Prof. in Computer Science

Bachelor of Computer Applications (Semester – V)

Paper – IV: JAVA PROGRAMMING LANGUAGE

TERM-1

Introduction to JAVA: Object Orientation Concepts, Platform Independence & Cross Platform Computing, Control statements, Operators & Data types.
Classes & Methods, constructors, Inheritance & Polymorphism.

TERM-2

Packages & Interfaces, Multithreading in Java.
Exception Handling, String handling in Java & Input/Output in Java.

Submitted by:
Ashmeet Kaur
Asst. Prof. in Computer Science