



Scheme of Instructions & Syllabi

of

**Bachelor of Science (Honors)
in Computer Science
First Year Syllabus
(Effective from session 2020-21)**

Department of Computer Applications

**INVERTIS UNIVERSITY
Bareilly-243123 U.P.**

STUDY AND EVALUATION SCHEME

B. Sc. (Honors) in Computer Science

(Effective from session 2020-2021)

SEMESTER I, YEAR I

Course Code	Course Title	Course Category	L+T+P	CA	EE	Total	Credit
CSH101	Computer Fundamentals	CC1	5+1+0	50	100	150	6
CSH102	Programming using C	CC2	3+1+0	30	70	100	4
CSH103	Digital Electronics and Applications	CC3	3+1+0	30	70	100	4
CSH105	Industrial Applications	AECC	2+0+0	15	35	50	2
LAB							
CSH151	C Programming Lab	CC2(P)	0+0+4	15	35	50	2
CSH152	Digital Electronics Lab	CC3(P)	0+0+4	15	35	50	2
	Total			155	345	500	20

SEMESTER II, YEAR I

Course Code	Course Title	Course Category	L+T+P	CA	EE	Total	Credit
CSH**	GE1	GE	2+0+0	15	35	50	2
CSH204	Data Structures using C	CC4	3+1+0	30	70	100	4
CSH205	Operating Systems	CC5	5+1+0	50	100	150	6
CSH206	Programming in C++	CC6	3+1+0	30	70	100	4
LAB							
CSH252	Data Structures Lab	CC4P	0+0+4	15	35	50	2
CSH253	C++ LAB	CC6P	0+0+4	15	35	50	2
	Total			155	345	500	22

CSH 101: Computer Fundamentals

Teaching Scheme

Lectures: 3 hrs/Week

Tutorials: 1 hr/Week

Credits: 4

Examination Scheme

Class Test -12Marks

Teachers Assessment - 6Marks

Attendance – 12 Marks

End Semester Exam – 70 marks

Pre-requisites: Fundamentals of IT and Computer Language

Course Objectives:

1. Define the computer, generations ,classification and basic concepts of computer
2. To discussed and solve the binary number and codes like BCD EBDIC
3. Describe the important computer system resources and the role of operating system in their management policies and algorithms
4. Introduction to MS words and various functions and how to work
5. Introduction to MS excel and various elementary functions using tools
6. To add basic objects and design elements to presentations

Detailed Syllabus

Unit-1

Introduction to Computer Fundamentals: Introduction to Computer , Block Diagram of Computer, Generation of Computers, Classifications of computers, Computer Memory, Input and Output Devices. Computer Virus, Types of Viruses, Computer languages: Machine, Assembly and High level language, Assembler, Compiler and interpreter, Algorithms and flow chart.

Unit-2

Number System: Number System: Binary, Octal, Decimal, and Hexadecimal representation of Characters: ASCII and EBDIC codes.

Unit-3

Basics of Operating System: Definition of Operating System, Functions of Operating Systems Working with Windows Operating System: Introduction, The Desktop, Structure of Windows, Windows Explorer, File and Folder Operations, The Search, The Recycle Bin, Configuring the Screen, Adding or Removing New Programs using Control Panel, Applications in windows (Paint, Notepad, WordPad, Calculator), Comparison of DOS and Windows, Basic DOS Commands..

Unit-4

MS-Office: Introduction to MS-Office and its integrated nature-MS-Word: Starting Word, new documents, entering text, changing text, aligning, underlining, and justifying text. Tables – creation, adding rows and columns, splitting, and combining cells, Borders. Saving, closing, and operating documents, Adding headers and footers.

Unit-5

MS-Excel: Introduction, Starting MS-Excel, Basics of Spreadsheet, MS-Excel Screen and Its Components, Elementary Working with MS-Excel.

Unit-6

MS-Power Point: Introduction, Starting MS-PowerPoint, Basic concept of presentation software. Standard toolbar, formatting toolbar, and drawing toolbars in Power Point and their use. Creating and opening a

presentation. Use of slide sorter, adding header/footer. Use of animation features. Inserting pictures, resizing pictures. Inserting organization chart. Use of auto content wizard.

Text and Reference Books

1. Computer Fundamentals, P.K. Sinha, BPB Publication, November, 2004.
2. Computer Fundamental and Concepts, V. Raja Raman, PHI, 4 th Edition, January 2010.
3. Go! With Microsoft Office 2010, Shelly Gaskin et.al., Volume 1, 2nd Edition

Course Outcomes:

1. Bridge the fundamental concepts of computers with the present level of knowledge of the students
2. To understand binary, Octal, Hexadecimal and their Arithmetic
3. To understand the main components of an OS & their functions
4. Students will create documents that demonstrate proficiency in the use of word processing,
5. Students will create documents that demonstrate proficiency in the use of Spreadsheets,
6. Students will create documents that demonstrate proficiency in the use of presentation applications.

CSH 102: Programming Using C

Teaching Scheme	Examination Scheme
Lectures: 3 hrs/Week Tutorials: 1 hr/Week Credits: 4	Class Test -12Marks Teachers Assessment - 6Marks Attendance – 12 Marks End Semester Exam – 70 marks

Prerequisite: - Boolean Algebra, Number System and basic mathematical formulas

Course Objectives:

1. To develop the programming skills of students
2. To know the principles of designing structured programs
3. To write basic C programs using
 - i) Selection statements
 - ii) Repetitive statements
 - iii) Functions
 - iv) Pointers
 - v) Arrays
 - vi) String
 - vii) File handling

Detailed Syllabus

UNIT I (8 Hours)

Introduction & Basic Concepts of 'C' Programming Language: History of 'C' Programming, Assembly language, Machine Language, Editors, Translators (Compiler, Interpreter, Assembler), Programming Rules, Algorithm, Flowcharts, Structure of C program, Executing the C program. C Character Set, C Keywords/Reserve words, Identifiers, Rules to form an Identifier, Variables, Constants, Types of Constant(Numeric, Character, String, Symbolic), Comments in C, Data types in C, Operators- Types of operators(Arithmetic, Relational, Logical, Unary, Assignment, Compound Assignment, sizeof(), Conditional/Ternary, Bitwise) , Precedence and Associativity, Comments, Concept of header files, Types of problems(Sequential, Selective & Repetitive).

UNIT II (10 Hours)

Introductions to Control structures: Control statements- if, if-else, if-else ladder, Nesting of if, break, continue, Switch statement, use of break and default with switch, goto, exit. Program Loops and Iteration: Loops/Iteration, types of loops, for, Nesting of for, while, do-while. Difference b/w while & do-while, break & exit, break & continue.

UNIT III (10 Hours)

Array, Structure and Union: Introductions to Arrays, Structures and Union: Array (Definition, Declaration, Initialization, characteristics), How to store values in an array, How to display values stored in an array, Sorting (Selection, Bubble, Insertion), Searching (Linear, Binary), Multidimensional arrays (Definition, Declaration, and Initialization), Pointers and arrays, Pointer and 2-d arrays, Pointer to an array, Array of Pointers, Dynamic memory allocation. Structure, Structure declaration, Declaration & Initialization of structure variable how to store values in a structure, how to access values of structure

elements, Nesting of structures, Array of structure, Differentiate between array & structure, passing structure to function, passing array of structure to function, Structure pointer, Union

UNIT IV (10 Hours)

Functions and Macros: Function (Declaration, Definition, Calling), Function Prototype, types of function, return statement, function calling methods (Call by value, call by Reference), Storage Classes, Recursion. Macro, Macro Declaration, nesting of macros, Macros with argument, Diff between macro & function.

UNIT V (8 Hours)

Strings: Strings-Definition, declaration and initialization of strings, standard library functions: strlen(), strcpy(), strcat(), strcmp(), etc. Pointer and Strings, Two Dimensional array of characters, Array of Pointers to String.

UNIT VI (10 Hours)

File Handling: File, File operations, Opening and Closing Files, File opening modes, Reading and Writing a data file, Text files Vs Binary files, Command Line Arguments(argc,argv), sprintf() & scanf(), gets() & puts(), fgetc() & fputc(), fseek() & ftell().

Text and Reference Books

1. Rajaraman V. Fundamental of Computers
2. Ram B. Computer Fundamentals, New Age International
3. Kerninghan B.W. & Ritchie D.M. - The C Programming Language
4. Gottfried - Programming with C Schaum
5. Kanetkar Y. - Let us C
6. Balaguruswamy - Programming in C

Course Outcomes:

1. Understanding the concept and recognize the basic terminology used in computer programming.
2. Write, Compile and Debug programs in C language and use different data types for writing the programs.
3. Design programs connecting decision structures, loops and functions.
4. Understand normal and abnormal combustion phenomena in SI and CI engines
5. Understand the dynamic behavior of memory by the use of pointers
6. Use different data structures and create / manipulate basic data files and developing applications for real world problems.

CSH 103: Digital Electronics and Applications

Teaching Scheme

Lectures: 3 hrs/Week

Tutorials: 1 hr/Week

Credits: 4

Examination Scheme

Class Test -12Marks

Teachers Assessment - 6Marks

Attendance – 12 Marks

End Semester Exam – 70 marks

Prerequisite: - Basic knowledge of Physics of 10+2 standard.

Course Objectives:

1. To describe various types of Number System, basic electronic components and hardware components of computer system.
2. To understand the concept of Boolean algebra, types of digital circuits, memories, addressing modes and I/O interface.
3. To solve problems related to number system conversions and calculation of binary codes.
4. To implement basic Boolean expressions using different Digital Electronic device.
5. To distinguish between types of digital circuit.
6. To design digital circuits for a particular functions using basic electronic components.

Detailed Syllabus

UNIT 1

Introduction- Digital versus Analog Signals, Electrical versus Electronics.

Number System and Codes - Concept of number system bases – binary, octal, decimal and hexadecimal number systems and conversion between each, BCD, Excess-3, Gray Code, and Weighted Codes.

UNIT- II

Binary Arithmetic- Binary Addition and Subtraction. Complements and Subtraction using complements, Multiplication.

Boolean Algebra- Truth table, Boolean operators and precedence, Boolean laws, De-Morgan's Theorem, Principle of Duality, SOP and POS, Conversion from SOP to POS and vice versa, Canonical and standard forms. Reduction of expressions using Boolean laws and K-Map.

UNIT- III

Logic Gates- Primary and Secondary Logic Gates, Designing of circuits using gates, Universal Gates, Implementation of circuits using NAND and NOR.

UNIT- IV

Combinational Circuits- Half and Full Adder/Subtractor, Look-Ahead Carry Adder, Multiplexer, Demultiplexer, Encoder, Decoder and code-converter. Implementation using MUX and decoder.

UNIT- V

Sequential Circuits- Latch, Flip-flop, Edge triggered flip-flop, RS flip-flop, J-K flip-flop D-type flip-flop, T flip-flop Excitation table and characteristic equation of flip-flops, Counters.

UNIT- VI

Memory- General Memory Operation, ROM, RAM (Static and Dynamic), PROM, EPROM, EEPROM.

Text and Reference Books

1. Digital Logic & computer Design, M. Morris Mano, PHI, 2004.
2. Computer System Architecture, M. Morris Mano, PHI, 2004.
3. Computer Organization, Hamachar, Vranesic, McGrawHill, 5th Edition.
4. Computer Organization & Architecture, W. Stallings, PHI, 6th Edition.

Course Outcomes:

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|---|
| 1. Differentiate between analog and digital circuits as well as electrical and electronics. |
| 2. Perform number system conversion. |
| 3. Find solution of binary arithmetic problem and understand Boolean algebra. |
| 4. Implement any given Boolean expression using MUX, Decoder as well as Logic Gates. |
| 5. Discrimination among various kind of memory devices with their need. |

CSH 105: Industrial Applications

Teaching Scheme	Examination Scheme
Lectures: 3 hrs/Week Tutorials: 1 hr/Week Credits: 4	Presentation – 15 Marks Viva-Voce- 15 Marks Unit test-20 Marks End Semester Exam – 50 marks

Prerequisite: - English Grammar of 10+2 standard.

Course Objectives:

The objectives of this course are:

1. To understand the concepts, process and importance of communication.
2. To equip students with Oral and written communication skills.
3. To enhance their communication skills in real life situations.
4. To develop awareness regarding appropriate communication strategies.
5. To encourage students by developing their critical thinking through activities.
6. To assist students with employability and job search skills.

Detailed Syllabus

Unit-1 Communication Skills: Verbal, Non-Verbal, Listening Skills, Writing Skills, Questioning Skills Business Etiquette: Making the First Impression, Importance of Handshakes, Business Card Etiquette, Grooming and Personal Hygiene, Body Language, Telephone and email Etiquette
Unit-2 Presentation Skills: Fundamentals of an Effective Presentation, 5 P's of an Effective Presentation, Importance of Visual Aids, Understanding and Overcoming Fear, Public Speaking, Importance of Managing Voice and Language, Managing Question and Answer Session
Unit-3 Goal Setting: Establishing SMART Goals, Importance of Mission Statement, Formulation of Goals, Procrastination, Visualization of Goals Time Management: Prioritization, Dealing with Difficult Tasks, Getting Organized, How to get away from Distractions, Work-Life Balance
Unit-4 Conflict Management: Creating a Win-Win situation, Negotiation and Persuasion, Dealing with Aggressive Behaviour, Different Styles of Handling Conflicts, Dealing with Emotions, Conflict Resolution Strategies, Tools and Techniques for Conflict Management

Unit-5

Interpersonal and Team Skills: Initiating Small Talks, Managing Relationships, Understanding the Cultural Diversity, Teambuilding Process and Techniques, Coordination in Teams, Assertive Communication while Dealing with Teams, Balancing Team Needs and Individual Needs, Importance of Feedback in Team Building

Unit-6

Facing Interview: Preparing to face interviews, Group Discussion, Resume Building, Body language, Grooming & Dressing. Role of Attitude: Positive mental attitude, Career Planning, Stress management, Anger management

Text and Reference Books

1. Business Communication, Bovee & Thill, McGraw Hill, fifth edition, 2007.
2. Business Communication, Raymond V. Lesikar, McGraw Hill, 7th edition, 2009.
3. Business Communication Strategies, Matthukutty Monippally, Tata McGraw Hill.
4. An Anthology of English Essays, edited by R.P Singh, Oxford University Press.
5. An Anthology of English short Stories, edited by R.P Singh.
6. A Remedial Course in English for colleges, Central Institute of English and Foreign Languages, Book 1, Book 2, Book 3.
7. Soft Skills, Dr.K.Alex, S.Chand 8. Basic English Usage, Michael Swan, Oxford Indian Edition.

Course Outcomes:

After completing the course, students will be able to:

1. Understand the process of communication and its effect on giving and receiving information.
2. Demonstrate his/her ability to speak or write error free while making an optimum use of correct business vocabulary and grammar.
3. Apply effective communication skills in a variety of public and interpersonal settings.
4. To draft effective correspondence with brevity and clarity.
5. Demonstrate his verbal and nonverbal communication ability through presentations
6. Become aware the numerous carrier opportunities within the fields of communication.