DEPARTMENT OF INFORMATION TECHNOLOGY
KUMAUN UNIVERSITY, NAINITAL

SEMESTER-I (2016-17)

Scheme and syllabus for B.A./B. Sc. (Information Technology)

Semester system course structure:

1. *The course work shall be divided into six semesters with three papers in each semester.*
2. *Each paper in a semester will be of **80 marks** out of which **60 marks** for theory and **20 marks** are allotted for internal assessment (written test or assignments or both)*
3. *Each theory paper shall consists of **section A:** 20% of total marks (12 marks; one question of 12 parts; multiple choice, one word/one sentence answer, fill in the blanks, true- false; all parts will be compulsory), **section B:** 40% of total marks (24 marks, one question of 06 parts; any 04 have to be attempted with short answer) and **section C**: 40% of total marks; (24 marks, 04 questions, any two have to be attempted with long answer).*
4. *Question paper shall cover the whole syllabus.*
5. *Practical in each semester will be of total **60 marks**, out of which **15 marks** are assigned for internal assessment (attendance, practical records etc.).*
6. *Practical examination will be evaluated by both external and internal examiner.*

SEMESTER-I		**Internal**	**External**	**Total**
PAPER I-FUNDAMENTALS OF IT		**20**	**60**	**80**
PAPER II- OFFICE AUTOMATION		**20**	**60**	**80**
PAPER III-PRINCIPLES OF PROGRAMMING LANGUAGE		**20**	**60**	**80**
Practical		**15**	**45**	**60**
TOTAL MARKS:				**300**
SEMESTER -II				
PAPER I- COMPUTER ORGANIZATION & ARCHITECTURE		**20**	**60**	**80**
PAPER II- PROGRAMMING THROUGH 'C'		**20**	**60**	**140**
PAPER III- BASICS OF COMPUTER NETWORKS		**20**	**60**	**80**
Practical		**15**	**45**	**60**
TOTAL MARKS:				**300**

PAPER I-FUNDAMENTALS OF IT

Unit-I General concepts:

Information concepts and computer appreciation, Defining IT, Information Systems, Data and Information, Representation of Information, Elements of electronic data processing, Types of processing. Block structure of a computer, Characteristics of computers and Problem solving with computers.

Unit-II Classification of computers:

On the basis of capacity, purpose, and generations, Computer languages: Machine language, Assembly language, High level language, 4GL.

Unit-III Input and Output Units:

Keyboard, Mouse, Monitor (CRT and LCD), Light pen, Joystick, Mouse, Touch screen, OCR, OMR and MICR
Plotters and Types of Printers: Impact, non-impact, working mechanism of Drum printer, Dot Matrix printer, Inkjet printer and Laser printer.

Unit-IV Overview of storage devices:

Floppy disk, Hard disk, Compact disk and Tape
Memory Types: Magnetic core, RAM, ROM, Secondary, Cache, Bubble Memory.
Introduction: Compiler, Interpreter, Assembler, System Software and Application Software.

Suggested Books:

1. “Computers Today”, D. H. Sanders, Fourth Edition, McGraw Hill, 1988.
2. “Fundamentals of Computers”, V. Rajaraman, Second Edition, Prentice Hall of India,New Delhi, 1996.
3. “Information Technology”, Satish Jain, Paperback Edition, BPB 1999.
4. “Information Technology Inside and Outside”, David Cyganski, John A. Orr, Paperback Edition, Pearson Education 2002.
5. “Computer Fundamentals”, B. Ram, Third Edition, Wiley, 1997.
6. "Fundamentals of Information Technology”, Chetan Srivastva, Third edition, Kalayani Publishers
7. Computers, Larry long & Nancy long, Twelfth edition, Prentice Hall

Paper II- Office Automation

Unit-I DOS and Windows Environment:

DOS organization, DOS commands, Operating System: Batch, multi-programming, Time sharing, Networks operating system, On-line and Real time operating system, Distributed operating system, Multi-processor, Multi-tasking.
Graphical OS: Fundamentals of windows, Types of windows, Anatomy of windows, Windows explorer, Customizing windows, Control panel, Taskbar setting, Open Network and sharing centre.

Unit-II Word Processor:

Applications of word processor, Common packages, Creating and saving documents, Editing documents, Formatting text and paragraphs, Use of header footer, Insert table, Edit table, Mail merge, Macros.

Unit-III Spread Sheet:

Concept of worksheets and workbooks, Creating workbook, Editing a work sheet, Formatting data, Doing basic calculations using formulae, Using simple statistical functions, Inserting charts, Printing workbook.

Unit-IV Power Point:

Templates, Views, Formatting slide, Slides with graphs, Animation, using special features, presenting slide shows.

Suggested 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.
5. Fundamental of Computers – By V. Rajaraman B.P.B. Publications

Paper III-Principles of Programming Language

Unit-I

Importance of programming languages, Brief history and features, Attributes of good programming language, Procedure oriented programming, Object oriented programming, Programming process, Program tools, Introduction to language translator.

Unit-II

Elementary and structured data types, their specification, representations and implementation of numbers, vectors and arrays, records, data structures

Unit-III

Implicit and Explicit sequence control, Subprogram sequence control, Recursive sub programs, Exception and exception handlers, Co-routines and scheduled subprograms, Task and concurrent exceptions.

Unit-IV

Name and reference environments, static, Dynamic and Block Structures, Parameters and their transmission, Task and shared data storage requirement for major runtime elements, Program and system controlled storage management.

Practical for Semester-I

Objective and Expected Outcome:
The main objective is use make students familiarize with basic DOS commands and use all available popular packages that help in making a office system fully automated.

1. Familiarizing with pc and windows commands.
2. File creation.
3. Editing.
4. Directory creation.
5. Mastery of DOS Internal & External commands.
6. Learning to use MS office: MS word, MS excel & MS PowerPoint.

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SEMESTER-II (2016-17)

Paper I- Computer Organization and Architecture

Unit-I Processing Unit:

Von Neumann Architecture, Concept of CPU, Control Unit, Arithmetic and Logic Unit, Instruction Set, General Register Organization, Stack Organization, Instruction Format, Addressing Modes, Data Transfer and Manipulation, RISC,CISC.

Unit-II Input-Output Organization:

Input-Output Interface, Asynchronous Data Transfer, Modes of Transfer, Direct Memory Access, Input-Output Processor.

Unit-III Memory Types and Organization:

Magnetic core, RAM, ROM, Secondary, Cache and Bubble Memory. Memory Hierarchy, Associative Memory, Cache Memory, Virtual Memory

Unit-IV Representation of Data:

Digital versus analog, Concept of number system, Binary, Octal, Decimal, Hexadecimal numbers, Conversion from one form to another, Fractional numbers, Signed numbers, Complements. Binary Arithmetic: Addition, subtraction and multiplication.

Suggested Books:

1. Digital Computer Electronics, Malvino, Second Edition, Mc-Graw Hill
2. Modern Digital Electronics, R. P. Jain, Fourth Edition, TMH
3. Digital Logic & Computer Design, D. Morris Mano, Second Edition, PHI
4. Digital and Electronic Circuits, T. C. Bartee, McGraw Hill
1. Computer System Architecture, M.M. Mano, Third Edition, PHI
2. Computer Organization and Architecture, J.P. Hayes, Third Edition, TMH
3. Computer Organization and Architecture, Stallings, Eighth Edition, PHI

Paper II- Programming through 'C'

Unit-I C-Fundamentals:

Character set, Identifiers and keywords, Data types, Constants, Variables and Arrays, Declarations, Operator and Expressions, Library functions, Statements, Symbolic constants, Preprocessor directives, Formatted input, Output, Basic data types, Type conversion, Data type modifiers, Expressions and Operators, Precedence of c operators.

Unit- II Control Structures:

Introduction, Decision making with if – statement, if-else and nested if, while and do-while, for loop. Jump statements: break, continue, goto, switch Statement

Unit III Functions & Arrays:

Introduction to Functions, Function Declaration, Function Categories,
Standard Functions, Parameters and Parameter Passing, Call – by value/reference, Recursion, Global and Local Variables, Storage classes.
Arrays: Introduction to Arrays, Array Declaration, Single and Multidimensional Array,

Unit-IV Structure, Union and Pointers:

Declaration of structure, Accessing structure members, Structure Initialization, Arrays of structure, nested structures, Unions.
Pointers: Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers, Pointers and Arrays

Suggested Books:

1. Let us C, Yashvant P Kanetkar, Seventh Edition, BPB Publications, New Delhi.
2. Programming in ANSI C, E. Balagurusami, Fourth Edition, Tata McGraw Hill
3. Programming in C, Byron S. Gottfried, Second Edition, McGraw Hills.
4. The C Programming Language, Kernighan & Richie, Second Edition, PHI Publication
5. Object Oriented Programming, Lafore R, Third Edition, Galgotia Publications
6. Problem Solving and Programming in C, R. S. Salaria, Second Edition

Paper III- Basics of Computer Networks

Unit-I Computer Communication:

Concept of communication, Data communication, Data transmission, Types of signals in communication, Methods and modes of data transfer, Simplex, Half duplex and Full duplex.

Unit-II Networks:

Network components, Network topologies, Switching techniques, Three layers of networking components (application software, network software, network hardware) and ISO model.

Unit-III Types of networks:

LAN, WAN, MAN, VAN, types of LAN, LAN implementation, LAN topologies, LAN devices (repeater, hub, bridges, routers, gateways).

Unit-IV TCP/IP and Internetworking:

Examples of TCP/IP operations, related protocols, IP address structure, major features of IP, IP datagram, Major IP services, Importance of transport layer, TCP, Major features of TCP, Route discovery protocol, Examples of root discovery protocols, Ipv6.

Suggested Books:

1. Computer Networks, Tanenbaum, Andrew, Fifth Edition, PHI
2. Data Communication and Networking, Behrouz A. Forouzan, Fourth Edition
3. Data Communication System, Black, Ulysse, Third Edition, PHI
4. Data and Computer Communications, Stalling, Ninth Edition, PHI

Practical for Semester-II

Objective and Expected Outcome:
The objective of this course is to help the students in making programs to counter real life problems using C language (structured programming).

1. Keywords and Identifiers: introduction, purpose
2. Variables and constants: data types, Initialization, declaration, scope, memory limits
3. Input-output statements: formatted and non-formatted statements
4. Operators: Arithmetic, logical, conditional, assignment, bitwise, increment/decrement operators
5. Decision Making: switch, if-else, nested if, else-if ladder, break, continue, goto
6. Loops: while, do-while, for
7. Functions: definition, declaration, variable scope, parameterized functions, return statement, call by value and call by reference, recursive functions
8. Pre-processor Directives: Pre-processor directives like INCLUDE, IFDEF, DEFINE, etc
9. Header Files: STDIO.H, MATH.H, STRING.H, PROCESS.H etc
10. Arrays: Array declarations, Single and multi-dimensional, memory limits, strings and string functions
11. Pointers: Pointer declarations, pointer to function, pointer to array/string.