UNIVERSITY OF KOTA, KOTA

B.SC.COMPUTER SCIENCE Exam -2016-17

Eligibility: 10+2 in Science or Mathematics with 40% marks
Selection: Based on Merit in qualifying examination.

1. Scheme of Instruction:

Each year shall be of ten months (150 working days) duration. Details of lecture hours per week shall be as follows:

Theory: Three hours/week for each Paper

Practical: Students are required to work in the Laboratory for 4 hours per week for each practical under faculty guidance.

2. Examination Scheme:

1. University shall conduct examinations only after completion of 150 working days of instruction in a year.
2. Each theory paper shall be of 100 marks (75 marks for written examination of 3 hrs duration and 25 marks for internal assessment).
3. Each practical paper shall be of 100 marks.
4. The internal marks will be awarded by committee consisting of Head of the Department & the faculty concerned.
5. The student have to pass internal and external exam separately theory as well as practical papers.

Theory:

1. **Assignments:** 40% of the internal assessment marks for each theory paper will be awarded on the basis of performance in the assignments regularly given to the students, and its records.
2. **Internal Examination:** 40% of the total Internal Assessment marks for each theory paper will be awarded on the basis of performance in written examination conducted by the faculty, one at the end of fourth month and another at the end of eighth month.
3. **Seminar/Oral examination:** 10% of the total internal assessment marks for each paper will be awarded on the basis of performance either in a seminar or internal viva-voce.
4. **Overall performance:** 10% of the total internal assessment marks will be awarded for each paper on the basis of performance and conduct in the classroom.

Practical :

1. **Project**: 80% of the total Internal Assessment Marks for each practical paper during I & II year will be awarded on the basis of project, its presentation and project report submitted by the students. This activity can be held in the team of maximum two students. There should be a project co-ordinator (faculty member of computer science department).
2. **Internal examination:** 10 % of the total Internal Assessment marks for each practical paper during I & II year will be awarded on the basis of performance in practical examination conducted by the faculty, once during the session. In III year it will be 80%.
3. **Overall performance:** 10 % of the total internal assessment marks will be awarded during I & II year for each practical paper on the basis of performance and conduct of the student in the practical lab. In III year it will be 20%.

Note: Detailed breakup of Internal Marks awarded as per above guidelines must be submitted to the university in a tabular format for each paper. Department/College must preserve answer books of internal examination for a period one year from the date of examination and must be presented to the university as and when required.

(a) **I division with distinction:** 75% or more marks in the aggregate provided the candidate has passed all the papers and examinations in the first attempt.
(b) **I division :** 60% or more marks but fails to satisfy the criteria for being classified as first division with distinction laid in (a).
(c) **II division :** All other than those included in (a) and (b) above i.e. $< 60\%$ and $\geq 45\%$.
(d) Passing criteria is as per university ordinance. A candidate must pass the examinations within five years of the initial admission to the first year of the course.

B.Sc (Computer Science)

Pt-I Examination- 2016-17

Courses of Study and Examination :

Paper	Paper Name	Lecture	Duration of exam. (hours)	Max. Marks		Total
				University Exam.	Internal Assessment	
BCS-101	Introduction to Information Technology	3	3	75	25	100
BCS-102	Basic Mathematics	3	3	75	25	100
BCS-103	Problem Solving through C Programming	3	3	75	25	100
BCS-104	Database Management System	3	3	75	25	100
BCS-105	Digital Electronics	3	3	75	25	100
	Practical					
BCS-106	DBMS Lab	4(2+2)	3	75	25	100
BCS-107	Programming Lab in C	4(2+2)	3	75	25	100
	TOTAL			**525**	**175**	**700**

***for each practical paper students have to submit the project/file.**

B.Sc (Computer Science)
Pt-II Examination- 2017-18

1. Courses of Study and Examination

Paper	Paper Name	Lecture	Duration of exam. (hours)	Max. Marks		Total
				University Exam.	Internal Assessment	
BCS-201	Computer Oriented Statistical Method	3	3	75	25	100
BCS-202	Computer Organization	3	3	75	25	100
BCS-203	Fundamentals of Operating Systems	3	3	75	25	100
BCS-204	Web Technology	3	3	75	25	100
BCS-205	Data Structure	3	3	75	25	100
	Practical					
BCS-206	Data Structure Lab	4(2+2)	3	75	25	100
BCS-207	Web Technology Lab	4(2+2)	3	75	25	100
	TOTAL			525	175	700

***for each practical paper students have to submit the project/file**

B.Sc (Computer Science)
Pt-III Examination- 2018-19

1. Courses of Study and Examination

Paper	Paper Name	Lecture	Duration of exam. (hours)	Max. Marks		Total
				University Exam.	Internal Assessment	
BCS-301	Systems Software	3	3	75	25	100
BCS-302	Visual Programming	3	3	75	25	100
BCS-303	Unix Programming	3	3	75	25	100
BCS-304	Data Communication and Networking	3	3	75	25	100
BCS-305	Software Engineering	3	3	75	25	100
	Practical					
BCS-306	Visual Programming Lab	4(2+2)	3	75	25	100
BCS-307	Unix Lab	4(2+2)	3	75	25	100
	TOTAL			525	175	700

***for each practical paper students have to submit the project/file**

Pt-I Examination- 2016-17
BCS - 101: Introduction to Information Technology

Time: 3 Hrs Max.Marks: 75

UNIT - I

Computer Basics: Algorithms, A Simple Model of a Computer, Characteristics of Computers, Problem-solving Using Computers.

Data Representation: Representation of Characters in computers, Representation of Integers, Representation of Fractions, Hexadecimal Representation of Numbers, Decimal to Binary Conversion, Error-detecting codes.

Input & Output Devices: Description of Computer Input Units, Other Input Methods, Computer Output Units.

UNIT - II

Computer Memory: Memory Cell, Memory Organization, Read Only Memory, Serial Access Memory, Physical Devices Used to Construct Memories, Magnetic Hard Disk, floppy Disk Drives, Compact Disk Read Only Memory, Magnetic Tape Drives.

Processor: Structure of Instructions, Description of a Processor, A Machine Language Program, An Algorithm to Simulate the Hypothetical computer.

UNIT - III

Binary Arithmetic: Binary Addition, Binary Subtraction, Signed Numbers, Two's Complement Representation of Numbers, Addition/Subtraction of Numbers in 2's Complement Notation, Binary Multiplication, Binary Division, Floating Point Representation of Numbers, Arithmetic Operations with Normalized Floating Point Numbers.

Computer Architecture: Interconnection of Units, Processor to Memory communication, I/O to Processor Communication, Interrupt Structures, Multiprogramming, Processor Features, Reduced Instruction Set Computers (RISC), Virtual Memory.

UNIT-IV

Software Concepts: Types of Software, Software Its Qualities & Attributes, Programming Languages (Its types and differences)

Operating Systems: Definition, O.S. functions and O.S. types : brief introduction. A Brief History of Linux, MS-DOS, Windows Operating System.

UNIT - V

Computer Generation & Classifications: First, Second, Third, Fourth and Fifth Generation, Classification of computers, Concept of Distributed and parallel computers.

Internet: Network, World Wide Web, Uniform Resource Locator, Web Browsers, IP Address, Domain Name, Internet Services Providers, Introduction to Internet Security, Internet Requirements, Web Search Engine, Net Surfing, Internet Services, Intranet and Extranet.

Text / Reference Books

1. P.K.Sinha "Introduction to Information Technology",
2. V. Rajaraman, Fundamentals of Computers, 3rd Edition, PHI Publications
3. Nasib S. Gill, Essentials of Computer & Network Technology, Khanna Publications.
4. Deepak Bharihoke, Fundamentals of Information Technology, Excel Books.

BCS - 102: Basic Mathematics

Time: 3 Hrs Max.Marks: 75

UNIT - I

Number Systems, LCD & GCD, Fibonacci numbers, Sequences and series : AP, GP and HP, Sum of n terms, arithmetic–geometric- harmonic means between two numbers (excluding arithmetic- geometric series). Logarithms : definition, Laws regarding product, quotient, exponent and change of base.

UNIT – II

SETS: Sets, subsets, equal sets, null set, universal set, finite & infinite sets, open & closed sets etc., operations on sets, partition of sets, Cartesian product.

UNIT - III

RELATIONS AND FUNCTIONS : relation, properties of relations, equivalence relation, equivalence relation with partition , partial order relation, maximal and minimal points, pigeonhole principle, function, domain and range, onto, into and one-to-one functions, composite functions, inverse functions, introduction of algebraic, trigonometrically, logarithmic, exponential, hyperbolic functions, zeros of functions.

UNIT – IV

DIFFERENTIATION: Derivative, derivatives of sum, differences, product & quotients, derivatives of composite functions, logarithmic differentiation, mean value theorem, expansion of functions, (Maclaurin's & Taylor's.), indeterminate forms, L'Hospitals rule, maxima & minima, concavity, asymptote, singular points, curve tracing, successive differentiation & Leibnitz theorem.

UNIT - V

Basic concepts of Graph Theory : Verties, edges, degree, paths, circuits, cycles, complete graphs and trees. Multi-graphs, weighted graphs and directed graphs, Adjacency matrix of a graphs. Connected and disconnected graphs.

Permutations (Simple and under restrictions), combinations (selections with and without replacement).

Text / Reference Books

1. C. L. Liu.: Elements of Discrete Mathematics, Tata Mac-Graw Hill.
2. Thomas, G.B. and R. L. Finney: Calculus & Analytical Geometry, Addison-Wesley, 9^{th} edition.
3. Chandrika Prasad : Mathematics for Engineers, Prasad Mudranalaya, Allahabad, 19^{th} edition
4. Shanti Narayan: Differential Calculus, S. Chand & Co.
5. Shanti Narayan: Integral Calculus, S. Chand & Co.

BCS -103: Problem Solving through C Programming

Time: 3 Hrs Max.Marks: 75

UNIT- I

Algorithm and algorithm development: Definition and properties of algorithm, flow chart symbols, example of simple algorithms. Program design, errors: syntax error and semantic error, debugging, program verification, testing, documentation and maintenance.

Variable names, data type and sizes, constants, declarations, arithmetic operators, relational and logical operators, type conversions, increment and decrement operators, bitwise operators, assignment operators and expressions, precedence and order of evaluation, standard input and output statements.

UNIT- II

Control Flow: Statements and blocks, if-else, nested if, switch, looping statement: while, for, do-while, break and continue, go-to and labels.

Arrays : declarations, integer and character array, reading and writing an array, one and two dimensional array, operations on arrays.

UNIT – III

Functions and Program Structure: Basics of function, function definition and declaration, external variables, scope rules, header files, static variables, register variables, block structure, initialization, recursion, the C preprocessor.

Pointer : Pointers and addresses, pointers and function arguments, address arithmetic. Character pointers, pointers to pointers, Pointers to functions.

UNIT - IV

Structures: Basics of structures, structures and functions, arrays of structures, pointers to structures, self-referential structures, type-def, unions.

UNIT - V

File Handling: access methods , different file operations and functions, concept of text & Binary files, file I/O, command line argument, Formatted file input and output.

Text / Reference Books

1. Deendayalu R., Computer science Volume I and II, Second Edition,Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. Rajaraman V., Fundamentals of computers, Second Edition, Prentice Hall of India Private Limited, New Delhi.
3. Let as C by Y. Kautka, BPB Publication.
4. Programing with C, Balaguruswamy, Tata McGraw-Hill.

BCS 104: Database Management System

Time: 3 Hrs Max.Marks: 75

Unit –I

Introduction : Purpose of the data base system, data abstraction, data model, data independence, data definition language, data manipulation language, data base administrator, data base users, overall structure.

Unit –II

ER Model : entities, mapping constrains, keys, E-R diagram, reduction E-R diagrams to tables, generation, aggregation, design of an E-R database scheme.

Unit –III

Relational Model : The catalog, base tables and views. Relational Data Objects - Domains and Relations: Domains, relations, kinds of relations, relations and predicates, relational databases.

Relational Data Integrity - Candidate keys and related matters: Candidate keys. Primary and alternate keys. Foreign keys, foreign key rules, nulls. Candidate keys and nulls, foreign key and nulls.

Unit –IV

The SQL Language: Data definition, retrieval and update operations. Table expressions, conditional expressions, embedded SQL, Loins.
Views: Introduction, what are views for, data definition, data manipulation, SQL support.

Unit –V

File and system structure : overall system structure, file organisation, logical and physical file organization, sequential and random, hierarchical, inverted, multi list, indexing and hashing, B-tree index files.

Text / Reference Books

1. Date C.J., Database Systems, Addision Wesley.

2. Korth, Database Systems Concepts, McGraw Hill.

BCS -105 Digital Electronics

Time: 3 Hrs Max.Marks: 75

UNIT- I

Number Systems: Binary, octal, decimal, hexadecimal and BCD number systems. Representation of positive, negative integers and real numbers. Characters digital codes: ASCII and EBCDIC coding, binary arithmetic in 1's and 2's complement.

UNIT-II

Boolean Algebra: Logic gates, truth table, logic expression, rules and laws of Boolean algebra. Demorgan's theorems, simplification of boolean expression using Karnaugh map (upto 4 variables).

UNIT- III

Combinational Circuits: Adder, subtractor, comparator, decoder, encoder, multiplexer, de-multiplexer. (Block diagram level only)

UNIT- IV

Flip Flops: Latches, edge-triggered flip flops, pulse triggered flip flop, R-S flip, JK master-slave flip flop, D flip flop, T flip flop. Shift register, shift left, shift right, Bidirectional

UNIT- V

Memory Organization: Basic memory cell, 1- 2-D memory, row and column address, accessing memory, different RAM and ROM types, Magnetic bubble memory, charged couple device.

Text / Reference Books

1. Thomas L. Floyd, Digital Fundamentals, United Book Stall New Delhi.
2. Mano M.M., Digital Logic and Computer Design, Prentice Hall of India, Pvt Ltd. New Delhi.
3. Hayes J.P., Computer Organization and Architecture, Tata Mc-Graw Hill Publishing Company Ltd. New Delhi.
4. Mano M.M., Computer System Architecture, Prentice Hall of India Private Limited New Delhi.

Pt - II Examination- 2017-18

BCS -201- Computer Oriented Statistical Method

Time: 3 Hrs Max.Marks: 75

Unit I

Introduction to Statistics: meaning, scope of statistics, collection and classification of data.

Unit II

Application based on and processing logic of measures of central tendency, dispersion, skewness and kurtosis.

Unit III

Bivariate Data: Correlation - Meaning types of correlation, Karl Pearson's Correlation and rank correlation, properties of correlation coefficients.

Unit IV

Linear Regression: Processing logic and numerical based of fitting of regression lines (using least square method).

Unit V

Various properties related to regression coefficients.

Text / Reference Books

1. Gupta S.C. Kapoor, V.K., "Elements of Mathematical Statistics", S. Chand & Sons.
2. S.C. Gupta, "Fundamentals of Mathematical statistics", PIII, 1991
3. Bala Guruswamy, "Computers oriented Statistical Methods", S.Chand, 1990
4. S.P. Gupta, "Fundamentals of Statistics", S.Chand 1993.
5. M.R. Speigel, "Statistics", Schaum Series, McGraw-Hill, 1981.

BCS- 202 Computer Organization

Time: 3 Hrs Max.Marks: 75

UNIT- I

Basic Computer Organization: Instruction codes, direct and indirect address, timing and control signal generation, instruction execution cycle, memory reference instructions, input output instructions.

Register Transfer and Micro Operations: Bus and memory transfers, three state bus buffers, binary adder, binary incrementer, arithmetic circuit, and logic and shift micro operations, ALU.

UNIT- II

Central Processing Unit: General register organization, memory stack, one address, two address instructions, data transfer, arithmetic, logical and shift instructions, software and hardware interrupts (only brief introduction), arithmetic and instruction pipelines.

UNIT- III

Computer Arithmetic: Addition and subtraction with signed magnitude data, multiplication algorithms, hardware algorithm and booth algorithm, division algorithm.

UNIT - IV

Input Output Organization: Asynchronous data transfer- handshaking, asynchronous serial transfer, interrupt initiated I/O, DMA transfer, interfacing, peripherals with CPU (introduction), keyboard, mouse, printer, scanner, network card.

UNIT- V

Memory Organization: ROM, RAM, hard disk, CD-ROM, Cache memory- direct mapping scheme, virtual memory concept.

Suggested Book

1. Computer System Architecture, Mano M., Pearson Education.
2. Complete System Architecture by J.P. Heys, PHI

BCS 203: Fundamentals of Operating Systems

Time: 3 Hrs Max.Marks: 75

Unit – I

Introduction: Definition of an operating system, Mainframe, desktop, single user & multi user OS distributed, real-time and handheld OS.

Unit – II

Operating System Structures: System components, operating system services, system calls, systems programs, system structure, virtual machines.
Process Management: criteria, scheduling algorithms, algorithm evaluation.
Process Synchronization: The critical section problem, semaphores, classical problems of synchronization.

Unit – IV

Memory Management: Swapping, contiguous memory allocation, paging, segmentation, segmentation with paging.

Unit – V

Virtual Memory: Demand paging, page replacement, allocation of frames, thrashing.

Text / Reference Books

1. Operating System Concepts, Silberschatz G.G., John Wiley & Sons Inc.
2. Operating System Concepts, Galvin, Addion Wesley.
3. Operating System, Ritchie, BPB Publications.

BCS 204: Web Technology

Time: 3 Hrs Max.Marks: 75

Unit – I

Introduction to Basics of Internet

Concepts of Internet : Domain, IP Addressing, Resolving Domain Names, Overview of TCP/IP and its Services, WWW.

Unit – II

Designing Pages with HTML

Introduction to HTML, Essential Tags, Deprecated Tags, Tags and Attributes, Text Styles and Text Arrangements, Text, Effects, Exposure to Various Tags (DIV, MARQUEE, NOBR, DFN, HR, LISTING, Comment, IMG), Color and Background of Web Pages, Lists and their Types, Attributes of Image Tag,

Unit – III

Hypertext, Hyperlink and Hypermedia, Links, Anchors and URLs, concept of navigation, Different Section of a Page and Graphics, Footnote and e-Mailing, Creating Table, Frame, Form and Style Sheet.

Unit – IV

DHTML

Dynamic HTML, Document Object Model, Features of DHTML, CSSP (Cascading Style Sheet Positioning) and JSSS (JavaScript assisted Style Sheet), Layers of Netscape, The ID Attribute, DHTML Events.

Unit – V

Web Designing Tools

Front Page Basics , Web Terminologies, Phases of Planning and Building Web Sites, The FTP, HTTP and WPP, Features, Front Page Views, Adding Pictures, Backgrounds, Links, Relating Front Page to DHTML.

Text / Reference Books

1. HTML Black Book – Steven Holzner – Dreamtech Press
2. HTML, Java Script, DHTML, PERL, CGI – Evan Bayross – BPB
3. Web Programing, Kris James, Frank, Bris & Co.
4. Principles of Web Design, Joel Sklar, Vikas Publication.

BCS 205: Data Structure

Time: 3 Hrs Max.Marks: 75

Unit I

Introduction: structure and problem solving, algorithmic notation, Data Structure, Algorithms and sub algorithms, introduction to algorithm analysis for time and space

Unit II

Primitive and non primitive data structure concept, representation and manipulation of strings, concept and terminology for non primitive data structure, concept of arrays, stacks, queues. Basic operations on arrays, stacks & queues.

Unit III

Linear data structures and their linked storage representation: pointers and linked allocation, linked linear list, singly linked list, application of linked linear lists.

Unit IV

Non Linear data structure: Trees, types of trees, Graphs and their representations, applications of graph.

Unit V

Sorting and searching: concept of sorting and searching , selection sort, bubble sort, merge sort, binary search

Text / Reference Books

1. An Introduction to Data Structures with Applications, Tremblay & Sorensons, Tata Mcgraw hills publications.
2. Data structure and algorithms, Aho., Alfred V., Pearson Education.
3. Fundamentals of Data structure in C, Horowitz, Ellis, Galgotia publication.

Pt – III Examination- 2018-19

BCS 301: Systems Software

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

Unit – I

Language processors - Language processing activities and fundamentals - Language specification - Development Tools - Data Structures for Language processing- Scanners and Parsers.

Unit – II

Assemblers: Elements of Assembly language programming - Overview of the Assembly process - Design of a Tow-pass Assembler - A single pass Assembler for the IBM PC.

Unit – III

Macros and Macro processors - Macro definition, call, and expansion - Nested macro calls - Advanced macro facilities - Design of a macro preprocessor - Compilers: Aspects of compilation.

Unit – IV

Compilers and Interpreters - Memory allocation Compilation of Expressions and Control structures - Code optimization - Interpreters.

Unit – V

Linkers : Linking and Relocation concepts - Design of a linker - Self relocating Programs - A linker for MS DOS - Linking for over-lays - loaders Software tools: Software tools for program development - Editors - Debug monitors - Programming environments - User interfaces.

Text / Reference Books

1. L.L. Beck, "System Software, An Introduction to System Programming", Addison-Wesley, 1985.
2. D.M. Dhamdhere, Systems Programming and Operating Systems, Second Revised Edition, Tata McGrawhill Publ. Company 1999.

BCS 302: Visual Programming

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

UNIT – I

Client Server Basics: Discover Client-Server and Other Computing Architectures, Understand File Server Versus Client-Server Database Deployment, Learn About the Two Tier Versus Three Tire Client-Server Model, Visual Basic Building Blocks and Default Controls: Forms, Using Controls, Exploring Properties, Methods and Events, Introduction To Intrinsic Controls, Working With Text, Working With Choices, Special Purpose Controls, VB Advance Controls: Events, Menu bar, Popup Menus, Tool bar, Message Box, Input Box, Built-in Dialog Boxes, Creating MDI, Working with Menus

UNIT – II

VB Programming Fundamentals And Variables: Introduction to Variables, Variable Declaration, Arrays, Introduction to Constants and Option Explicit Statement, Assignment Statements, Working With Math Operations, Strings, Formatting Functions, Controlling and Managing Program: All Control Statements, Loops, Error Trapping, Working With Procedures, Functions, Controlling How Your Program Starts, Common controls and control arrays: Introduction to common controls- Tree view, list view, tab strip, Creating and working with control arrays.

UNIT –III

Visual Basic and databases: Understanding the Data Controls and Bound Controls, Introduction to Data Form Wizard, Introduce DAO, Working With Record sets, Record Pointer, Filters, Indexes, Sorts And Manipulation of Records. Remote and ActiveX Data Objects: Working With ODBC, Remote Data Objects and Remote data Control, Introducing ADO, ADO Data Control

UNIT – IV

Using Data Grid Control and ActiveX Data Objects. ActiveX Controls, Extending ActiveX Controls and Classes: Creating, Testing, Compiling, Enhancing and User Drawn ActiveX Controls, Using ActiveX Control Interface Wizard and Property Pages Wizard, Introducing Ambient, Extender Objects, Creating Property Pages, Building Class Modules, ActiveX DLL.

UNIT – V

Client-Server Development Tools: COM, Services Models, Development Tools Included with VB 6, Working With SourceSafe Projects. Reports and Packaging: Data Reports and Crystal Reports, Packaging A Standard EXE Project, VB And Internet: Introduction to VBScript, Tools used with VBScript and VBScript Languages, Introduction to Active Server Pages, ASP Objects.

Text / Reference Books

1. Gary Cornell - Visual Basic 6 from the Ground up - Tata McGraw Hill - 1999.
2. Noel Jerke - Visual Basic 6 (The Complete Reference) - Tata McGraw Hill - 1999.

BCS 303: Unix Programming

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

Unit – I

INTRODUCTION:

File and common commands - Shell - More about files - Directories- Unix system - Basics of file Directories and filenames - Permissions - modes - Directory hierarchy - Devices - the grep family - Other filters - the stream editor sed - the awk pattern scanning and processing language - files and good filters.

Unit – II

CONCEPTS OF SHELL:

Command line structure - Metacharacters - Creating new commands - Command arguments and parameters - program output as arguments - Shell variables - More on I/O redirection - loop in shell programs - Bundle - Setting shell attributes, Shift command line parameters - Exiting a command or the shell, evaluating arguments - Executing command without invoking a new process - Trapping exit codes -- Conditional expressions.

Unit – III

SHELL PROGRAMMING:

Customizing the cal command, Functions of command, While and Until loops - Traps - Catching interrupts - Replacing a file - Overwrite - Zap - Pick command - News command - Get and Put tracking file changes.

Unit – IV

FEATURES IN UNIX:

Standard input and output - Program arguments - file access - A screen at a time printer - On bugs and debugging - Examples - Zap - pick - Interactive file comparison program - Accessing the environment - Unix system calls - Low level I/O, File system Directories and modes, Processors, Signal and Interrupts.

Unit – V

PROGRAM DEVELOPMENT AND DOCUMENT PREPARATION:

Program development - Four function calculator - Variables and error recovery - Arbitrary variable names, Built in functions, Compilation into a machine, Control flow and relational operators, Functions and procedures - Performance evaluation - Ms macro package - Troff level - Tbl and eqn preprocessors - Manual page - Other document preparation.

Text / Reference Books

1. Brian W. Kernighan, Rob Pike - The UNIX Programming Environment - Prentice Hall of India(1984).
2. Steven Earhart - The UNIX System for MSDOS Users - Galgotia book source P. Ltd. (1990).
3. Stefen Prata - Advanced UNIX - A Programmer Guide.

BCS 304 : Data Communication and Networking

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

Unit - I

Components of a data communication system, model of a data communication, data transmission concepts, digital and analog transmission, serial/parallel data transmission, signal encoding techniques, modulation and modems.

Unit - II

Guided and unguided transmission media, Transmission impairments, channel capacity, baud rate, bandwidth, multiplexing techniques, synchronous and asynchronous transmission, simplex, half duples and full duplex transmission.

Unit - III

Circuit switching, Packet switching and Message switching , Connection oriented and Connection less services, Computer Networks Protocols and Standards, Local area networks, Types of LAN (star, Ethernet, bus, FDDI), LAN Technology(IEEE 802.3, 802.4, 802.5), wide area networks.

Unit – IV

ISO-OSI model of networking, different layers and their functions, Networking and Internetworking, Services gateways, bridges, repeaters, routers, Introduction to ISDN, DSL and cable TV modem.

Unit - V

Introduction to Internet applications like DNS, FTP, SMTP, SNMP, WWW, HTTP, URL, E-mail, Teleconferencing & Electronic Banking, Network Security and privacy, Awareness of Indian Networks-NIC NET,ERNET etc, introduction to mobile computing, impact of social engineering sites.

Text / Reference Books

1. Behrouz and Forouzan - Introduction to Data Communication and Networking - 2nd Edition - TMH – 2001.
2. Stallings W. Data and Computer Communications, Pearson Educations.
3. Jean Wairand - Communication Networks (A first Course) - Second Edition - WCB/ McGraw Hill - 1998.
4. S. Tannanbauim, Computer Networks, Pearson Educations.

BCS 305 Software Engineering

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

UNIT – I

Introduction to Software Engineering: Definition, size, factors - Quality and Productivity Factors - Managerial Issues - Planning a software project: Defining the problem - Developing a Solution Strategy - Planning the Development Process - Planning an Organization structure - Other Planning Activities.

UNIT – II

Software Cost Estimation: Software cost factors - Software Cost Estimation Techniques - Staffing-level Estimation - Estimating Software Maintenance Costs - The Software Requirements Specification - Formal Specification Techniques - Languages and Processors for Requirements Specification.

UNIT – III

Software design: Fundamental Design Concepts - Modules and Modularization Criteria - Design Notations - Design Techniques - Detailed Design Considerations - Real-Time and Distributed System Design - Test Plans - Milestones, walkthroughs, and Inspections.

UNIT - IV

Implementation issues: Structured Coding Techniques - Coding Style - Standards and Guidelines - documentation guidelines -Type Checking - Scoping Rules - Concurrency Mechanisms.

UNIT - V

Quality Assurance - Walkthroughs and Inspections - Static Analysis - Symbolic Execution - Unit Testing and Debugging - System Testing - Formal Verification: Enhancing Maintainability during Development - Managerial Aspects of Software Maintenance - Source Code Metrics - Other Maintenance Tools and Techniques.

Text / Reference Books

1. R.Fairley, Software Engineering Concepts, Tata McGraw-Hill Edn. 1997.
2. R.S. Pressman, Software Engineering, Fourth Ed., McGraw Hill, 1997.
3. Software Engineering, Sumunvilley, Pearson Publication.

Innovations and Employability in the area of Computer Science

Innovations

Computer Science is the most creative and diverse field of all the technology fields. If you can imagine an outcome, this major will provide you the tools to create it. In addition to providing a solid grounding in all the most significant areas of computer science, The syllabus is designed for students considering their individual needs, who want to study a broad computer science curriculum with an emphasis on combining both the theory and practice of computer science. Then the syllabus will be able to develop computer professionals with a good grasp of how to design and build high quality systems for industry that are usable in real world socio-technical contexts.

The overall aim to develop this syllabus of Computer Science course is to deliver a broad but rigorous Computer Science education coupled with direct exposure to cutting edge research. Graduates and Post Graduate of this programme are intended to continue directly into careers involving innovative thinking and problem solving, as part of an advanced research, development or other applied field of computer science.

Employability

Selection to study the Computer Science opens up many avenues for future career prospects.
Almost every major challenge in the world turns to the use of computer science to solve problems; from medical research, education, supporting aid work in disaster areas, helping to create a sustainable environment, the logistics of moving products around the world, to the world of business and securing and managing the vast levels of data through visualisation, security and transmission; not to mention the world of media.

Being a successful Computer professional is not just about solving technical problems, but also collaboration, leadership, and teamwork; which is why our degree courses encourage you to gain these interdisciplinary and interpersonal skills in addition too.

- Computers and computing technology lies at the heart of organisations across all industrial sectors; and our graduates are equipped to support and develop these systems.
- Computer Technology is the fastest developing technology in the world, and the requirement for graduates with the skills to work in this field is continuing to grow, whilst the actual supply of graduates with the skills is dropping worldwide.

Computer Science will fulfill the growing market demand in government and private sectors both for expertise in following:

Databases

Communication Networking

Image processing

Animation

Software development ..... etc

JOB OPPORTUNITIES FOR POSTGRADUATE STUDENTS

A. [BCA/B.Sc. (CS/IT)/BA/BSc./B.Com (with Computer)/PGDCA] graduate can work as a

1. Computer Operator/Computer
2. Informatic Assistant etc. In a government sector
3. BDP, Desktop Publishing, BPO professionals
4. Low-level Web designers, Graphic designers
5. Data entry operators
6. Technical Assistant