School of Computer Sciences
Bachelor of Science (Computer Science)

1. Structure:

Course Code	Course Title	Credits	Marks Distribution		
			Spot Assignment (Internal)	Term End Exam (External)	Total
FIRST YEAR:					
BFTM 11	Tamil [or] any one of the other languages	6	25	75	100
BFEG 11	English Language	6	25	75	100
BCM-01	Mathematics	4	25	75	100
BSCS-04	Introduction to Computer Organisation	4	25	75	100
BSCS-05	'C' Programming and Data Structures	4	25	75	100
BSCS-06	Visual Basic Programming	4	25	75	100
BSCS- P1	*Lab 1: 'C' & VB Programming*	*4*	*25*	*75*	*100*
SECOND YEAR:					
BSCS-07	Applied Operations Research	6	25	75	100
BSCS-08	Design and Analysis of Algorithms	6	25	75	100
BSCS-09	Object Oriented Programming with C++	4	25	75	100
BSCS-10	Introduction to Database Management Systems	4	25	75	100
	Elective I *	4	25	75	100
CCE	Environmental Studies	*4*	25	75	100
BSCS-P2	*Lab 2: C++ Programming & RDBMS*	*4*	25	75	100
THIRD YEAR:					
BSCS-15	Data Communications and	4	25	75	100

	Networking				
BSCS-16	Introduction to Operating Systems	4	25	75	100
BSCS-17	Java Programming	4	25	75	100
BSCS-18	HTML & Web Design	4	25	75	100
BSCS-19	Introduction to Software Engineering	4	25	75	100
	Elective II **	4	25	75	100
BSCS-P3	*Lab 3: Java Programming*	*4*	*25*	*75*	*100*
BSCS-P4	Project Work	4	-	100	100
ELECTIVE I:					
BSCS-11	Accounting and Financial Management	4	25	75	100
BSCS-12	Management Information Systems	4	25	75	100
BSCS-13	Principles of Management	4	25	75	100
BSCS-14	Managing Information Technology	4	25	75	100
ELECTIVE II:					
BSCS-20	Network Security	4	25	75	100
BSCS-21	Software Testing	4	25	75	100
BSCS-22	Compiler Design	4	25	75	100
BSCS-23	TCP/IP Programming	4	25	75	100
BSCS-24	Intranet Administration	4	25	75	100

* Students are advised to choose any one Elective Course from list of Elective I
** Students are advised to choose any one Elective Course from List of Elective II

FIRST YEAR

BCM - 01: Mathematics

Block 1: Theory of equations – imaginary roots rational roots – Relation between the roots and coefficients of equations – symmetric function of the roots – sum of the power of the roots of an equation – Newton's Theorem. Transformation of equations: Roots multiplied by a given number – reciprocal roots – reciprocal equations – standard forms to increase and decrease the roots of a given equation by a given quantity – Removal of terms.

Block 2: Solutions of algebraic equations – bisection, Iteration method – Newton – Raphson method – Method of False Position. Solutions of simultaneous linear equations: Gauss's method – Gauss Jordan method – Iteration method – Gauss's Seidal method.

Block 3: Set, Relations and Functions: Sets – Notation and description of sets – subsets – operations on sets – Properties of set operations – Relations: Representation of a relation – Operations on Relations – Equivalence Relation Partitions and Equivalence Classes. Functions: Definition – One to one – Onto functions – Special type of functions – Invertible and composition of functions.

Block 4: Finite Automata and Languages: Languages: Alphabet, Strings, Operations, Regular Expression: Operation, Non-deterministic Finite Automata – Deterministic Finite Automata.

References Books:
1. Introduction to Methods of Numerical Analysis, S.S. Sastry, Prentice Hall of India, 1994.
2. Algebra, T.K. Manicavasagam Pillai, T. Natarajan and K.S. Ganapathy, S. Viswanathan Pvt Ltd, 1996.
3. Discrete mathematical structures with applications to Computer Science, J.P.Tremblay and R.Manohar, Tata McGraw Hill, 1997.

BSCS-04: Introduction to Computer Organization

Block-1: Data Representation: Introduction – The Von Neumann Architecture – Generation of Computers – Data Representation: Decimal – Alphanumeric – Fixed – Decimal Fixed – Floating point – Error Detection and Correction codes – Instruction Execution. Digital Logic Circuits – Introduction – Boolean Algebra – Logic Gates – Combinational Circuits – Sequential Circuits – Inter connection structures.

Block-2: Peripheral Devices: Memory Organization: Introduction – various memory devices – Types of Random Access Memory – Types of Auxiliary memory – High Speed Memories : Cache Memory – Interleaved Memory – Associated Memory. IO Organization: I/O Model – I/O Techniques – DMA – I/O processes – External Interface.

Block-3: Instruction Set: Introduction – Characteristics – Addressing Modes – Instruction format – Examples. Registers organization: Structure of CPU – Register Organization – Micro operation – ALU Organisation – Control Unit Organisation – Microprogrammed Control Unit – Microinstruction: sequencing – Microinstruction Execution.

Block–4: Microprocessor and Assembly Language Programming : Introduction – Microcomputer architecture – CPU components – Instruction set – Introduction to Motorola 68000 microprocessor – Assembly Language : Introduction – Assembly language fundamentals – I/O services – Assembly language program development tools – Examples : COM programs – EXE programs – Simple assembly language programs – Programming with loops and strings – Arrays – Modular program – Interface to high level program – Interrupts.

Reference Books:

1. Computer System Architecture, Mano M.Morris, Prentice Hall of India, Third edition, (1983)
2. Microprocessors and Interfacing – Programming and Hardware, Doughlas V.Hall, McGraw Hill, 1986

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BSCS-05: 'C' Programming and Data Structures

Block 1: Introduction to C programming language – Data types – Identifiers – Variable declaration – Enumerated data types – typedef statement – Operators : Arithmetic – relational – logical – cast – increment – decrement – bitwise – precedence of operations – expressions – decision structures : goto – if – Escape sequences – Structure of C program.

Block 2: Control structures: while – do.. while – if then else – switch – for loops – default statement – Arrays : One – multi dimensional – Declaration of array structure – Simple programs - Size of operators – Storage classes and scope – Functions : Function declaration – Prototyping – Pointers – Pointer variable – Pointers as function argument – One, multi dimensional arrays as function arguments. Files – Files I/O – Structures – Unions.

Block 3: Data Structures: Introduction – arrays – representation of arrays in memory – sparse array – Lists: Basic concepts – Implementation of Lists – Doubly linked list – Circular linked list – Garbage collection – Stacks and Queues: Stack operations – Array and pointer implementation of stacks – Application of stacks – Queue operations – Implementation of queues – Application of queues. Graph: Basic Terminology – Representation – Traversals - DFS – BFS – Shortest path problem – Minimal spanning tree.

Block 4 : Trees : Concepts – Binary tree – Binary Tree traversals – inorder – preorder – postorder – Binary search tree (BST) – BST operations – Balanced Tree. Searching: Linear search – Binary search. Sorting: Definition – Sorting techniques: Insertion – Bubble – Quick Sort – 2 way merge – Heap – Data Storage: Magnetic Tapes, Disk – Sorting with disk and tape – Buffering.

Reference Books:

1. Programming in ANSI C, E Balagurusamy, Tata McGraw-Hill, 2004.
2. Fundamentals of Data Structures, Ellis Horowitz, Sartaj Sahni, Computer Science Press, 1976

BSCS-06: Visual Basic Programming

Block 1: Introduction to Windows Programming and Visual Basic: Components of Windows Programming : Graphical User Interface – Window and its elements – Dialog Box – Drop-Down and Pop-Up menus – Visual Basic – Event-Driven Programming – Steps in Building a Project – User Interface Design – Writing Code – Visual Basic IDE – Creating and Running a simple project

Block 2: Visual Basic Forms and Controls: Form – Tool Box controls – Property window – Design and Run-time properties – Events – Keyboard, Mouse, Code and System events – Visual Basic Object oriented programming – Creating buttons at run-time through object declaration - Screen, Printer, Error Objects

Block 3: Visual Basic Programming: Visual Basic Data Types - Constants: predefined constants – User-Defined constants – Variables – Scope Rules – Control Structures – If – Select Case – Loops – FOR , DO, WHILE loops – Goto – On Goto statements – Event procedures – User defined procedures – Library functions – Numeric, String, Boolean and miscellaneous functions – Sub Main() procedure – User-defined functions – Public, Private Scope rules – Creating EXE files – Arrays – User-defined data type – Type statement – Control Arrays – Graphics handling – Using multiple forms – Activating a form – Multiple Document Interface – A simple MDI application

Block 4: Visual Basic Advanced Features: Creating a Database in VB – Accessing an external database with Data Control – Object Linking and Embedding (OLE): Linking and embedding an excel worksheet with VB project – Using third-party controls in VB - Creating an Active X control project – Activating other applications from VB – Windows Application Program Interface functions (WINAPI)

Reference Books:

1. An Introduction to Programming using Visual Basic, David I. Schneider, Prentice Hall, 1995
2. Ready-to-Run Visual Basic Algorithms, Rod Stephens, J. Wiley Publication, 1998
3. "Visual Basic 6 from ground up" Garry Cornell, TMH, 1999.

BSCS-P1: Lab 1: 'C' and VB Programming

BSCS-07:   Applied Operations Research

Block 1 : Operations Research: Scope – Mathematical Models – Linear Programming – Graphical Method- Simplex Method – Big –M Method- Two Phase Simplex Method.

Block 2: Programming Techniques: Goal Programming – Integer Programming – Dynamic Programming.

Block 3: Sequencing Models: N Jobs on two Machines-N Jobs on Three Machines- N Jobs on M machines.

Block 4: Replacement Models: Replacement of Machines without considering the value of money- Replacement of Machines with Considering the value of Money- Group Replacement and Individual Replacement Policy.

Reference Books:

1. Operations Research, An Introduction, Hamdy A.Taha, PHI, 7th Edition, 2004
2. Operations Research, Kantiswarup, Guptha and Man Mahon, S. Chand & Sons, 1987
3. Operations Research An Introduction, Prem kumar Gupta and D.S Hira, S.Chand & Company.
4. Linear Programming, G. Hadley, Narosa Publishing House, 1995.

BSCS-08: Design and Analysis of Algorithms

Block 1 : Introduction to Algorithms and its Development : Introduction - Algorithms – Basic Tools : Top-down structured Programming – Program Correctness – Example : The Knight's Tour- Basic Steps in Development : Statement of the Problem – Development of a Model – Design of an Algorithm – Correctness of the Algorithm – Programme Testing – Documentation.

Block 2: Growth –of –Function – Summations –Formulas and Properties - Recurrences.

Block 3: Algorithm Design Methods: Basic Problem Solving Methods: Sub goal-Hill-Climbing and Working Backward – Example: Jeep Problem -Backtrack Programming: Example: Bicycle Lock Problem – Branch and Bound - Example: Traveling Salesman Problem for five-city network - Recursion: Example: Factorials and Fibonacci Series - Ackermann's Function.

Block 4: Complexity Analysis of Sorting and Searching: Sorting: Heap Sort - Bubble Sort- Selection sort - Quick Sort. Searching: Binary search - Linear Search.

Reference Books:

1. Fundamentals of Computer Algorithms, Ellis Horowitz and Sartaj Sahni, Galgotia Publications.
2. Introduction to the Design and Analysis of Algorithms, S.E. Goodman and, S.T. Hedetniemi.

BSCS-09: Object Oriented Programming with C++

Block-1 : C++ Fundamentals: Object Oriented Programming - Programming Paradigms – Benefits and Concepts – Advanced Concepts – OOP languages – Overview of C++ - Structure of a C++ Program – Header Files - Keywords – Tokens and Identifiers – Compiling – Running C++ programs - Constants and Variables: Data Types – Integer – Float – Char – Double – Pointer – Variable and Constant declarations – Macro definitions – Reference variables – Complex variables – Type conversions – Type casting – Storage classes : auto, register, static, extern - Input and Output: Stream I/O – I/O Manipulators – Creating I/O manipulators – IOS flags – Stream buffer class hierarchy.

Block-2 : Programming Constructs : Operators: Arithmetic – Relational – Logical – Assignment – Pre and Post Increment & Decrement – Bitwise – Scope Resolution :: operator – ?(conditional) – Value operator – Member operator – Indirection operator – new and delete operator – Precedence rules – Control structures: if – else – if elseif ladder – switch case - Iterative constructs - Loops – for loop – while loop – do while loop – Initialisation – exit condition – increment/decrement for three loops compared – Nesting loops – Creating infinite loops – break and continue statements – goto statement and labels.

Block-3: Data Structures: Arrays: Single Dimensional arrays - Declaration – Initialization – Multi-Dimensional arrays – Declaration – Initialization – Addressing method – Subscripts – Character arrays – Initialization – Null Character – Multi-dimensional character arrays – Structures: – Declaration – Definition – Bitfields – Array of structures – Structure containing arrays – Pointer to structures – Structures versus unions – Anonymous unions.

Block – 4 : Structured and Object Oriented Programming : Functions: Structured Programming – Function definition & declaration – Parameters – Arguments – Return Values – void – Call by value parameters – Call by reference parameters – Passing arrays – Passing structures – Passing a function to another function – Pointer to function – Recursive function – Classes : and Objects – Visibility Labels – private, public and protected – Data members – Member functions – Object declaration and accessing members – Passing objects to functions – Returning objects – Constructor function – Destructor function – friend functions – static data and function members – Inline functions versus macros – Overloading: Compile-Time Polymorphism – Function overloading – Rules for function overloading – Operator overloading – rules for operator overloading - Function templates – Class templates – Extensibility – Reusability – Inheritance – Run-Time Polymorphism – Virtual functions- Files: fstream header file - text and binary files creation and access – random access in files – storing objects in files – command-line arguments to main() function – Exception handling – Unified Modeling Language (UML) – Context Diagrams.

Reference Books:
1. Object Oriented Programming with C++, E. Balagurusamy, McGraw Hill, 2006
2. Let us C++, Yaswant Kanetkar, BPB Publications
3. Object Oriented Programming in C++, N.Barkakati, PHI.

BSCS-10: Introduction to Database Management Systems

Block 1 : DBMS concepts : Introduction – Basics of Database – Three views of Data – Three level architecture of DBMS – Facilities – Elements of DBMS – Advantages and disadvantages – File Management system and its drawbacks – Database Models: E-R Model-Hierarchical Model-Network Model- Relational Model.

Block 2: File Organization: Introduction – Methods of File Organization – Sequential, Direct, Index Sequential – Multi Key file organization – Management Considerations: Objectives – Conversion – Evaluation of DBMS – Administration of DBMS.

Block 3: RDBMS and DDBMS: Introduction – Relational Model – Concept – Definition of a relation – Relational algebra and relational completeness – Normalization: Objectives – Functional dependency – Anomalies in a database – Properties of Normalization – Various Normalization techniques – Examples of database design

Block 4: SQL: Types of SQL commands – Data definition – Data Manipulation statements – Distributed Databases: Structure of Distributed database – Design of Distributed database.

Reference Books:

1. Database System Concepts, Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill, 1999.
2. An Introduction to Database systems, Bibin C. Desai, Galgotia Publications.1998.
3. Fundamentals of Database Systems, Elmasri & Navathe, 5th Edition, Addison Wesley, 2006.
4. An Introduction to Databases Systems, C.J. Date, A. Kannan, S.Swamynathan, Pearson Education, 2008.

CCE: ENVIRONMENTAL STUDIES

Block 1: The Multi disciplinary nature of environmental studies - Definition, scope and importance - Need for public awareness.

Block 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.

Block 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:-

a. Forest ecosystem
b. Grassland ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Block 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.

Block 5: Environmental Pollution - Definition - Causes, effects and control measures of : Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards - Solid waste Management - Causes, effects and control measures of urban and

industrial wastes. - Role of an individual in prevention of pollution - Pollution case studies - Diaster management: floods, earthquake, cyclone and landslides.

Block 6: Social issues and the Environment - From Unsustainable to Sustainable development - Urban problems 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 - Environment Protection Act - Air (Prevention and Control of Pollution) Act - Water (Prevention and control of Pollution) Act - Wildlife Protection Act - Forest Conservation Act - Issues involved in enforcement of environmental legislation - Public awareness.

Block 7: Human Population and the Environment - Population growth, variation among nations - Population explosion - Family Welfare Programme - 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.

BSCS P2: Lab 2- C++ Programming and RDBMS

BSCS – 15: Data Communications and Networking

Block-1: Data Communication: Components- Data   Representation – Data Flow, Networks: Distributed Processing- Network criteria- Physical Structures – Network Models – Types of Networks - Protocols and Standards.

Block-2: Layered Tasks: OSI Reference models – TCP/IP Protocols – Addressing – Data and Signals: Analog and Digital – Periodic and Non periodic signals – Periodic Analog Signals.

Block 3: Transmission media: Guided media: Twisted pair Cable – Coaxial Cable – Fiber Optic Cable, Unguided media: Wireless- Radiowaves – Microwaves-Infrared.

Block 4: Network devices: Connecting Devices: Passive Hubs- Repeaters- Active Hubs- Bridges – Two layer Switches – Routers – three layer switches – Gateways. Logical Addressing: IPv4 – IPv6.

Reference Books:

1. Data communications and networking, Behrouz A. Forouzan, Tata McGraw Hill, 2007.
2. Computer Networks, Andrew S.Tanenbaum, Prentice-Hall of India, New Delhi, Third Edition, 2003.
3. Data and Computer Communications, William Stallings, Prentice Hall, 2000.
4. Computer Networking with Internet Protocols and Technology, William Stallings, Pearson/Prentice Hall, 2003.

BSCS-16: Introduction to Operating Systems

Block 1: Fundamentals of Operating System: Introduction: What is an operating system – History of operating systems – Operating system concepts – System calls – Operating system structure-Process Management: Introduction to processes.

Block 2: Inter-process Communication: Race conditions – Critical sections – Mutual exclusion – Semaphores – Event counters – Monitors – Message Passing - Process Management : Introduction - Round robin scheduling – Priority Scheduling – Multiple queues – Shortest job first – Policy driven scheduling – Two level scheduling.

Block 3: Deadlocks: Resources – Deadlock modeling – Detection and Recovery – Deadlock Prevention – Avoidance.

Block 4: Memory Management: Memory management without swapping or paging: Multiprogramming without swapping or paging – Multiprogramming and Memory usage – Multiprogramming with fixed partitions - File Management: File basics – Directories – Disk space management – File storage – Directory structure.

Reference Books:

1. Operating System Concepts, Abraham Silberschatz, Peter B. Galvin, Contributor Peter B. Galvinm, Addison-Wesley, 1994.
2. Operating system Design and Implementation, Andrew S. Tanenbaum – PHI, 1987.
3. Operating System, Milan Milankovic, McGraw Hill.1987.

BSCS-17: Java Programming

Block 1:   Fundamentals of Java Programming: Internet Programming: Introduction – Fundamentals of Java - Applets and Applications – Features of JAVA – JVM – Java API - Java libraries – Structure of a Java program - Java variables – Constants - Java data types – Operators – Keywords – Type Casting.

Block 2 : Java Programming Constructs : Statements : if – if else if – for – while – do while – switch case – break – continue - go to – Simple Java programs. Arrays: one dimensional – multidimensional – Initialisation of arrays – Simple programs. Classes – Objects – Constructor: default – parameterised   - copy.

Block 3 : Subclassing and Exception Handling : Subclassing – abstract class – extends keyword – instanceof operator – final keyword – static variables and methods – Access specifier – Wrapper classes – Inner classes – Simple programs - Exception Handling : Exception classes – try and catch – multiple exceptions – built-in exceptions - using finally – throw – catching exceptions – user defined exceptions.

Block 4: Packages and Interfaces: Packages – creation – Adding classes to existing package – Interfaces – creation and implementation – Features – Object Oriented Programming in Java - Applet Programming: Applet creation – execution – GUI creation – Designing layouts – Multithreading – Simple Programs.

Reference Books:

1. Java Programming a Primer, 3e, Dr.E.Balagurusamy. Tata McGraw-Hill,
2. The Java Handbook, Patrick Naughton, Osborne McGraw-Hill, 1996

BSCS-18: HTML & WEB DESIGN

Block 1: Introduction to HTML: manipulating and formatting HTML text: HTML terminology overview- Tags and attributes – Absolute and relative URLs – Basic Font manipulation techniques – Advanced text formatting.

Block 2 : Placing and Manipulating Images: Working with the <img> Tag – Working with Image Alternate text – Image and Text Formatting – Adding Space around an Image – manipulating Images in an HTML Editor. Working with Page Layout: Page background Image – setting a background Image.

Block 3: Creating and manipulating Tables: Table basics – Configuring Specific Table attributes – Nesting Tables within tables.

Block 4: HTML Editor: Creating a FrontPage Web – The File Menu – The Edit Menu – The View Menu – The Insert Menu – The Format Menu – The Tools Menu – The Table Menu – The Frames Menu. Web Casting Techniques: Introduction – Search Engine – Search tools – Subscribing – Channels - Channels Push technology.

Reference Books:

1) HTML Professional Projects, John W. Gosney, Eswar Press.
2) Internet and Web Technologies, Raj Kamal, Tata McGraw- Hill. 2002

BSCS-19: Introduction to Software Engineering

Block 1: Software Engineering Concept: Definition – Software Product – Components and characteristics – Phases in Software development – Software Process Models: Linear Sequential – Prototyping – RAD – Spiral – Incremental – Formal methods – Fourth generation techniques.

Block 2 : Project Management Concepts : People – Product – Process – Project Development Team Structures - Software Crisis – Role of System Analyst – Project planning and control : Planning objectives – Software scope – Resources – Project Estimation – Decomposition Techniques – Estimation Models – Project standards – Outsourcing – Risk Management : Risk – Identification – Projection – Refinement – Mitigation.

Block 3: Project Scheduling and Tracking: Basic concepts – Defining task set for the software project – Scheduling Plan – Software Quality Assurance: Quality concepts – Quality Assurance Activities – Software Reviews – Formal Technical Reviews – Software Reliability – ISO 9000 quality standards – Software Configuration Management.

Block 4 : Software Analysis, Design and Testing : Analysis concepts and principles – Software prototyping – Specification Modeling and Information flow – Behavioural Modeling – Design Concepts and principles – Modular design – Architectural design and process – User Interface design – Software Testing : Principles – Test case design – White Box test – Block box testing – Testing Strategies : Unit – Integration – Validation – System – Art of debugging – Case study.

Reference Books:

1.   Software Engineering: A Practitioner's Approach, Roger S. Pressman, McGraw-Hill, 2004.
2.   Software Engineering, Ian Sommerville, Addison-Wesley, 2007.

BSCS - P3: Lab 3: Java Programming

BSCS – P4: Project Work

BSCS-11: Accounting and Financial Management

Block 1: Fundamentals of Accounting: Principle of Accounting – Accounting and its Function: Double Entry Book Keeping – Journal – Rules of Journalising – Ledger – Trial Balance – Rectification of Errors – Trading Profit and Loss Account – Balance Sheet.

Block 2 : Financial concepts : Financial Statement – Nature of Financial Statements – Limitations of Financial Statements – Types of Analysis – Tools of Analysis – Trend Analysis – Comparative Statement.

Block 3: Ratio Analysis: Types of Ratio – Factors affecting efficiency of Ratio – Limitations of Ratio – Fund Flow Analysis – Cash Flow Analysis.

Block 4: Methods of Costing and Budgeting: Marginal Costing – Break even analysis – Application of Marginal Costing – Limitations – Budgeting: Importance of Budgeting – Budget factors.

Reference Books:

1. Advanced Accountancy, R.L.Gupta, and M.Radhasamy, Sultan Chand & Sons.
2. Principles of Management Accounting, Man Mohan and Goyal.
3. Studies in Cost Accounting, P. Das Gupta, Premier Book company.

BSCS – 12: Management Information Systems

Block 1: Introduction to MIS: Concept, Definition, Role, Impact, Importance, MIS and Uses. Approaches to management, Functions of Manager, Manager and the environment, Management as a control System.

Block 2: Types of Information Systems: Decision Making, Concepts- Methods, Functions of DSS, Executive information System, MIS, TPS, ES.

Block 3: Business Information System: Functional Information Systems- Marketing Information – Manufacturing Information System- Quality Information System, Financial and Accounting Information System- Human Resource Information System.

Block 4: System Development Life Cycle & Tools for IS Development: System Development- System Analysis, System Design, System Development Life Cycle, Preliminary Investigation- Tools for System Development – DFD- Data Dictionary- Decision Trees.

References Books:
1. Management Information System, W. S. Jawadekar , Tata Mcgraw hill
2. Management Information System A Managerial Perspective, Uma G. Gupta, Galgotia Publications Pvt. Ltd. 1998

BSCS-13: Principles of Management

Block 1: Management – Features, Functions – Management as an art, Science, Profession – Evolution of management thoughts.

Block 2: Planning – Process, Importance, Nature and Scope, Types, Steps in Planning. Objectives, Policies, Procedures, Strategy- Decision making: Types of decisions, difficulties in decision making – Management by Objectives.

Block 3: Organising – Features, Importance – Principles of organizations – Types – Organisation structure – Delegation – Span of control – Line and staff relationship – Use of staff units and committees.

Block 4: Staffing – Sources of recruitment – Selection process – Training. Directing – Nature and purpose – Communication process.

Block 5: Need for Coordination – Controlling – Importance and functions of control – Control process – Budgetary and non- budgetary control.

Reference Books:

1. Management Process, Rustom Davar
2. Principles of Management, L.M. Prasad
3. Business Management, Dinkar & Pagare
4. Essentials of Management, Koontz & O Donnell
5. Principles of Management, Sherlekar

BSCS – 14: Managing Information Technology

Block 1: Roles of Information Technology (IT): Roles of Chief Information Officer (CIO) as Chief Technical Officer (CTO) – Chief Asset Officer (CAO) – Chief Knowledge Officer (CKO)

Block 2: IT / CIO and Promotion of Enterprise Innovation: A Framework for Enterprise Innovation by IT – Business Innovation by IT – Product Supply Innovation by IT – Management Innovation by IT – Promotion of Enterprise Innovation by IT

Block 3: IT Strategies: Information System Architecture – Important IT Techniques and Trends – Construction of Information System Architecture.

Block 4: CIO and Management of IT Management: Framework for IT Management – IT Asset Management – IT Process Management – System Cost Management – Innovation Strategies for IT Organisation – Management of IT Outsourcing.

Block 5: Preparation and Development of IT Master Plans: Case Studies Preparation and Development of Security Policy: Overview of Computer Security – Risk Assessment – Security Policy - Managing Information Systems.

Reference Books:
1. Strategic Planning for Information Systems, J. Ward and P. Griffiths
2. The Art of Strategic Planning for Information Technology, B.H. Boar
3. Managing in a Time of Great Change, P. Drucker
4. The Rise and Fall of Strategic Planning, H. Mintzberg

BSCS-20: Network Security

Block-1: Introduction: Security attacks, Security services and mechanism-model for network security-classical Encryption techniques - Symmetric cipher model - Substitution techniques-Transposition techniques & Steganography.

Block-2: Principles of modern symmetric ciphers: Block cipher principles - feistel cipher structure – DES - Encryption & Decryption, Differential & linear crypt analysis - AES.

Block-3: Public key encryption: Public key cryptography & RSA-Basics of number theory - RSA algorithm - key management - Diffe Hellman key exchange - Elliptic curve cryptography

Block-4: Message Authentication & Hash function: Authentication requirements – Authentication function- message Authentication codes - Hash function & security of hash function of MACs.

Reference Books:

1. Cryptography and Network Security Principles and Practices, William Stallings, fourth edition, Pearson Prentice Hall, 2008.
2. Information Security, Theory and Practice, Dhiren R.Patel , PHI 2008
3. Network Security, The Complete reference, Roberta Bragg, Mark Rhodes – Ousley, Keith strassberg , Tata McGraw Hill Edition, 2007.

BSCS-21: Software Testing

Block 1: Software Quality Assurance: software challenge - Software Quality – Software Quality factors – Software Quality Models- Software quality measurement and metrics – Software Quality Architecture.

Block 2: Introduction to Software Testing: Overview- Purpose of testing – Objectives – Inspection and Testing – Testing and debugging – Debugging process – Software testing life cycle – Responsibility of test team leader.

Block 3: Testing techniques: The V-Model – Testing techniques: Functional testing techniques – Non-functional testing techniques- Test metrics- Risk based testing – Extreme testing.

Block 4: Automated testing: Introduction – process - Types of automated test – Code auditing – Coverage Monitoring – functional test – Load test – Test Management - Advantages and Disadvantages of Automated test - Alpha and Beta site testing programs. Test Maturity Model: Human Issues and Challenges in testing.

Reference Books:
1. Software Quality Assurance, Nina S Godbole, Narosa Publishing House, 2008.
2. Software Quality Assurance, From Theory to Implementation, Daniel Galin, Pearson Education, 2004.
3. Software Quality Complete and Practices, R A Khan, K. Mustafa, SI Ahson , Narosa Publishing House, 2008.
4. Software Testing principles and Practices, Srinivasan Desikan, Gopalswamy Ramesh, Pearson Education, 2006.

BSCS-22: Compiler Design

Block 1: Introduction: Structure of complier- Roles of Lexical Analyzer- Tools-Regular Expressions- Symbol table- Error handling - Automata Concepts: Finite automata, Regular Expression to finite automata, Non-deterministic finite automata- Minimizing states of DFA.

Block 2: Parsing Techniques: Parser, Ambiguity, Shift reduce parsing, Operator precedence parsing, top down, Predictive parsing

Block 3: Intermediate code: Intermediate code, Postfix notation, Parse trees, Address code, Quadruples, and Triples.

Block 4: Optimization techniques: Principles of source of optimization, loop optimization, DAG representation of basic block, Other loop optimization techniques.

Reference Books:
1. Complier Principles, Techniques and Tools- Alfred V. Aho, Jeffery D. Ullman, Ravi Sethi, Wesley Publishing Company, 1986.
2. Principles of Complier Design - Alfred V. Aho, Jeffery D. Ullman, Narosa Publishing House, 1996.
3. Introduction to System Software, D.M. Dhandhere, Tata Mcgraw Hill, 1986

BSCS-23: TCP/IP Programming

Block 1: Introduction to TCP/IP: Introduction – TCP/IP layering – TCP/IP Stack : TCP level – IP level – Ethernet level – Internet Addressing: IP Address Format – IP address classes – Domain Name System (DNS) - Characteristics – DNS message format – Client Server Model.

Block 2: Internet Protocol (IP): Definition – IP Header – Structure – Components – IP Address – IP Address components – Formats and Classes – IP Routing – IP subnet addressing – subnet mask.

Block 3: Transmission Control Protocol (TCP): Introduction – Basic Terminology   - TCP Header – Structure – Components - Features of TCP.

Block 4: User Datagram Protocol (UDP) – Terminology – UDP Header – Structure – Format – Characteristics of UDP – Features of UDP, Internet multi casting – TCP/IP over ATM networks – Client Server model of Interaction Socket Interface.

Reference Books:

1. Internetworking with TCP/IP Volume – I, Principles, Protocols and Architecture, Douglas E. Comer
2. TCP/IP: Architecture, Protocols and Implementation, S.Felt, WCB / McGrawHill.
3. Introduction to TCP/IP , Forouzan, McGraw Hilll, 1999.

BSCS-24: Intranet Administration

Block 1: Intranet Fundamentals: The Intranet – Definition – How Intranet works? – Internet Vs Intranet – Advantages of Intranet – Types of Intranet : Bulletin board – Database management – Information access – The communications Intranet – Integrating Intranet – Catalogue Intranet – Sing Sign-On Intranet – Software and Hardware requirement for Intranet – Application areas – Future of Intranet. Intranet's Security: Security concerns – Threats – Security Solutions: Hardware – Software – Information – Certification – Firewalls – Encryption / decryption methods – Security policy – Multiple Layers of Intranet security – SOCKS – Advise from Security Experts.

Block 2 : Selection of Computing Infrastructure for Intranet – Hardware: Servers – Clients – Security Systems – Network Environment : LAN – Address Translation – Firewall – Software : Operating System – Groupware – Database connectivity - ODBC – JDBC – Other Aspects: Protocol Support Tools – Web based Tools : HTML, XML, CGI – Web authoring tools – Security tools: Firewalls – Virtual Private Network – Encryption/decryption using by SSL.

Block 3 : Configuring Intranet : Web authoring Preview – Web graphics – Adding Interactivity – Installation : Network installation and administration – User management – Disk quotas – Security configuration and Analysis – Account Policies – Permissions and restrictions – Tuning server performance – Configuring network settings – Networks and Security – Tuning applications over Intranet. Intranet Authoring and Managing tools: Authoring tools: Editors – Supporting applications for service – Graphical tools for creating and animating – Management tools: Databases – basic – ODBC – distributed – Web Servers – other tools.

Block 4 : Intranet Protocols: Communication cum mail protocols : ARP – SMTP – POP – IMAP – Service protocols: TCP – IP – TELNET – HTTP – FTP – UDP – Web server specific protocols – CGI – ISAPI – NSAPI – DMSP – Latest protocols : CDMA – WAP – GPRS – Protocols for E-Commerce.

Reference Books:

1.   David Linthicum's Guide to Client/Server and Intranet Development, David. S. Linthicum, John Wiley & Sons.
2.   Intranet's Decisions : Creating your organization's internal network, Lisa Kimball, Miles River Press
3.   Designing the Total Area Network: Intranets, VPN and Enterprise Networks Explained, Steve Pretty, John Wiley & Sons.