

**Scheme & Syllabus of
Bachelor of Computer Applications
(BCA)
Batch 2015**



By
Department of Academics

IKG Punjab Technical University

Scheme and Syllabus
Bachelor of Computer Applications, Batch-2015

SEMESTER-I		L	T	P	INT	EXT	TOTAL	Credits
BSBC101	Communication-I	3	1	-	40	60	100	4
HVPE101	Human Values and Professional Ethics	3	-	-	40	60	100	3
BSBC102	Programming in C	4	1	-	40	60	100	5
BSBC103	Mathematics-I	4	2	-	40	60	100	6
BSBC104	Information Technology	3	1	-	40	60	100	4
BSBC105	Software Lab-I (Programming in C)	-	-	4	60	40	100	2
BSBC106	Software Lab-II (Information Technology)	-	-	4	60	40	100	2
	Total	17	5	8	320	380	700	26
SEMESTER-II		L	T	P	INT	EXT	TOTAL	TOTAL
EVSC101	Environmental Science	2	-	-	40	60	100	2
BSBC201	Communication-II	3	1	-	40	60	100	4
BSBC202	Mathematics-II	4	2	-	40	60	100	6
BSBC203	OOPS Using C++	4	1	-	40	60	100	5
BSBC204	Computer System Architecture	3	1	-	40	60	100	4
BSBC205	Workshop on Web Development	-	-	4	60	40	100	2
BSBC206	Software Lab-III (OOPS Using C++)	-	-	4	60	40	100	2
	Total	16	5	10	320	380	700	25
SEMESTER-III		L	T	P	INT	EXT	TOTAL	TOTAL
BSBC301	System Analysis & Design	3	1	-	40	60	100	4
BSBC302	Data Structures	4	1	-	40	60	100	5
BSBC303	Digital Circuits & Logic Design	4	1	-	40	60	100	5
BSBC304	Basic Accounting	4	1	-	40	60	100	5
BSBC305	Software Lab-IV (Data Structures)	-	-	6	60	40	100	3
BSBC306	Hardware Lab-I (Digital Circuits & Logic Design)	-	-	4	60	40	100	2
	Total	15	4	10	280	320	600	24
SEMESTER-IV		L	T	P	INT	EXT	TOTAL	TOTAL
BSBC401	Software Engineering	4	1	-	40	60	100	5
BSBC402	Microprocessors & Microcontrollers	4	1	-	40	60	100	5
BSBC403	Operating Systems	4	1	-	40	60	100	5
BSBC404	Database Management Systems	4	1	-	40	60	100	5
BSBC405	Hardware Lab-II (Microprocessors & Microcontrollers)	-	-	4	60	40	100	2
BSBC406	Software Lab-V (Database Management Systems)	-	-	4	60	40	100	2
	Total	16	4	8	280	320	600	24

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17th June 2011

SEMESTER-V		L	T	P	INT	EXT	TOTAL	Credits
BSBC501	Data Warehousing & Mining	3	1	-	40	60	100	4
BSBC502	Programming in Java	4	1	-	40	60	100	5
BSBC503	Management Information System	3	1	-	40	60	100	4
BSBC504	Workshop on Advanced Web Development	0	0	6	60	40	100	3
BSBC505	Software Lab-VI (Programming in Java)	0	0	4	60	40	100	2
BSBC506	Project Work-I	0	0	6	60	40	100	6
	Total	10	3	16	300	300	600	24
SEMESTER-VI		L	T	P	INT	EXT	TOTAL	Credits
BSBC601	Principles of Management	3	1	-	40	60	100	4
BSBC602	Computer Graphics	4	1	-	40	60	100	5
BSBC603	Computer Networks	4	1	-	40	60	100	5
BSBC604	Information Security	3	1	-	40	60	100	4
BSBC605	Software Lab-VII (Computer Graphics)	0	0	4	60	40	100	2
BSBC606	Project Work- 2	0	0	6	120	80	200	6
	Total	14	4	10	340	360	700	26

First Semester

BSBC101 COMMUNICATION-I

Objective and Expected outcome:

The objective of this course is to make students understand that both oral & written communications are equally important. The students should be comfortable with both verbal & written communication.

SECTION-A

English Language: Sentence, Parts of speech, Tenses, Active passive voice, Direct Indirect speech, Creative writing & vocabulary, Comprehension passage, Reading of biographies of at least 10 IT business personalities (can be a home assignment or classroom reading).

(9) SECTION-

B

Business communication- Types, Media, Objectives, Modals, Process, Importance Understanding Barriers to communication & ways to handle and improve barriers. **(9)**

SECTION-C

Presentation skills- Its Purpose in business world, How to find material for presentation, How to sequence the speech with proper introduction and conclusion, How to Prepare PPT & Complete set of required body language while delivering presentation.

Reading & writing skills- Importance of reading and writing, improving writing skills through understanding and practicing Notice, E-mail, Tenders, Advertisement, formal letter. **(9)**

SECTION-D

Listening skills- Its importance as an individual and as a leader or as a worker, Its types, barriers to listening & remedies to improve listening barriers.

Nonverbal Communication- understanding what is called nonverbal communication, its importance as an individual, as a student, as a worker and as a leader, its types. **(9)**

Suggested Readings/Books:

1. **Effective Business Communication**, M.V. RODRIGUEZ
2. **Business Communication**, Meenakshi Raman, Parkash Singh, Paperback Edition, Oxford University Press.

HVPE101 Human Values & Professional Ethics

Objective/s and Expected outcome:

To help the students to discriminate between valuable and superficial in life. To help develop the critical ability to distinguish between essence and form, or between what is of value and what is superficial, in life—this ability is to be developed not for a narrow area or field of study, but for every day situations in life, covering the widest possible canvas. To help students develop sensitivity and awareness; leading to commitment and courage to act on their own belief. It is not sufficient to develop the discrimination ability, it is important to act on such discrimination in a given situation. Knowingly or unknowingly, our education system has focused on the skill aspects (learning and doing) – it concentrates on providing to its students the skill to do things. In other words, it concentrates on providing “How to do” things. The aspects of understanding “What to do” or “Why something should be done” is assumed. No significant cogent material on understanding is included as a part of the curriculum. A result of this is the production of graduates who tend to join into a blind race for wealth, position and jobs. Often it leads to misuse of the skills; and confusion and wealth that breeds chaos in family, problems in society, and imbalance in nature. This course is an effort to fulfill our responsibility to provide our students this significant input about understanding. This course encourages students to discover what they consider valuable. Accordingly, they should be able to discriminate between valuable and the superficial in real situations in their life. It has been experimented at IITH, IITK and UPTU on a large scale with significant results.

SECTION-A

1. Course Introduction – Need, Basic Guidelines, Content and Process for Value Education

- Understanding the need, basic guidelines, content and process for Value Education.
- Self Exploration – what is it? – its content and process; „Natural Acceptance” and Experiential Validation – as the mechanism for self exploration.
- Continuous Happiness and Prosperity – A look at basic Human Aspirations

- Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
- Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
- Method to fulfill the above human aspirations: understanding and living in **harmony** at various levels (8)

2. Understanding Harmony in the Human Being – Harmony in Myself!

- Understanding human being as a co-existence of the sentient, „I“ and the material „Body“
- Understanding the needs of Self („I“) and „Body“ – *Sukha* and *Suvidha*
- Understanding the Body as an instrument of „I“ (I being the doer, seer and enjoyer)
- Understanding the characteristics and activities of „I“ and harmony in „I“
- Understanding the harmony of I with the Body: *Sanyam* and *Swasthya*; correct appraisal of Physical needs, meaning of Prosperity in detail
- Programs to ensure *Sanyam* and *Swasthya* (7)

3. Understanding Harmony in the Family and Society - Harmony in Human-Human Relationship

- Understanding harmony in the Family- the basic unit of human interaction
- Understanding values in human-human relationship; meaning of *Nyaya* and program for its fulfillment to ensure *Ubhay-tripti*; Trust (*Vishwas*) and Respect (*Samman*) as the foundational values of relationship
- Understanding the meaning of *Vishwas*; Difference between intention and competence
- Understanding the meaning of *Samman*, Difference between respect and differentiation; the other salient values in relationship
- Understanding the harmony in the society (society being an extension of family): *Samadhan*, *Samridhi*, *Abhay*, *Sah-astitva* as comprehensive Human Goals

- Visualizing a universal harmonious order in society- Undivided Society (*AkhandSamaj*), Universal Order (*SarvabhaumVyawastha*)-from family to worldfamily! (8)

PART B

4. Understanding Harmony in the Nature and Existence – Whole existence as Co-existence

- Understanding the harmony in the Nature
- Interconnectedness and mutual fulfillment among the four orders of nature- recyclability and self-regulation in nature
- Understanding Existence as Co-existence (*Sah-astitva*) of mutually interacting units in all-pervasive space
- Holistic perception of harmony at all levels of existence (5)

5. Implications of the above Holistic Understanding of Harmony on Professional Ethics

- Natural acceptance of human values
- Definitiveness of Ethical Human Conduct
- Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
- Competence in professional ethics:
 - Ability to utilize the professional competence for augmenting universal human order
 - Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems
 - Ability to identify and develop appropriate technologies and management patterns for above production systems.
- Case studies of typical holistic technologies, management models and production systems
- Strategy for transition from the present state to Universal Human Order:
 - At the level of individual: as socially and ecologically responsible engineers, technologists and managers

○ At the level of society: as mutually enriching institutions and organizations

(8)

Suggested Readings/Books:

1. R R Gaur, R Sangal, G P Bagaria, 2009, *A Foundation Course in Value Education*.
2. Ivan Illich, 1974, *Energy & Equity*, The Trinity Press, Worcester, and Harper Collins, USA
3. E. F. Schumacher, 1973, *Small is Beautiful: a study of economics as if people mattered*, Blond & Briggs, Britain.
4. A Nagaraj, 1998, *Jeevan Vidya ek Parichay*, Divya Path Sansthan, Amarkantak.
5. Susan George, 1976, *How the Other Half Dies*, Penguin Press. Reprinted 1986, 1991
6. P. L. Dhar, R. R. Gaur, 1990, *Science and Humanism*, Commonwealth Publishers.
7. A. N. Tripathy, 2003, *Human Values*, New Age International Publishers
8. Subhas Palekar, 2000, *How to practice Natural Farming*, Pracheen (Vaidik) Krishi Tantra Shodh, Amravati.
9. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, *Limits to Growth – Club of Rome's report*, Universe Books.
10. E. G. Seebauer & Robert L. Berry, 2000, *Fundamentals of Ethics for Scientists & Engineers*, Oxford University Press
11. M. Govindrajran, S. Natrajan & V. S. Senthil Kumar, *Engineering Ethics (including Human Values)*, Eastern Economy Edition, Prentice Hall of India Ltd
12. B. P. Banerjee, 2005, *Foundations of Ethics and Management*, Excel Books.
13. B. L. Bajpai, 2004, *Indian Ethos and Modern Management*, New Royal Book Co., Lucknow. Reprinted 2008.

BSBC102 PROGRAMMING IN C

Objective and Expected Outcome:

The objective of this course is to help the students in finding solutions to various real-life problems and converting the solutions into computer programs using C language (structured programming). Students will learn to write algorithms for solutions to various real-life problems. Converting the algorithms into computer programs using C language.

SECTION-A

Algorithm and Programming Development: Steps in development of a program, Flow charts, Algorithm Development, Program Debugging, Compilation and Execution.

Fundamentals of C: I/O statements, Assignment Statements, Constants, Variables, Operators and Expressions, Standards and Formatted statements, Keywords, Data Types and Identifiers. (12)

SECTION-B

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

Functions: Introduction to Functions, Function Declaration, Function Categories, Standard Functions, Parameters and Parameter Passing, Call-by-value/reference, Recursion, Global and Local Variables, Storage classes. (12)

SECTION-C

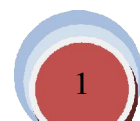
Arrays: Introduction to Arrays, Array Declaration, Single and Multidimensional Array, Memory Representation, Matrices, Strings, String handling functions.

Structure and Union: Declaration of structure, Accessing structure members, Structure Initialization, Arrays of structure, nested structures, Unions (12)

SECTION-D

Pointers: Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers, Pointers and Arrays

Files: Introduction, Creating a data file, opening and closing a data file, processing a data file.



Preprocessor Directives: Introduction and Use, Macros, Conditional Preprocessors,
Header Files (12)

Suggested Readings/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

BSBC103 MATHEMATICS-I

Objectives and Expected Outcome:

This syllabus of this course is specially designed for the beginners in computer science with the first exposure to mathematical topics essential to their study of computer science or digital logic. Topics like recursion and recurrence relations will help them in learning the important concepts of C language. The topic Graph Theory has applications in various fields of computer science like switching theory, logical designs, artificial language and computer graphics etc. These topics will help the students to understand various important concepts of the other subjects of the course. Further it will also provide ground for higher studies in these topics.

SECTION-A

SET THEORY AND RELATIONS

Sets- Elements of a set, methods of describing a set, types of sets, Operations on sets-- union, intersection and difference of sets, Venn diagrams, statement problems, Associative Laws, Distributive laws, De Morgan's laws, duality, partitioning of a set. **Relation** - Basic definition of relation and types of relations, graphs of relations, properties of relations, (domain, range, inverse and composite relations), Matrix representation of a relation.

(12)

SECTION-B

ALGEBRA OF LOGIC, MATHEMATICAL INDUCTION

Propositions and Logic operations, truth tables, arguments and validity of arguments, propositions generated by a set, equivalence and implication laws of logic, mathematical system and proposition over a universe, Quantifiers, Principle of Mathematical Induction.

(12)

SECTION-C

GRAPH THEORY

Various types of graphs- Simple and multi graphs, directed and undirected graphs, Eulerian and Hamiltonian graphs, Graph connectivity, graph traversals, graph optimizations, graph coloring, Trees, spanning trees.

(12)



SECTION-D

RECURSION AND RECURRENCE RELATIONS

Recursion, many faces of recursion, recurrence relations, some common recurrence relations,
Matrix Operations: Addition, Subtraction, Multiplication and Inverse

(12)

Suggested Readings/Books:

1. **Discrete Mathematical Structure with application to Computer Science**, Tremblay J.P. and Manohar R., McGraw Hill, 30th Reprint (2007)
2. **Text Book of Mathematics** (for XI Class), R.D. Sharma, Dinesh Publications
3. **Applied Discrete Structure of Computer Science**, Doerr A. & Kenneth L., Paperback Edition, Galgotia Publications Pvt. Ltd. New Delhi
4. **Graphics Networks and Algorithms**, Swami M.N.S & Thisiraman E., Second Edition, John Wiley & Sons

BSBC104 INFORMATION TECHNOLOGY

Objectives and Expected Outcome:

This course will enable the student to gain an understanding of the core concepts and technologies which constitute Information Technology. The intention is for the student to be able to articulate and demonstrate a basic understanding of the fundamental concepts of Information Technology

SECTION-A

Computer Fundamentals: Block structure of a computer, characteristics of computers, problem solving with computers, generations of computers, and classification of computers on the basis of capacity, purpose, and generation.

Number System: Bit, byte, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other, representation of characters, integers and fractions.

Binary Arithmetic: Addition, subtraction and multiplication. (9)

SECTION-B

Memory Types: Magnetic core, RAM, ROM, Secondary, Cache, Bubble Memory.

Input and Output Units: Keyboard, Mouse, Monitor (CRT and LCD): Light pen, joystick, Mouse, Touchscreen; OCR, OMR, MICR

Overview of storage devices: Floppy disk, hard disk, compact disk, tape.

Printers: Impact, non-impact, working mechanism of Drum printer, Dot Matrix printer, Inkjet printer and Laser printer.

Computer languages: Machine language, assembly language, higher level language, 4GL. Introduction to Compiler, Interpreter, Assembler, Assembling, System Software, Application Software. (9)

SECTION- C

Operating system: Batch, multi-programming, time sharing, network 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, Network



Neighborhood.

Personal Productivity Software:

Word processing: Editing features, formatting features, saving, printing, table handling, page settings, spell-checking, macros, mail-merge, equation editors.

Spreadsheet : Workbook, worksheets, data types, operators, cell formats, freeze panes, editing features, formatting features, creating formulas, using formulas, cell references, replication, sorting, filtering, functions, Charts & Graphs.

Presentation Graphics Software: Templates, views, formatting slide, slides with graphs, animation, using special features, presenting slideshows. (9)

SECTION-D

Computer Network and Communication: Network types, network topologies, network communication devices, physical communication media.

Internet and its Applications: E-mail, TELNET, FTP, World Wide Web, Internet chatting; Intranet, Extranet, Gopher, Mosaic, WAIS.

Security management tools: PC tools, Norton Utilities, Virus, worms, threats, virus detection, prevention and cure utilities, Firewalls, Proxy servers. (9)

Suggested Readings/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

BSBC105 SOFTWARE LAB-I (Programming in C)

Objective and Expected Outcome:

The objective of this course is to help the students in finding solutions to various real-life problems and converting these solutions into computer programs using C language (structured programming). Students will learn to write programs for solving various real-life problems.

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, call by reference, recursive functions
8. **Pre-processor Directives:** Pre-processor directives like INCLUDE, #DEF, 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,
12. **Files:** Creation and editing of various types of files, closing a file (using functions and without functions)

BSBC106 SOFTWARELAB-II(Information Technology)

1. Familiarizing with PC and WINDOW S commands,
2. File creation,
3. Editing
4. Directory creation.
5. Mastery of DOS internal & external commands.
6. Learning to use MS Office: MSWORD, MSEXCEL & MSPowerPoint.

Second Semester

EVSC 101 ENVIRONMENTAL SCIENCE

Objective/s and Expected outcome:

Upon successful completion of the course, students should be able to:

1. Measure environmental variables and interpret results
2. Evaluate local, regional and global environmental topics related to resource use and management
3. Propose solutions to environmental problems related to resource use and management
4. Interpret the results of scientific studies of environmental problems
5. Describe threats to global biodiversity, their implications and potential solutions

SECTION-A

Introduction: Definition and scope and importance of multidisciplinary nature of environment. Need for public awareness. (2)

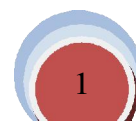
Natural Resources: Natural Resources and associated problems, use and over exploitation, case studies of forest resources and water resources. (4)

Ecosystems: Concept of Ecosystem, Structure, interrelationship, producers, consumers and decomposers, ecological pyramids-biodiversity and importance. Hot spots of biodiversity (4)

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 measure of urban and industrial wastes. Role of an individual in prevention of pollution. **Pollution case studies.** **Disaster Management:** Floods, earthquake, cyclone and landslides. (5)

SECTION-B

Social Issues and the Environment From Unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rainwater harvesting, watershed management. Resettlement and rehabilitation of people; its problems and



concerns. Casestudies.Environmental ethics:Issuesand possible solutions.Climate change,globalwarming,acidrain,ozonelayerdepletion,nuclearaccidents and holocaust.Casestudies. Wastelandreclamation.Consumerismandwasteproducts.EnvironmentProtectionAct.Air(PreventionandControlofPollution)Act. Water (Preventionandcontrolofpollution)Act. WildlifeProtectionAct,ForestConservation Act, Issues involvedinenforcement of environmental legislation Public awareness

(5)

Human Populationand the Environment, Population growth, variation among nations. Population explosion– Family Welfare Programme. Environment andhuman health, Human Rights, Value Education, HIV/AIDS. Women andchild Welfare.RoleofInformationTechnologyinEnvironmentandhumanhealth.Case studies

(4)

Suggested Readings/Books:

1. Agarwal,K. C. 2001**EnvironmentBiology**,Nidi Publ.Ltd.Bikaner.
2. Jadhav,H&Bhosale,V.M.1995.**EnvironmentProtectionandLaws**.HimalayaPub House,Delhi 284p.
3. RaoM.N.&Datta A.K.1987.**Waste WaterTreatment**.Oxford & IBH Publ.Co.Pvt.Ltd. 345 p.
4. **Principle ofEnvironmentScience** byCunninghan,W.P.
5. **Essentials of EnvironmentScience** byJoseph.
6. **EnvironmentPollutionControl Engineering**byRao,C.S.
7. **Perspectives inEnvironmentalStudies**byKaushik,A.
8. **Elementsof EnvironmentScience&Engineering**byMeenakshi.
9. **Elementsof EnvironmentEngineering** byDuggal.

BSBC 201 COMMUNICATION–II

Objective & Expected Outcome: The objective of this course is to make students understand the value of business communication, written & presentations skills in professional life. The students should be well equipped with business & written communication with effective presentations skills.

SECTION-A

Introduction to Business Communication (09)

Meaning and Definition; process and classification of communication; elements & characteristics of communication; barriers to effective communication in business organization; Formal and Informal communication; grapevine, importance of effective communication in business house; Principles of effective communication

SECTION-B

Writing Skills (09)

Inter-office memorandums; faxes; E-mails; writing effective sales letters to agents; suppliers; customers; report writing; project writing.

SECTION-C

Curriculum Vitae (CV) (09)

Drafting a CV; writing job application and other applications; do's and don'ts while appearing for an interview; types of interview.

SECTION-D

Presentation Skills (09)

Introduction; need of good presentations skills in professional life; preparing a good presentation; group discussion; extempore speaking.

Suggested Readings/Books:

1. **Effective Business Communication**-M.V. RODRIGUEZ
2. **Business Communication**-Meenakshi Raman, Parkash Singh, Paperback Edition, Oxford University Press

BSBC202 MATHEMATICS–II

Objectives & Expected Outcome: This syllabus is specially designed to help the students of computer science to understand the mathematical concepts like matrices, differential calculus and integral calculus which have applications in various subjects of computer science. Also Statistics has been added to help them understand the topics like central tendency, deviations, and moments etc which are very useful in day to day life. After learning these topics, students will be able to apply these concepts in designing the software applications for some specific devices.

SECTION-A

MATRIX ALGEBRA (12)

Matrix algebra- Matrices, types of matrices, operations on matrices, determinants (without properties), minors, cofactors, adjoint and inverse of a matrix, Elementary transformations in a matrix Rank of a matrix, solution of simultaneous equations using Cramer's rule and matrix inversion method.

SECTION-B

STATISTICS & APPLICATIONS OF LOGARITHMS (12)

Statistics- Introduction to statistics, measures of central tendency-mean, median and mode, measures of dispersion, mean deviation, standard deviation and coefficient of variation.

Applications of Logarithms- Problems related to compound interest, depreciation and Annuities.

SECTION-C

DIFFERENTIAL CALCULUS (12)

Introduction to differentiation, derivative of a function of one variable, power functions, sum and product of two functions, function of a function, differentiation by method of substitution, maxima and minima.

SECTION-D

INTEGRAL CALCULUS (12)

Indefinite Integral, Integration by substitution, Integration by parts, Integration by partial

fractions, Definite Integral. Numerical Integration: Trapezoidal rule, Simpson's $1/3$ rule, Simpson's $3/8$ rule.

Suggested Readings/Books:

- 1. Numerical Methods to Engineering**, B.S. Grewal, Seventh Edition, Khanna Publishers
- 2. Business Mathematics**, D.C. Sancheti, Eleventh Edition, Sultan Chand & Sons
- 3. Computer Oriented Numerical Methods**, Rajaraman, Third Edition, PHI Publications

BSBC203 OOPS USING C++

Objective & Expected Outcome: The objective of this course is to learn programming from real world examples and understanding object oriented approach for finding solutions to various problems with the help of C++ language. Students will learn to create computer based solutions to various real-world problems using C++ and will learn various concepts of object oriented approach towards problem solving.

SECTION-A

Introduction: Object oriented programming approach, characteristics of object oriented languages, Bridging C & C++ (Overview of C Concepts).

Structures and Unions: Declaration of structures, Accessing structure members, Structure Initialization, Array of structure, nested structures, structure with pointers, functions & structures, Unions, Structure/Union Versus Class in C++.

Class Declaration: Data Members, Member Functions, Private and Public Members, Data Hiding and Encapsulation, Array within a class. (12)

SECTION-B

Class Function Definition: Member Function definition inside the class and outside the class, Friend Function, Inline Function, Static Members & Functions, Scope Resolution Operator, Private and Public Member Functions, Nesting of Member Functions.

Creating Objects, Accessing class data members, Accessing member functions, Arrays of Objects, Objects as function arguments: Pass by value, Pass by reference, Pointers to Objects.

Constructors and Destructors: Declaration and Definition, Default Constructors, Parameterized Constructors, Constructor Overloading, Copy Constructors. Destructors: Definition and use. (12)

SECTION-C

Inheritance- Extending Classes Concept of inheritance, Base class, Derived class, Defining derived classes, Visibility modes : Private, public, protected; Single inheritance: Privately derived, Publicly derived; Making a protected member inheritable, Access Control to private and protected members by member functions of a derived class, Multilevel inheritance, Nesting of classes.

Function Overloading & Operator Overloading: Binary & Unary. (12)

SECTION-D

Polymorphism: Definition, early Binding, Polymorphism with pointers, Virtual Functions, late binding, pure virtual functions.

Input/output files: Streams, buffers & iostreams, header files, redirection, file input and output. (12)

Suggested Readings/Books:

1. **Object Oriented Programming with C++**, E. Balagurusami, Fourth Edition, Tata Mc-Graw Hill
2. **Object Oriented Programming in Turbo C++**, Robert Lafore, Fourth Edition Galgotia Publications.
3. **The C++ Programming Language**, Bjarne Stroustrup, Third Edition, Addison-Wesley Publishing Company.
4. **Object Oriented Programming Using C++**, Salaria, R.S, Fourth Edition, Khanna Book Publishing

BSBC204 COMPUTER SYSTEM ARCHITECTURE

Objectives and Expected Outcome: To make students aware about the basic building blocks of computer system and how the different components are interfaced together. Students will know about the basic functioning of various parts of computer system from hardware point of view and interfacing of various peripheral devices used with the system.

SECTION-A

Introduction to Computer Organization: Introduction to Computer and CPU (Computer Organization, Computer Design and Computer Architecture), Stored Program Concept-Von Neumann Architecture. Introduction to Flynn's Classification- SISD, SIMD, MIMD

Register Transfer and Microoperations- Introduction to Registers, Register Transfer Language, Data movement among Registers and Memory.

Microoperations: Introduction to microoperations, Types of microoperations--Logic Operations, Shift operations, Arithmetic and Shift operations.

Common Bus System: Introduction to Common Bus System, Types of Buses (Data Bus, Control Bus, Address Bus), 16-bit Common Bus System--Data Movement among registers using Bus. **(09)**

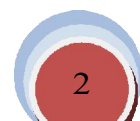
SECTION-B

Basic Computer Instructions- Introduction to Instruction, Types of Instructions (Memory Reference, I/O Reference and Register Reference), Instruction Cycle, Instruction Formats (Direct and Indirect Address Instructions, Zero Address, One Address, Two Address and Three Address Instructions)

Interrupt: Introduction to Interrupt and Interrupt Cycle.

Design of Control Unit: Introduction to Control Unit, Types of Control Unit (Hardwired & Micro programmed Control Unit).

Addressing Modes- Introduction & different types of Addressing Modes. **(09)**



SECTION-C

I/O Organization: I/O Interface Unit, types of ports (I/O port, Network Port, USB port, Serial and Parallel Port), Concept of I/O bus, Isolated I/O versus Memory Mapped I/O.

I/O Data Transfer Techniques: Programmed I/O, Interrupt Initiated I/O, DMA Controller and IOP.

Synchronous and Asynchronous Data Transfer: Concept of strobe and handshaking, source and destination initiated data transfer. (09)

SECTION-D

Stack Organization: Memory Stack and Register Stack

Memory organization: Memory Hierarchy, Main Memory (RAM and ROM chips, Logical and Physical Addresses, Memory Address Map, Memory Connection to CPU), Associative Memory

Cache Memory: Cache Memory (Initialization of Cache Memory, Writing data into Cache, Locality of Reference, Hit Ratio), Replacement Algorithms (LRU and FIFO).

Cache Memory Mapping Techniques: Direct Mapping, Associative Mapping and Set-Associative Mapping. Harvard Architecture, Mobile Devices Architecture (Android, Symbian and Windows Lite), Layered Approach Architecture. (09)

Suggested Readings/Books:

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

BSBC 205 WORKSHOP ON WEB DEVELOPMENT

Objectives and Expected Outcome/s: This course will enable the student to build and publish websites using Dreamweaver, a popular visual website production and management program, using HTML, DHTML, CSS and JavaScript. This course will enable the student to build and publish websites using Dreamweaver, a popular visual website production and management program. The intention is for the student to be able to:

1. Identify the entities responsible for implementing mark-up language standards.
2. Code and troubleshoot HTML and XHTML web pages, incorporating CSS and scripts.
3. Incorporate multimedia (images, animation, sound, and movies) into web pages.
4. Demonstrate effective use of Dreamweaver to build and publish professional web sites that employ best practices, adhere to current web standards, and pass validation.

• Introduction to Web Development:

Website, Webpage, Static Website, Dynamic Website.

• Introduction to HTML/DHTML:

HTML Basics, HTML Elements (Tags), Structure of HTML Program, Attributes, Headings, Paragraphs, Formatting, Links, Images, Tables, Lists, Forms, Frames, Where to put Tables, Lists, Images, Forms, CSS in DHTML, Implementation of Web Pages using CSS.

• Introduction to JavaScript:

How & Where to put the JavaScript Code, JavaScript Statements, Comments, Variables, Operators, Control Statements, Loops, Popup Boxes, Functions.

• Introduction to Dreamweaver:

Understanding Workspace Layout, Managing Websites, Creating a Website, Using Dreamweaver Templates, Adding New Web Pages, Text and Page Format, Inserting Tables, Lists, Images, Adding Links.

• Purchasing a Domain Name & Web Space:

Domain Name & Web Space, Getting a Domain Name & Web Space (Purchase or Free), Uploading the Website to Remote Server.

Suggested Readings/Books:

1. **HTML & CSS: The Complete Reference**, Thomas Powell, Fifth Edition
2. **Sams Teach Yourself HTML and CSS in 24 Hours** Julie C. Meloni & Michael Morrison, Eighth Edition
3. **HTML A Beginner's Guide** Wendy L. Willard, Fourth Edition
4. **HTML, XHTML and CSS All-in-One For Dummies** Andy Harris, Second Edition
5. **JavaScript, A Beginner's Guide** John Pollock, Third Edition
6. **Professional JavaScript for Web Developers (Wrox Programmer)** Nicholas Zakas, Second Edition C.
7. **Dreamweaver CS5 For Dummies** Janine C. Warner, Paperback Edition
8. **Adobe Dreamweaver CS5 Bible** Joseph Lowery, Paperback Edition
9. **The Essential Guide to Dreamweaver CS4** David Powers

Websites:

1. www.w3schools.com
2. www.html.net
3. www.thesitewizard.com
4. www.learn-dreamweaver-tutorials.com

BSBC 206 SOFTWARE LAB-III(OOPS using C++)

Instructions for candidates: All the following concepts need to be practised with at least 10 programs per topic and sub-topical along with their algorithms. Practical file needs to be maintained.

SECTION –A

Structures: Definition, declaration, scope, functions

Union: Definition, declaration, scope, functions

Class: Definition, declaration, members, scope of members.

SECTION –B

Class Function: definition (Inside class, outside class), in-line functions, static function, friend functions, scope of functions (public, private), and nesting of member functions

Class Data members: creating objects, accessing member functions, array of objects, objects as arguments (Pass by value, pass by reference)

Constructor and destructor: creating default constructor, parameterized constructor, copy constructor, destructor

SECTION –C

Inheritance: base class, derived class, visibility mode (public, private, protected), single inheritance, multi-level inheritance, multiple inheritance, nesting of classes, access control to functions (with different scope),

Function overloading and overriding, operator overloading,

SECTION –D

Early binding, late binding, virtual functions, pure virtual functions

Input/output files: streams, buffers and io-streams, various input-output functions, processing files using class functions

Third Semester

BSBC301 SYSTEM ANALYSIS & DESIGN

Objective/s & Expected Outcome: To teach the analysis and practicality of various systems on which software systems can be developed. After completing this course students will be able to design and develop systems.

SECTION-A

System Development Life Cycle: System Definition, characteristics, elements & types of system, Phases of SDLC, Information gathering tools, Structured Analysis tools, Role of System Analyst.

SECTION-B

System Design: Process and stages of systems design, Input/Output and file design, Documentation (User Manual, Design Documentation, Training Manual), Case Study techniques in system design.

SECTION-C

System testing: Unit Testing, System Testing, Integration Testing, Alpha & Beta Testing, Acceptance Testing, Regression Testing.

SECTION-D

System Implementation: System implementation Process, Implementation methods, System maintenance, Postimplementation maintenance.

Suggested Readings/Books:

- **System Analysis and Design** Awad Elias N. *Second Edition*, Galgotia Publications
- **Analysis and Design of Information System** Sen James A. *Second Edition*, Tata McGraw Hill.

BSBC302 DATA STRUCTURES

Objective/s Expected Outcome: Objective is to make the students understand how data is managed internally within any computer with the understanding of basic knowledge of C and C++. The students will gain the knowledge of basics of internal data structure.

SECTION-A

Introduction to Data Structures: Basic concept of data, Problem analysis, algorithm complexity, Big O notation and time space tradeoff, Types of data structures: arrays records, pointers, stack, queue, trees, linked list packet, blocks, tracks, sector (in storage devices).

Searching and Sorting: Use of various data structures for searching and sorting, linear and binary search, bubble sort, insertion sort, selection sort.

SECTION-B

Stacks & Queues: Basics of stacks and queues, Recursion, Polish notation, circular Queues, priority Queues.

SECTION-C

Linked Lists: Single linked list, Circular linked list, Doubly linked list and Dynamic storage management, generalized list, Garbage Collection.

SECTION-D

Trees: Definition & Concepts, Basic trees, Binary tree representations, Binary tree traversals and application of trees.

Suggested Readings/Books:

- **Data Structures**, Lipschutz Seymour, Second Edition, TMH
- **Algorithm + Data Structures = Programs**, Ni Claus Wirth, Prentice Hall
- **Data Structures**, Tanenbaum, Paperback Edition
- **An Introduction to Data Structures Applications**, Trembley & Soreson, Second Edition

BSBC303 DIGITAL CIRCUITS & LOGIC DESIGN

Objective/s & Expected Outcome: To give knowledge about the various electronics components and digital circuits to the students and designing of various building blocks of computer system. After studying this subject students will be able to design small projects and can easily understand the internal working of digital electronic circuits.

SECTION-A

Number System: Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number System, Conversion from One Number System to another, Arithmetic Operation without Changing the Base, 1's Complement and 2's Complement. **Logic Gates:** AND, OR, NOT, NAND, NOR, XOR, XNOR, NAND & NOR as Universal Gates, Logic Gates Applications.

SECTION-B

Boolean Algebra: Introduction, Theorems, Simplification of Boolean Expression using Boolean Algebra, SOP & POS Forms, Realization of Boolean Expression using Gates, K-Maps, Simplification of Boolean Expression using K-Maps. **Combinational Logic Circuits:** Half Adder & Half Subtractor, Full Adder & Full Subtractor, Parallel Binary Adder, Binary Adder/Subtractor.

SECTION-C

Combinational Logic Circuits: Multiplexers & Demultiplexers, Implementation of Boolean equations using Multiplexer and Demultiplexer, Encoders & Decoders. **Sequential Logic Circuits:** Latch, Flip-Flops-R-S Flip-Flop, J-K Flip-Flop, Master-Slave J-K Flip-Flop, Race Condition, Removing Race Condition, D Flip-Flop, T Flip-Flop, Applications of Flip-Flops.

SECTION-D

Counters: Clock Pulse Generator using 555 Timer as Monostable and Multivibrator, Design of Asynchronous Counters, Design of Synchronous Counters, Up-Down Counters, MOD-N Counters.

Suggested Readings/Books:

- **Digital Computer Electronics**, Malvino, Second Edition, Mc-Graw Hill
- **Modern Digital Electronics**, R.P. Jain, Fourth Edition, TMH
- **Digital Logic & Computer Design**, D. Morris Mano, Second Edition, PHI
- **Digital and Electronic Circuits**, T.C. Bartee, McGraw Hill
- **Digital Fundamentals**, Floyd, Ninth Edition, PHI
- **Digital Integrated Electronics**, Taub & Schilling, Eighth Edition, Mc-Graw Hill

BSBC304 BASIC ACCOUNTING

Objective/s&Expected Outcome: This course provides an orientation in the field of accounting and basic accounting fundamentals. After completion of this course, candidate would be able to record and post transactions in the basic accounting equation and maintain subsidiary ledgers.

SECTION-A

Basic Accounting Concepts: Background of Accounting, Introduction, importance and scope, Accounts – Types and classification; basic terms – Capital, Income, Expenditure, Expenses, Assets, Liabilities and application to Problems., Accounting Equation, Double Entry System.

Generally accepted accounting principles.

SECTION-B

Journal and Ledger- Journal and recording of entries in journal with narration; Ledger – Posting from Journal to respective ledger accounts. Basic concepts of purchase book, sales book and cash book. **Trial Balance:** Need and objectives; Application of Trial Balance; different types of errors escaped, trial Balance preparation.

SECTION-C

Final Accounts: Final Accounts without adjustments. **Bank Reconciliation Statement:** Bank transactions, Preparation of simple bank reconciliation statement.

SECTION-D

Sources of raising of capital in corporate undertaking: working Capital and Long term Capital. **Application of computers in accounting.**

Suggested Readings/Books:

- Managerial Accounting, Jawahar Lal, First Edition
- Financial Accounting, Dr. R.K. Mittal & M.R. Bansal
- Basic Accounting, Rajni Sofat & Preeti Hiro, Second Edition
- Accounting for management, Bhattacharya & Deaden, Paperback Edition, Vikas 1986
- Financial Accounting (Part I and Part II), R.L Gupta & V.K Gupta
- Fundamental Accountancy, S.N. Maheshwari
- Accounting Principal, Antony & Reece, Sixth Edition.

BSBC305 SOFTWARE LAB-IV (Data Structures)

Note: Program should be fully documented with sample I/O. Data Flowcharts should be developed wherever necessary.

Write an Algorithm and Program using functions for:

1. Program using Recursion.
2. Traversing the elements of an Array
3. Inserting an element in an Array
4. Deleting an element from an Array
5. Merging two Arrays
6. Linear Search
7. Binary Search
8. Insertion Sort
9. Bubble Sort
10. Selection Sort
11. Implementing PUSH & POP operations of a Stack
12. Array Implementation of a Queue and Circular Queue
13. Converting infix notation into postfix notation
14. Insertion in single and double Linked List
15. Deletion from single and double Linked List

BSBC306 HARDWARE LAB-I (Digital Circuits & Logic Design)

Basic Electronics: Introduction to Diode, Diode Characteristics, Transistor as a Switch & Logical Element, Introduction to TTL and MOS Technology, Transistor as Logic Element, Schottky Diode, Transistor, Transistor Characteristics, Transformer.

Practicals:

1. To study the function of basic logic gates and verify the truth table of AND, OR, NOT, XOR, NAND, NOR.
2. To study applications of AND, OR, NAND, X-OR gates for gating digital signals.
3. To develop the different Arithmetic Circuits:
 - a. Half-Adder and Subtractor.
 - b. Full-Adder and Subtractor.
4. To study the BCD to binary and binary to BCD Code converter.
5. Study of Decoder Circuits:
 - a. BCD-to-Decimal Decoder
 - b. BCD-to-7-Segment Decoder
6. Study of Encoder Circuits:
 - a. BCD-to-Decimal Encoder
 - b. Octal-to-Binary Encoder
7. To study the flip flop circuit using Gates:
 - a. R-S Flip Flop
 - b. J-K Flip Flop
 - c. Master Slave J-K Flip Flop
 - d. D-Flip Flop
8. To study R-S, J-K and D Flip Flop Using IC's.
9. Study of Ring Counter.
10. Study of Asynchronous and Synchronous Counters.

Fourth Semester

SOFTWARE ENGINEERING

BSBC401

Objective: The objective of this course is to make students familiar with all the software development principles, models and designing tools required to develop the software.

Expected Outcome: After completing this course, students will learn new techniques and models on which software development is based.

Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

SECTION A

Software: Characteristics, Components Applications, **Software Process Models:** Waterfall, Spiral, Prototyping, Fourth Generation Techniques, Concepts of Project Management, Role of Metrics And Measurement.

SECTION B

S/W Project Planning: Objectives, **Decomposition Techniques:** S/W Sizing, Problem Based Estimation, Process Based Estimation, **Cost Estimation Models:** COCOMO Model, The S/W Equation, **System Analysis:** Principles of Structured Analysis, Requirement Analysis, DFD, Entity Relationship Diagram, Data Dictionary. **S/W Design:** Objectives, Principles, Concepts, **Design Methodologies:** Data Design, Architecture Design, Procedural Design, Object – Oriented Concepts.

SECTION C

Testing Fundamentals: Objectives, Principles, Testability, **Test Case Design:** White Box & Black Box testing, **Testing Strategies:** Verification & Validation, Unit Testing, Integration Testing, Validation Testing, System Testing.

SECTION D

Advanced topics in Software Engineering:

Reengineering: Reverse Engineering, Restructuring, Forward Engineering.

Computer Aided Software Engineering (CASE): Taxonomy of CASE tools.

Suggested Books:

1. Roger S. Pressman, "Software Engineering – A Practitioner's Approach", Sixth Edition, McGraw Hill
2. R.E. Fairley, "Software Engineering Concepts", Paperback Edition, McGraw Hill.
3. Jalota, "An Integrated Approach to Software Engineering", Third Edition, Narosa Publishing House

MICROPROCESSORS & MICROCONTROLLERS

BSBC402

Objectives: To make students aware about the internal architecture of microprocessors and give the basic knowledge about the assembly level language programming.

Expected Outcomes: After studying this subject students will be able to understand the architecture of microprocessors and the various controllers used with it to enhance the performance of computer system. Students will be able to write assembly level programs for hardware interfacing.

Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 20 marks in all. Papers should be designed to emphasize the concepts of various technologies rather than memorizing.

Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

SECTION-A

Introduction to Microprocessors: Historical Background of Microprocessors, Applications of Microprocessors, Introduction to 8085, Architecture of 8085, Pin Diagram of 8085.

SECTION-B

Instruction Cycle, Timing Diagrams of Memory Read/Write Operations & timing diagrams of various Instructions, Addressing Modes, Instruction Set, Data Transfer Instructions, Arithmetic Instructions, Logical Instructions, Branch Instructions, Control Instructions, RISC & CISC Processors.

SECTION-C

Introduction to Microcontrollers:

Architecture of Microcontroller, Microcontroller Resources, Resources in Advanced and Next Generation Microcontroller, 8051 Microcontroller, Internal and External Memories, ROM Based Controller, Counters and Timers, Synchronous Serial and Asynchronous Serial Communication, Interrupts.

SECTION-D

Peripheral Devices and Controllers:

Introduction and Architecture of DMA Controller 8257, Architecture of Programmable Interrupt Controller 8259, Clock Generator, Architecture of 8284.

Suggested Books:

1. Microprocessor Architecture, Programming and Applications with 8085, Ramesh. S. Gaonkar, Fourth Edition, Penram International Publishing
2. 8051 Microcontroller and Embedded Systems, Muhammad Ali Mazidi Janice Gillispie Mazidi, Second Edition, PHI
3. Fundamentals of Microprocessors and Microcomputers, B. Ram, Fourth Edition, Dhanpat Rai Publications
4. The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium Pro Architecture, Programming and Interfacing, B. Brey, Fifth Edition, Prentice Hall International

OPERATING SYSTEMS

BSBC403

Objective: The objective of this course is to help students become familiar with the fundamental concepts of operating systems and provide students with sufficient understanding of operating system design.

Expected Outcome: Upon successful completion of this course, the student shall be able to:

1. Exhibit familiarity with the fundamental concepts of operating systems;
2. Exhibit competence in recognizing operating systems features and issues; and
3. Apply a mature understanding of operating system design and how it impacts application systems design and performance.

Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Section A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

SECTION A

Introduction: Application programs and system programs; functions of an operating system; classification of operating systems - Multi-user, multiprogramming, multiprocessing, time sharing, multi-threaded. Subsystems - Top Layer, Middle Layer, Bottom Layer, Bootstrap, Protection and security.

Processes and Threads: Program vs. Process; Process context, address space, identification, transition, state & management. Thread management - benefits, synchronization issues; applications of threads.

SECTION B

CPU Management: Objectives, Pre-emptive vs. Non-pre-emptive, context switching, scheduling schemes; multi-processor scheduling, thread scheduling.

Inter-process Communications: Introduction, message passing model, shared memory model. Pipe, FIFO and Socket.

SECTION C

Memory Management: Introduction, address binding, relocation, loading, linking, memory sharing and protection; Paging and segmentation; Virtual memory: basic concepts of demand paging, performance, page replacement. Thrashing.

I/O Device Management: I/O devices and controllers, device drivers; disk storage, scheduling and management.

SECTION D

File Management: Basic concepts, file operations, access methods, directory structures and management, remote filesystems; file protection.

Protection & Security: Need, environments: software, hardware, unauthorized use, denial of services, access control and authentication. Application security, attacks, virus & anti-virus, firewall.

Suggested Books:

1. Operating System Principles by Abraham Silberschatz and Peter Baer Galvin, Seventh Edition, Published by Wiley-India
2. Operating Systems by Sibsankar Haldar and Alex A. Aravind, Published by Pearson Education.
3. An Introduction to Operating Systems by Dietel H.M., Second Edition, Published by Addison Wesley.
4. Operating system by Milan Milenkovic, Second Edition
5. Operating system by Stalling, W., Sixth Edition, Published by Prentice Hall (India)

DATABASE MANAGEMENT SYSTEMS

BSBC404

Objectives: This course covers fundamentals of database architecture, database management systems, and database systems. Principles and methodologies of database design, and techniques for database application development.

Expected Outcome: Upon completion of this course, participants will have gained knowledge of database system concepts and the ability to:

- understand user requirements/views
- analyze existing and future data processing needs
- develop an enterprise data model that reflects the organization's fundamental business rules
- develop and refine the conceptual data model, including all entities, relationships, attributes, and business rules

Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Section A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

Instruction for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

SECTION A

An overview of DBMS: Concept of File Processing Systems and database systems, Database Administrator and his responsibilities. Physical and Logical data independence.

Three level Architecture of Database System: the external level, conceptual level and the internal level.

SECTION B

Introduction to Data Models: Entity Relationship Model, Hierarchical, Network and Relational Model. Comparison of Network, Hierarchical and Relational Model.

SECTION C

Relational data Model: Relational database, relational algebra and calculus, SQL dependencies, functional dependency, multi-valued dependency and join, normalization.

SECTION D

Database protection: Recovery, Concurrency Management, Database Security, Integrity and Control, Disaster Management

Distributed databases: Structure of a distributed database, design of distributed databases.

Suggested Books:

1. "An Introduction to Database System", Bipin C. Desai, Galgotia Publications.
2. "An Introduction to Database Systems", C.J. Date, Eighth Edition, Narosa Publications.
3. "Database System Concepts", Henry F. Korth, Fifth Edition, McGraw Hill.
4. "Introduction to Database Management", Naveen Prakash, TMH
5. "Principles of Database Systems", Ullman, Second Edition, Galgotia Publications.
6. "Database Systems: Design, Implementation, and Management", Rob Coronel, Ninth Edition

HARDWARE LAB-II(Microprocessors&Microcontrollers)

BSBC405

Using **8085 Microprocessor kits** do the following programs:

1. To examine and modify the contents of a register and memory location.
2. To add two 8-bit hexadecimal numbers without considering the carry generated.
3. To add two 8-bit hexadecimal numbers considering the carry generated.
4. To subtract two 8-bit hexadecimal numbers without considering borrow.
5. To subtract two 8-bit hexadecimal numbers considering borrow.
6. To add two 8-bit hexadecimal nos. The result should not be greater than 199.
7. To add two 16-bit hexadecimal numbers without considering the carry generated.
8. To add two 16-bit hexadecimal numbers considering the carry generated.
9. To subtract two 16-bit numbers without considering borrow.
10. To subtract two 16-bit numbers considering borrow.
11. To find 2's complement of 8-bit hexadecimal number.
12. To add series of 8-bit hexadecimal numbers neglecting the carry generated.
13. To separate 8-bit hexadecimal number into two digits (Breaking the byte into two nibbles).
14. To arrange the series of 8-bit hexadecimal numbers in ascending order.
15. To arrange the series of 8-bit hexadecimal numbers in descending order.

**SOFTWARE LAB-V (Database Management
Systems)
BSBC406**

This laboratory course will mainly comprise of exercise on what is learnt under the paper:

BSBC208

Familiarization with MS Access: Features, Elements, Part of MS Access Window, Creating and Saving Database, and Tables.

Using Queries: Running various DDL and DML commands using SQL, Creating Views

Using Forms and Reports in MS Access

Introductory Practical on using Crystal Reports

Fifth Semester

DATA WAREHOUSING & MINING

BSBC501

Objective: The objective of this course is to get students familiar with the data mining techniques, softwares and tools being used in Industries.

Expected Outcome: After completing this course, students will learn various tools and techniques which are prominent from Industrial point of view.

Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Section A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type conceptual questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

Internal Assessment-40 Marks
External Assessment-60 Marks

SECTION-A

Introduction to Data Warehousing, The need for data warehousing, Operational & Informational Data Stores, Data Warehouse Characteristics, Data Warehouse role & Structure, The cost of warehousing data.

Introduction to OLAP & OLTP, Difference between OLAP & OLTP. OLAP Operations

SECTION-B

Building a Data Warehouse, Design/Technical/Implementation Considerations, Data Pre-processing Overview, Data Summarization, Data Cleaning, Data Transformation, Concept Hierarchy, Structure, Patterns & Models, Artificial Intelligence (Overview).

Multidimensional Data Model, Schemas for Multidimensional Data (Star Schema, Snowflake Schema, Fact Constellation), Data Warehouse Architecture, Data Warehouse Design, OLAP

Three-tierArchitecture,Indexing&QueryinginOLAP,OLAM,EfficientMethodsofCube
Computation, DiscoveryDriven Exploration ofData Cubes, Attributed-OrientedInduction.

SECTION -C

AssociationRuleMining,MarketBasketAnalysis,AprioriAlgorithm,Mining Multilevel
AssociationRules, FromAssociationMiningtoCorrelationAnalysis, ConstraintBased
AssociationMining,IntroductiontoClassification,Classification by decisionTree,Attribute
Selection Measure.

SECTION -D

IntroductiontoPredictiontechniques,Accuracy ofaClassifier,Cross-Validation,Bootstrap,
Boosting,Bagging,IntroductiontoClustering,Classificationof VariousClustering Algorithms,
SelectingandUsingRightDMTechnique,SelectingandUsing RightDMTechnique,Data
Visualization.

SuggestedBooks:

1. Data Warehousing,Data Mining,andOLAP,AlexBerson,FirstEdition,TataMcGraw
Hill
2. DataMiningConcepts&Techniques, JiaweiHan&MichelineKamber,SecondEdition,
Morgan Kaufmann Publishers
3. ModernData Warehousing,Mining&VisualizationCoreConcepts,GeorgeMMarakas, First
Edition, PearsonEducation
4. Data Warehousing, Architecture&Implementation,Hawkin, PrenticeHall
5. DataMining:ModellingDataforMarketing,RiskandCustomerRelationshipMgmt,
Rud,Olivia, Paperback Edition
6. Data MiningTechniques,Berry,Michael, Third Edition
7. Data Mining,Data Warehousingand OLAP, Sharma, Gajendra, Second Edition
8. Data Mining with CaseStudies, GuptaGK, Second Edition
9. Principles of Data Mining, Hand,David

PROGRAMMING IN JAVA

BSBC502

Objective:The objective of this course is to let students understand basics of java programming language, development of programs and database connectivity.

Expected Outcome:Students will be able to create number of small applications in Java.

Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Section A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type conceptual questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

Internal Assessment-40 Marks

External Assessment-60 Marks

SECTION-A

FUNDAMENTALS OF OBJECT-ORIENTED PROGRAMMING: -Introduction; Object-Oriented Paradigm; Basic Concepts of Object-Oriented Programming Benefits of OOP; Applications of OOP.

JAVA EVOLUTION: -Java History; Java Features; How Java Differs from C and C++; Java and Internet, Java and World Wide Web, Web Browsers; Hardware and Software Requirements; Java Support Systems, Java Environment

OVERVIEW OF JAVA LANGUAGE:-Introduction;SimpleJavaProgram;Comments injava; An application with Two Classes; Java Program Structure; Java Tokens; Java Statements; ImplementingaJava Program;JavaVirtualMachine; Command Line Arguments;ProgrammingStyle.

CONSTANTS,VARIABLESANDDATATYPES:-Introduction;Constants; Variables;Data Types; Variables, Constants, Standard DefaultValues.

OPERATORSANDEXPRESSIONS:-Introduction toOperators,Expressions; OperatorPrecedence; MathematicalFunctions.

DECISION MAKING, BRANCHING AND LOOPING: - Decision making and Branching Statements, LoopingStatements, Labeledloops,JumpingStatements

SECTION-B

CLASSES,OBJECTSANDMETHODS:-Introduction;Defining aClass;Adding Variables; Adding Variables; Adding Methods; Creating Objects; Accessing ClassMembers;Constructors;Methods Overloading;Static Members;NestingofMethods;

Inheritance: Extending a Class; Overriding Methods; Final Variables and Methods; Final Classes; FinalizerMethods;AbstractMethods andClasses;VisibilityControl.

ARRAYS,STRINGSANDVECTORS:- Arrays;ZaggedArrays;;Strings; String functions;Vectors; WrapperClasses.

INTERFACES: Introduction;Defining Interfaces;ExtendingInterfaces;Implementing Interfaces; AccessingInterfaceVariables, ImplementingMultipleInheritance usingInterfaces.

PACKAGES: Introduction; SystemPackages; Using System Packages; Naming Conventions; Creating Packages; Accessing a Package; Using a Package; Adding aClass to aPackage;Hiding Classes.

SECTION-C

MANAGING ERRORSANDEXCEPTIONS:- Introduction; TypesofErrors;Exceptions;Exception Handling using Try,CatchandFinally block:Throwing OurOwnExceptions;Using Exceptions for Debugging.

APPLET PROGRAMMING:- Introduction; How Applets Differ from Applications;Applet Life Cycle; Creating anExecutableApplet;PassingParameters toApplets;AligningtheDisplay;More aboutHTMLTags;DisplayingNumericalValues;Getting Input from the User.

GRAPHICSPROGRAMMING:-Introduction;The GraphicsClass;Lines and Rectangles;Circlesand Ellipses;Drawing Arcs;Drawing Polygons;LineGraphs;Using ControlLoopsinApplets;Drawing Bar Charts.

SECTION-D

JAVAAWT: -Java AWTpackage Containers;Basic User Interface components;Layouts.

EVENT HANDLING: -Eventdelegation Approach;ActionListener;AdjustmentListener, MouseListener;MouseMotionListener;WindowListener;KeyListener;ItemListener

JAVA I/O HANDLING : I/O File Handling(InputStream &OutputStreams,FileInputStream &FileOutputStream,DataI/PandO/PStreams,FileClass,ReaderandWriterStreams,RandomAccess File).

SuggestedBook:

1. Programming InJava, E-Balagurusami, Fourth Edition,TataMcGraw Hill
2. MasteringJava, Second Edition, BPBPublications
3. AdvanceJava, Ivan Bayross, BPBPublications

MANAGEMENT INFORMATION SYSTEM

BSBC 503

Objective: To familiarize students with different types of information systems used at different levels in organizations.

Expected Outcome: After the completion of this course, students will be able to know the concepts and usage of different types of information systems at various managerial levels in the organizations.

Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D, and E. Sections A, B, C, and D will have two questions from the respective units of the syllabus and will carry 10 marks each.

Section E will have 10 short answer type conceptual questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C, and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

Note: Suitable Case Studies must be incorporated while teaching for better understanding of the concepts.

Internal Assessment-40 Marks

External Assessment-60 Marks

SECTION-A

Introduction to Systems and Basic Systems Concepts, Elements (Components) of System, Characteristics of System, Types of Systems, System Approach. Information Systems: Definition & Characteristics, Types of Information, Role of Information in Decision-Making, Level of Management. Introduction to different kinds of Information Systems: ESS, EIS, DSS, MIS, KWS, TPS, OAS and EDP.

SECTION-B

An overview of Management Information System: Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Robert Anthony's Hierarchy of Management Activity, Structured Vs Unstructured Decisions, Formal Vs Informal Systems, Pitfalls in MIS Development.

SECTION-C

Simon's Model of Decision-

Making, DSS: Concept, Characteristics and Components, Gorry & Scott Morton Grid, Introduction to GDSS.

Developing Information Systems: Analysis & Design of Information Systems: Implementation & Evaluation.

SECTION-D

Functional MIS: A Study of Marketing, Personnel, Financial and Production MIS.

Suggested Books:

1. Management Information Systems, Goyal, D.P., Third Edition, Macmillan.
2. Management Information Systems, Oz, Effy, Thomson Press Indian Edition.
3. "Management Information Systems", Kanter, J., Third Edition, PHI.
4. "Management Information Systems", Davis, Gordon B. & Olson, M.H, Second Edition
5. "Information Systems for Modern Management", Murdick, Robert G., & Ross, Joel E., & Claggett, James R., Third Edition, PHI.
6. "Analysis, Design & Implementation of Information System", Lucas, Fourth Edition
7. Management Information Systems, Laudon K.C., Eleventh Edition, Pearson

WORKSHOP ON ADVANCED WEB DEVELOPMENT

BSBC 504

Objective: Objective of this course to learn modern web development technology using Microsoft ASP.Net and its various controls.

Expected Outcome: Students will develop a website in ASP.NET and make it online by the end of the semester.

Internal Assessment-60 Marks

External Assessment-40 Marks

SECTION-A

Introduction to ASP.NET:

.NET Framework (CLR, CLI, BCL), ASP.NET Basics, ASP.NET Page Structure, Page Life Cycle.

Controls:

HTML Server Controls, Web Server Controls, Web User Controls, Validation Controls, Custom Web Controls.

SECTION-B

State Management:

ViewState, ControlState, HiddenFields, Cookies, QueryStrings, ApplicationState, Session State, Profile Properties, Master Pages, Themes, Site Navigation.

Introduction to ADO.NET, Data Binding, Importing the SqlClient Namespace, Defining the Database Connection, Managing Content Using Grid View and Details View.

Security and User Authentication:

Basic Security Guidelines, Securing ASP.NET Applications, ASP.NET Memberships and Roles.

Working with Files and Email:

Writing and Reading Text Files, Uploading Files, Sending Email with ASP.NET.

Introduction to Web Services, Ajax, Silverlight.

SuggestedBooks:

1. BeginningASP.NET4: in C# andVB(Wrox),ImarSpaanjaars, PaperbackEdition
2. Sams Teach Yourself ASP.NET4 in 24 Hours, Complete Starter Kit ScottMitchell
3. Microsoft ASP.NET4 Step byStep(Microsoft),GeorgeShepherd, Paperback Edition

Websites:

- www.asp.net
- www.w3schools.com
- www.learn-asp.net
- www.aspnetutorials.com

SOFTWARE LAB-VI(Programming in Java)

BSBC505

Internal Assessment-60Marks

External Assessment-40Marks

Implementation of all the programs related to theory concepts studied in Programming in Java Paper [BSBC 502].

1. Operators and Mathematical Functions.
2. Decision making, Branching and Looping Statements.
3. Classes, Objects and Methods.
4. Arrays, Strings and Vectors.
5. Interfaces.
6. Packages.
7. Exception handling.
8. Applet Programming.
9. AWT.
10. Event Handling.
11. I/O Handling.

BSBC506 PROJECT WORK-I

Internal Assessment-60Marks

External Assessment-40Marks

Starting of Major Project named as Minor Project (Feasibility Study, Requirement Analysis and Design)

Tools for Minor Projects

Frontend	VB or .NET (Either VB .Net or ASP.Net) or Java
Backend	Sql Server or Oracle

In Minor Projects 2 normal applications and one database related application is must

Note: The break up of marks for the External practical will be as under

Viva Voce 15 marks

System Development 25 marks

Sixth Semester

PRINCIPLES OF MANAGEMENT

BSBC601

Objective: To have in-depth knowledge about different types of business organizations, practical applicability of the concepts of management across the different functions in organizations.

Expected Outcome: After the completion of the course students will have insights about the existence and practical functioning of business organizations.

Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type conceptual questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

Internal Assessment-40 Marks
External Assessment-60 Marks

SECTION-A

Forms of Business Organizations and Ownership: Sole Proprietorship, Partnership, Joint Stock Company, Public & Private undertakings, Government Companies.

Management: Meaning & Definition of Management, Nature, Scope and its various functions.

SECTION-B

Planning: Nature and purpose, types, steps in planning process.

Decision Making: Strategic, tactical and Operational decision, decision making process, rationality in decision making.

Organizing: Nature, importance, the organizing process, organizational objectives, formal and informal Organization, organization chart

Span of Management: Factors determining effective span

Section- C

Departmentation: Definition, Departmentation by function, by territory, product/service customer group, Management by objectives (MBO).

Authority: Delegation of Authority, Decentralization v/s Centralization.

Staffing: Definition, Manpower Management, factors affecting staffing, Recruitment and Selection, Performance Appraisal, Importance of Training.

SECTION-D

Motivation: Theories of Motivation, Hierarchy of needs theory, Theory of X and Theory of Y. **Leadership:** Styles, Theories of Leadership, Trait Approach and situational approach, Managerial Grid. **Controlling:** Meaning & nature, Steps in Controlling, Essentials of Effective Control Systems.

Suggested Books:

1. Essentials of Management, Koontz, Tenth Edition
2. Principles & Practices of Management, L.M. Prasad, Third edition
3. Management, Y.K. Bhushan, Fourth Edition
4. An Executive's Encyclopedia of Management Practices, Prof. Parag Diwan

Computer Graphics BSBC 602

Objective: The objective of the study is to let students understand basics of computer graphics, Input/output primitive and basic transformations, which can be applied on objects of graphics.

Expected Outcome: Practical applications of graphics, Program development and basic animations without using graphical softwares.

Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Section A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type conceptual questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

Internal Assessment-40 Marks
External Assessment-60 Marks

SECTION-A

Introduction to Active and Passive Graphics, Applications of Computer Graphics.

Input devices: light pens, Graphic tablets, Joysticks, Trackball, Data Glove, Digitizers, Image scanner, Graphs and Types of Graphs.

Video Display Devices-- Refresh Cathode Ray Tube, Raster Scan displays, Random Scan displays, Architecture of Raster and Random Scan Monitors, Color CRT-monitors and Color generating techniques (Shadow Mask, Beam Penetration), Direct View Storage Tube, Flat-Panel Displays; 3-D Viewing Devices, Raster Scan Systems, Random Scan Systems, Graphics monitors and workstations, Color Models (RGB and CMY), Lookup Table.

SECTION-B

Process and need of Scan Conversion, Scan conversion algorithms for Line, Circle and Ellipse, effect of scan conversion, Bresenham's algorithms for line and circle along with their derivations, Midpoint Circle Algorithm, Area filling techniques, flood fill techniques, character generation.

SECTION-C

2-Dimensional Graphics: Cartesian and need of Homogeneous co-ordinate system, Geometric transformations (Translation, Scaling, Rotation, Reflection, Shearing), Two-dimensional viewing transformation and clipping (line, polygon and text), Cohen Sutherland, Sutherland Hodgeman and Liang Barsky algorithm for clipping.

SECTION-D

Introduction to 3-dimensional Graphics: Geometric Transformations (Translation, Scaling, Rotation, Reflection, Shearing), Mathematics of Projections (parallel & perspective). Introduction to 3-D viewing transformations and clipping.

Suggested Books:

1. D. Hearn and M.P. Baker, "Computer Graphics", PHI New Delhi; Second Edition, 1995
2. J.D. Foley, A.V. Dam, "Introduction to Computer Graphics", S.K. Feiner, J.F. Hughes, Addison-Wesley Publishing Company, R.L. Phillips. N.Y.; Second Edition, 1994.
3. R.A. Plastock and G. Kalley, "Computer Graphics", Second Edition, McGraw Hill, 1986.

COMPUTER NETWORKS

BSBC603

Objective: This course provides an in-depth discussion of computer networks. It includes a detailed discussion of the different Network Models. Concepts that have a direct effect on the efficiency of a network (e.g. collision and broadcast domains, topology) are also discussed.

Expected Outcome: Towards the end of the course, students are expected to /able to:

- Be familiar with the different Network Models.
- Understand different network technologies
- Understand the effects of using different networking topologies
- Be updated with different advanced network technologies that can be used to connect different networks
- Be familiar with various hardware and software that can help protect the network

Instructions for Paper-Setter

The question paper will consist of five sections A, B, C, D and E. Section A, B, C and D will have two questions from the respective sections of the syllabus and will carry 10 marks each. Section E will have 10 short answer type conceptual questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

Instructions for Candidates

Candidates are required to attempt one question each from Sections A, B, C and D of the question paper and the entire Section E.

Use of non-programmable scientific calculator is allowed.

Internal Assessment-40 Marks

External Assessment-60 Marks

SECTION-A

Data communications concepts: Digital and analog transmissions-Modem, parallel and serial, synchronous and asynchronous, Modes of communication: Simplex, half duplex, full duplex, Concept of multiplexing, De-multiplexing.

Types of Networks: LAN, MAN, WAN

Network Topologies: Bus, Star, Ring, Mesh, Tree, Hybrid

Communication Channels: Wired transmissions: Telephonelines, leasedlines, switchline, coaxial cables- baseband, broadband, optical fiber transmission.

SECTION-B

Wireless Transmission: (Standards and Specification) Microwavetransmission, Infraredtransmission, Laser transmission, Radio transmission and Satellite transmission and BlueTooth, FrequencySpectrum.

Communication Switching Techniques: CircuitSwitching, MessageSwitching, Packet Switching.

Network Reference Models: OSI Reference Model, TCP/IP Reference Model, Comparison of OSI and TCP/IP Reference Models.

SECTION-C

Data Link Layer Design Issues: Services provided to the Network Layer, Framing, Error Control (error detection and correction code), Flow Control, Data Link Layer in the Internet (SLIP, PPP).

Types of Multiplexing: FDM, TDM, CDMA

SECTION-D

MAC sublayer: CSMA/CD/CA, IEEE standards (IEEE 802.3 Ethernet, Gigabit Ethernet, IEEE 802.4 Token Bus, IEEE 802.5 Token Ring)

The Network Layer: Design Issues, Routing Algorithms: Optimality Principle, Shortest Path Routing, Congestion Control Policies, Concept of Internetworking.

Suggested Books:

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

BSBC604 Information Security

Section A:

Information Security Concepts : Information Security Overview: Background and Current Scenario, Principles of Security- Information Classification, Policy Framework, Role based Security in an organization, Components of Information Systems, Balancing Information Security and Access, Approaches to information Security Implementation, Security Systems Development Life Cycle.

Section B:

Security Threats and Vulnerabilities: Overview of Threats and Vulnerabilities-Intruders, Malicious Software, Viruses and related Threats, Desktop Security, Email security: PGP and S/MIME, Web Security: Web authentication, SSL and SET, Database Security. Firewalls- Overview, Design principles and Types.

Section C:

Security Management and Laws: Introduction to Security Management, Access Control and Intrusion Detection, Overview of Identification and Authorization, Intrusion Detection Systems and Intrusion Prevention Systems, Security Procedures and Guidelines, Business Ethics and Best Practices, Security Assurance, Security Laws, IPR, International Security Standards, Security Audit, SSE-CMM/COBIT etc.

Section D:

Cryptography: Concepts and Techniques, Symmetric and Asymmetric Key Cryptography, Steganography, Symmetric Key Ciphers-DES, AES (Structure and Analysis). Asymmetric Key Ciphers- Principles of Public Key cryptosystems, RSA Algorithm and its Analysis. Digital Signatures.

Suggested Books

- 1) Introduction to Information Security and Cyber Laws Paperback-by Surya Prakash Tripathi (Author), Ritendra Goel (Author), Praveen Kumar Shukla (Author)
- 2) Principles of Information Security. Paperback-by Whitman (Author)
- 3) Cryptography and Information Security Paperback-by Pachghare V. K. (Author)

SOFTWARE LAB-VII(Computer Graphics)

BSBC605

Internal Assessment-60Marks
External Assessment-40Marks

Implement theFollowing Algorithms using C/C++:-

Useof basicfunctions ofgraphic available in C++like circle, putpixel, rectangle, arc, ellipse, floodfill, setcolor etc.

Useof basic primitive functions to show some animations.

Line DrawingAlgorithm likeDirect method, DDA and Bresenham's linealgorithms.

Drawa circleusingpolynomial, trigonometrymethod and Bresenham'sAlgorithm.

Drawan ellipse using Bresenham's Algorithm.

To movea character alongcircle.

To show 2DClippingand Windowing.

PROJECT WORK-II

BSBC606

Continuation to Project Work-I started in V semester (Code Generation, system testing, Installation and Operations & maintenance)

Internal Assessment-120 Marks

External Assessment-80 Marks

Tools for Project Work-II

Frontend	VB or .NET (Either VB .Net or ASP.Net) or Java
Reports	Crystal Reports
Backend	SqlServer or Oracle

Note: The break up of marks for the external practical will be as under

Viva Voce	20 marks
System development	60 marks