VINAYAKA MISSIONS SIKKIM UNIVERSITY

Programme: BCA **Batch 2015-16**

Semester I

Course No.	Course Title	L–T–P : CR
CBC1103	Programming with C	3 – 0– 0 : 3
UGC1101	General English	3 – 0– 0 : 3
UGC1103	Business Economics	3 – 0– 0 : 3
UGC1105	Introduction to Computer & IT	3 – 0– 2 : 4
UGC1106	Mathematics-I	3 – 1– 0 : 4
CBC1191	Practical-I	0 – 0– 4 : 2
		19

Semester II

Course No.	Course Title	L–T–P : CR
UGC2101	Mathematics-II	3 – 0– 0 : 3
CBC1202	Business Organization and Management	3 – 0– 0 : 3
CBC1203	Digital Electronics	3 – 0– 2 : 4
CBC1204	Object Oriented Programming (C++)	4 – 0– 0 : 4
CBC1205	Database management system	3 – 0– 2 : 4
CBC1291	Practical-II	0 – 0– 4 : 2
		20

Semester III

Course No.	Course Title	L– T–P :CR
CBC2101	Mathematics-III	3 – 0– 0 : 3
CBC2102	Computer Architecture	3 – 0– 0 : 3
CBC2103	SAD	4 – 0– 0 : 4
CBC2104	Financial Accounting	3 – 0– 0 : 3
CBC2105	Visual Programming with VB	4 – 0– 0 : 4
CBC2191	Practical-III	0 – 0– 4 : 2
		19

Semester IV

Course No.	Course Title	L–T– P : CR
CBC2201	Operation Research	3 – 0– 0 : 3
CBC2202	Data Structure	3 – 0– 2 : 4
CBC2203	Java Programming	4 – 0– 0 : 4
CBC2204	Operating System	4 – 0– 0 : 4
CBC2205	Computer Networks	4 – 0– 0 : 4
CBC2291	Practical–IV	0 – 0– 4 : 2
		21

Semester V

Course No.	Course Title	L–T–P : CR
CBC3101	Software Engineering	4 – 0– 0 : 4
CBC3102	Net Programming	4 – 0– 0 : 4
CBC3103	Internet Programming	3 – 0– 2 : 4
CBC3104	Management Information System	3 – 0– 0 : 3
CBC3105	Microprocessor System	3 – 1– 0 : 4
CBC3191	Practical-V	0 – 0– 4 : 2
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Semester VI

Course No.	Course Title	L–T–P : CR
CBC3201	Artificial Intelligence	3 – 0– 0 : 3
CBC3202	Computer Graphics	3 – 0– 2 : 4
CBC3203	Linux Environment	3 – 0– 0 : 3
CBC3291	Practical-VI	0 – 0– 4 : 2
CBC3292	Project Work	0 – 0– 4 : 2
	Field Visit	0 – 0– 4 : 2
CBC3291	Project seminar & Viva-Voce	0 – 0– 4 : 2
		18

Semester- I

Marks: 100

Course Code	Course Title	L - T - P : CR
CBC1103	Programming with C	3 – 0– 0 : 3

UNIT	Contents / Topics	L. Hrs.
I	**C Basic:** Introduction to Programming, Basic structure of C programs, Characters used in C, Identifiers, Keywords, Tokens, Constants, variables, Basic data types, operations and expressions, Input/ Output Functions and statements.	10
II	**Control Statement in C**: if statements, switch statement, for loop, while loop, do-while loop, goto statement, break statement. **Arrays:** Array declaration, initializing values in an array, array types.	10
III	**String Manipulation in C:** String handling functions in C. **Functions in C:** uses of functions, user defined functions, function declarations, calling a function, function prototype, recursion, Local or internal variables, Global or external variables, void function, storage classes in C.	8
IV	**Pointers:** Pointer declarations, expressions using pointers, pointers as function arguments, call by value, call by reference, advantages of pointers. **Structures and unions:** structure variables, initialization of structure variables, union.	8

References:

1. Programming in "C" E Balgurusamy Tata Cm Graw– Hill
2. The "C" Programming Language: Briain W. Kenigham&Dennis Ritchie
3. The Spirit of "C"- Henry Mulish, Herbert L. Cooper.

Marks: 100

Course Code	Course Title	L - T - P : CR
UGC1101	General English	3 – 0– 0 : 3

UNIT	Contents / Topics	L. Hrs.
I	Tenses, Proper use of Articles, Parts of speech, Common problems with Verbs, Adjectives etc, Active and Passive voice, Direct and Indirect Speech.	8
II	Sentences: Sentence structure, Parts of a sentence, Types of Sentences: Simple, Compound, Complex.	7
III	Preparing resume/CV, Writing Biography, Writing job application, Précis writing, Paragraph writing.	8
IV	Correct word usage –homonyms, antonyms and synonyms, Form and function of words.	4
V	Developing reading, listening and speaking skills.	4

References:

1. Contemporary English Grammar :JayanthiDakshina Murthy, Professional Communication : ArunaKoneru.

Marks:100

Course Code	Course Title	L - T - P : CR
UGC1103	Business Economics	3 – 0– 0 : 3

UNIT	Contents / Topics	L. Hrs.
I	The Scope and Method of Economics, The Economic Problem: Scarcity & Choice, The Price Mechanism, Demand & Supply Equilibrium: The concept of Elasticity and its Applications. The Theory of Production: Concept of Production function, Revenues, Costs and Profit Maximization, Laws of variable proportions & Returns to Scale.	12
II	Market Structure: Concept of Market, Equilibrium of a Firm and Price, Output Determination under Perfect Competition, Monopoly, Monopolistic Competition & Oligopoly.	8
III	Macro Economic Concerns: Inflation, Unemployment, Trade-Cycles: Circular Flow up to four Sector Economy, Balance of Trade and Balance of Payment. Government in the Macro Economy: Fiscal Policy, Monetary Policy, Measuring National Income and Output.	8
IV	The World Economy – WTO, Globalisation, Green Revolution, MNCs, Outsourcing, Role of Foreign Capital in India, Trips, Groups of Twenty (G-20), Issues of Dumping, Export- Import Policy 2004-2009.	8

References:

1. Ahuja H.L., "Business Economics", S. Chand & Co., New Delhi, 2001
2. Ferfuson P.R., Rothschild, R and Ferguson G.J. "Business Economics", Mac- Millan, Hampshire, 1993.
3. Karl E. Case & Ray C. Fair, "Principles of Economics", Pearson Education, Asia,2000
4. Nellis, Joseph, Parker David, "The Essence of Business Economics", Prentice Hall, New Delhi, 1992.

Course Code	Course Title	L –T –P: CR
UGC 1105	INTRODUCTION TO COMPUTER &IT	3 – 0 – 2 : 4

UNIT	Content/ Topics	L.Hrs.
1	**Introduction:** What are computers? , Computer Generation**,** Classification of computers, advantages, limitations and applications of computers. **Basic computer Organization:** Functional units- Input unit, output unit, Storage unit, ALU, CPU, Control, unit, various input/output devices. **Memory:** Computer Memory system, Primary storage and Secondary storage.	12
2	**Hardware & Software:** Input/Output devices, Compilers. **Operating System concepts**: different types of operating systems, DOS commands, working with Windows, MS-Office.	6
3	**Internet:** Introduction, use of internet, Security, Internet Requirements, Web Search Engine, World Wide Web WWW. **Computer Networks:** Overview of network, terminals, network types-LAN, MAN, WAN, network topologies.	7
4	**Introduction to IT and IT Enabled Services:** IT applications, IT Services, Ecommerce and E-Business.	11
5	**List of experiments:** 1. Familiarisation with Input / Output Devices. 2. Familiarisation with storage devices. 3. Familiarisation with computer software. 4. Net Surfing-Creating accounts and Email. 5. Working with MS-Word. 6. Working with MS-Excel 7. Working with MS-PowerPoint 8. Creating graphs in MS-PowerPoint	

References:

1. Fundamental of Computers – by V. Rajaraman B.P.B. Publications.
2. Fundamental of Computers – by P.K Sinha
3. Introduction to Computers -by Alex Leon & Mathews Leon, Vikas Publishing House.
4. Fundamentals of Information Technology, -by Alexis Leon and Mathews Leon, "Second Edition, Leon Press.

Course Code	Course Title	L - T - P : CR
UGC1106	Mathematics –I	3 – 0– 0 : 3

UNIT	Topic	L. Hrs.
I	**DETERMINANTS:** Definition ,Minors, Cofactors, Properties of Determinants	6
II	**MATRICES**: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication & Multiplication of Matrices, Adjoint, Inverse, Solving Linear Equation by using Cramer's Rule.	7
III	**LIMIT &CONTINUITY:** Limit at point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity at a point, Continuity over an Interval, Intermediate Value Theorem, Type of Discontinuities, Maxima & minima.	7
IV	**DIFFERENTIATION**: Simple Derivative, Derivatives of Sum, Differences, Product& Quotients, Derivatives of Composite Functions.	8
V	Simple Interest, Compound Interest, Annuities, Profit & Loss, Problems on Shares	8

References:

1. B.S.GREWAL,"Elementary engineering mathematics",34 ed, 1998..
2. H.K.DASS,"Advanced Engineering Mathematics", S.Chand&company ,9 Revisited,Edition,2001.
3. ShantiNarayan,"Integral Calculus",S.Chand& Company,1999
4. ShantiNarayan,"Differential Calculus", S.Chand& Company, 1998

Marks:100

Course Code	Course Title	L - T - P : CR
CBC1191	Practical-I	0 - 0 – 4 : 2

Experiments	Content/ Topics	P.Hrs.
1	**Programs to demonstrate the usage of operators and data types in C.** a. Write a program to print the size of all the data types supported by C and its range. b. Write a program to convert Fahrenheit to Celsius.	3
2	Programs to read and print a simple statement in C.	1
3	**Programs to demonstrate the usage of if, if-else, nesting of if-else and else-if ladder.** a. Write a program to check whether the given number is a Prime number or not. b. Write a program to accept three numbers and find the largest and second largest among them	5
4	**Programs using while loop, do-while loop and for loop.** a. Write a program to print all prime numbers between any 2 given limits. b. Write a program to print all the Armstrong numbers between any 2 given limits.	5
5	**Programs using arrays-One Dimensional array, two Dimensional Array.** Programs to demonstrate the usage of various strings function.	4
6	**Programs using switch-case.** a. Write a program to count the different vowels in a line of text. b. Write a program to accept two numbers and perform various arithmetic operations (+, -, *, /) based on the symbol entered.	3
7	**Programs to demonstrate the usage of functions and its calling procedures.** a. Write a program to find the roots of a quadratic equation b. Write a recursive program to find the factorial of a number.	5
8	**Programs to demonstrate the use of Structures.** a. Create an employee structure and display the same. b. Create a student database storing the roll no, name, class etc. Implement modify and search operations.	3
9	**Programs using pointers.** a. Write a function to swap two numbers using pointers b. Call by value and Call by reference.	3

References:

1. Programming in “C” E Balgurusamy Tata Cm Graw– Hill
2. The “C” Programming Language: Briain W. Kenigham&Dennis Ritchie
3. The Spirit of “C”- Henry Mulish, Herbert L. Cooper.

Semester-II

Marks: 100

Course Code	Course Title	L - T - P : CR
UGC2101	Mathematics-II	3 – 0– 0 : 3

UNIT	Contents / Topics	L. Hrs.
I	**Probability Theory**	7
II	**Functions:** Functions, one to one, many to one, onto and into functions, Composite functions, Inverse functions, Introduction to trigonometric, logarithmic and exponential functions. **Distributions:** Binomial, poisson, normal, chi-square, etc.	8
III	**Equations:** Linear, quadric, cubic and higher order equations	8
IV	**Curve Fitting:** Regression analysis and forecasting techniques.	8
V	**Statistics:** Mean , median, mode, frequency distribution, data analysis, etc.	5

References:

1. B.S.Grewal,"Elementary Engineering Mathematics",34 ed, 1998
2. H.K. Dass,"Advanced Engineering Mathematics", s.chand& company ,9 revised editiobn, 2001

Marks: 100

Course Code	Course Title	L - T - P : CR
CBC1202	Business Organization and Management	3 – 0– 0 : 3

UNIT	Contents / Topics	L. Hrs.
I	**Business** –Meaning and Contents, Business as a system, Business and Legal and Economic Environment, Forms of Business Organization (meaning, merits & demerits).	9
II	**Management**- Management Principles, Henry Fayol's principles of management, Taylor's Scientific Management, Management Process, Basic Functions (in short), Meaning, Nature and Process, Role of Manager. Organizational Behaviors-Need of Understanding human behaviour in organizations,Challenges and opportunities for OB, Contributing disciplines to the field of OB, Conceptual Models of OB	9
III	**Managing Personnel**- HRM- Meaning and Functions, Manpower Planning, Job Analysis and Design, Training, Career Planning & Development, Motivation, Compensation Management. Managing Finance-Concept of Fixed and Working Capital, Main Sources of Finance. Accounting: Meaning, Users, Budgeting- Meaning, Type of Budgets.	9
IV	**Managing Production**- Basic Concepts, Objectives, Elements of Productions, Planning and Control. Managing Sales and Marketing- Basic Concepts of marketing, Sales Promotions (including Salesmanship)	9

References:

1. Koontz and Weihrich, "Management - A global perspective", 10thEd., McGraw HillInternational Ed., 1993.
2. Chadha N.K., "Human Resource Management- Issues, Case Studies &ExperimentalExercises", 2000
3. John W. Newstrom and Keith Davis, "OrganisationalBehaviour–Human Behaviourat work", 10th Ed., 1997.
4. Maheshwari S.N and Maheshwari S.K, "An introduction to Accountancy", 5th Ed,Vikas publishing house Panneerselvam, Production and Operations Managmenet,PHI-1999

Marks:100

Course Code	Course Title	L - T - P : CR
CBC1203	Digital Electronics	3 – 0– 2 : 4

UNIT	Contents / Topics	L. Hrs.
I	**Number System and Codes:** Introduction, Number System and its conversion, Floating Point Representations of Numbers, Arithmetic Operations (Binary Arithmetic), 1's and 2's Compliment, 1's Compliment Subtraction, 2's Compliment Subtraction , Signed Binary number Representations, Addition and Subtraction using 2's compliment system.	9
II	**Boolean Algebra:** Basic Laws of Boolean algebra (Boolean addition, Boolean Multiplication, Properties of Boolean Algebra, Demorgans theorems, Sum of Products and Product of Sums, Expression from Truth Table, Karnaugh Map (Two variable, Three variable).	9
III	**Logic gates:** Logic gates (OR Gate, AND Gate, NOT Gate, NAND Gate, NOR Gate, Ex-OR Gate, Ex-NOR Gate). **Arithmetic Circuits:** Half Adder, Full Adder, Half-Subtractor, Full Subtractor, **Combinational Circuits:** Multiplixers, Basic four input multiplexer, Demultiplexers, 1 to 4 demultiplexer, Decoders, 3 to 8 decoder, Encoders.	8
IV	**Flip Flops:** Introduction, Flip Flops, Types of Flip-Flops, S-R Flip-Flop, D Flip-Flop, J-K Flip-Flop. **Memories:** Introduction, Classification of memories, Registers, Main Memories and Secondary Memory, Sequential Access Memory, RAM, ROM, Static and Dynamic Memory, Volatile and Non Volatile Memory, Magnetic and Semiconductor Memory, Basic Memory Structure.	10
V	**List of Experiments:** 1. Verification of the truth table of AND, OR and NOT Gates. 2. Verification of the truth table of NAND and NOR Gates. 3. Verification of the truth table of XOR using NAND Gates 4. Verification of the truth table of Half Adder Circuits using NAND Gates 5. Verification of the truth table of Full Adder Circuits using NAND Gates 6. JK Flip Flop verification. 7. D Flip Flop verification 8. SR Flip Flop verification	

References:

1. R.L.Tokheim, "Digital Electronics, Principles and Applications", Tata McGraw Hill,1999.
2. S.Salivahanan& S. Arivyhgan. "Digital circuits and design", Vikas Publication,2001
3. Malvino Leach, "Digital Principles and Application", TMH, 1999.
4. MALVINO," Digital Computer Electronics "TMH Publication ISBN 0-07-462235-8
5. MORRIS MANO," Computer System Architecture "PHI Publication ISBN 81-203-0417-9

Marks: 100

Course Code	Course Title	L - T - P : CR
CBC1204	Object Oriented Programming (C++)	4 – 0– 0 : 4

UNIT	Contents / Topics	L. Hrs.
I	**Introduction to Programming C++:** Object-Oriented Features of C++, Concept of Procedural, structured and object oriented programming. Concept of Encapsulation, Abstraction, Data hiding, Inheritance and Polymorphism. Data types, variable and constants, Expression and operators. Class and Objects, Data members and Member functions, Inline Functions, Comparing C with C++.	10
II	**Constructors & Destructors:** Roles and types of Constructors, Roles of Destructors. **Dynamic Memory Allocation**: new and delete Operators. Static Data Members and Member Functions, Friend Functions, Preprocessor Directives. **Branching Statements:** IF statement, if else, else If ladder, nesting of if else, switch statements.	10
III	**Looping Constructs**: for loop, while loop, do while loop. **Compile-Time Polymorphism**: Unary and Binary Operators overloading through Member Functions. **Console I/O:** Formatted and Unformatted I/O, Manipulators.	8
IV	**Inheritance, Virtual Function and Files:** single Inheritance, multilevel Inheritance, multiple Inheritance, hybrid Inheritance, hierarchical Inheritance. Virtual base class, abstract class, Virtual function and pure virtual function. **File handling:** opening and closing a file, detecting end of the file.	8

References:

1. Object Oriented Programming and C++, Balaguruswamy, TMH
2. Programming in C++, Shah &Thakker, ISTE/EXCEL
3. Object Oriented Programming and C++, R.Rajaram, New Age International

Marks: 100

Course Code	Course Title	L - T - P : CR
CBC1205	Database management system	3 – 0– 2 : 4

UNIT	Contents / Topics	L. Hrs.
I	**Basic Concepts:** Data, Information, Traditional file–based Systems. Database Approach, Characteristics of Database Approach, Database Management System (DBMS), Components of DBMS Environment, DBMS Functions and Components, Advantages and Disadvantages of DBMS. **Roles in the Database Environment:** Data and Database Administrator, Database Designers, Applications Developers and Users.	8
II	**Database System Architecture:** Three Levels of Architecture, External, Conceptual and Internal Levels. Schemas, Mappings, Data Independence: Logical and Physical Data Independence. Classification of Database Management System, Centralized and Client Server architecture to DBMS. **Data Models:** Records- based Data Models, Object-based Data Models, Physical Data Models and Conceptual Modeling.	9
III	**Entity-Relationship Model:** Entity Types, Entity Sets, Attributes Relationship Types and ER Diagrams, Keys: Primary key, Foreign key, entity Integrity constraints, Basic Concepts of Hierarchical and Network Data Model. **Relational Data Model:** Relational model concepts, relational algebra.	9
IV	**SQL**: SQL queries, DDL, DML. **Data Normalization:** Functional dependency, 1NF, 2NF, 3NF. **Concurrency Control and Recovery techniques:** Transaction processing, ACID properties, locking techniques, Database security.	10
V	**List of Experiments:** 1. DDL Commands Exercise 2. DML Commands 3. Functions 4. PL/SQL – Commit, Rollback and Save Points 5. PL/SQL – If – Case, Case Expression 6. PL/SQL – Loops and Exceptions 7. PL/SQL – Procedures Exercise	

References:

1. Database Systems and Concepts, Henry F. Korth
2. Database Management System by Bipin Desai
3. Principles of Database System, Ullman, Galgotia Publication

Marks:100

Course Code	Course Title	L - T - P : CR
CBC1291	Practical-II	0 - 0 – 4 : 2

Experiments	Content/ Topics	P.Hrs.
1	**Programs to demonstrate the usage of operators and data types in C++.** a. Write a program to print the size of all the data types supported by C++ and its range.	3
2	**Programs to demonstrate the use of class.** a. Programs to read and print a simple statement using Class. b. Program to create an employee structure and display the same.	2
3	**Programs to demonstrate the usage of if, if-else, nesting of if-else and else-if ladder.** a. Write a program to check whether the given number is even or odd. b. Write a program to find the largest among two numbers.	5
4	**Programs using while loop, do-while loop and for loop.** a. Write a program to print all prime numbers between any 2 given limits. b. Write a program to print all the Armstrong numbers between any 2 given limits.	5
5	**Programs using arrays-One Dimensional array, two Dimensional Array.** a. Program to create an array of 10 numbers. b. Program for searching number in an array.	4
6	**Programs using switch-case.** a. Write a program to count the different vowels in a line of text. b. Write a program to accept two numbers and perform various arithmetic operations (+, -, *, /) based on the symbol entered.	3
7	**Programs to demonstrate the usage of Constructor and Destructor functions.** a. Program to swap two number using Constructor. b. Program to implement destructor.	5
8	**Programs to demonstrate the use of Structures.** a. Create an employee structure and display the same. b. Create a student database storing the roll no, name, class etc. Implement modify and search operations.	3
9	**Programs using Inheritance** a. Program to show the implementations of different types of inheritance. b. Program to illustrate the use of public, private and protected access specifier.	4

References:

1. Object Oriented Programming and C++, Balaguruswamy, TMH
2. Programming in C++, Shah &Thakker, ISTE/EXCEL
3. Object Oriented Programming and C++, R.Rajaram, New Age International

Semester- III

Marks: 100

Course Code	Course Title	L – T – P : CR
CBC2101	Mathematics-III	3 – 0- 0 : 3

UNIT	Content / Topics	L. Hrs.
I	**LINEAR PROGRAMMING:** Formulation of Problem and solution techniques	10
II	**BUSINESS MATHEMATICS**: Profit & Loss, Sim.	8
III	**FOURIER SERIES:** Periodic Functions, Fourier Series, Fourier Series of Even and Odd Functions, Dirichlet Condition, Half Range Series.	8
IV	**ORDINARY DIFFERENTIAL EQUATIONS OF FIRST ORDER:** Variable-Separable Method, Homogeneous Differential Equations, Exact Differential Equations, Linear Differential Equations, Bernoulli's Differential Equations, Differential Equations of First Order and First Degree by Integrating Factor. **ORDINARY DIFFERENTIAL EQUATIONS OF SECOND ORDER:** Homogenous Differential Equations with Constant Coefficients, Cases of Complex Roots and Repeated Roots, Differential Operator, Solutions by Methods of Direct Formulae for Particular Integrals, Solution by Undetermined Coefficients, Cauchy Differential Equations, (only Real and Distinct Roots) Operator Method for Finding Particular Integrals	10

References:

1. R. K. Jain, SRK Iyengar, "Numerical Methods for Scientific & Engineering Computation", New Age International Pvt. Ltd., 3 Edition, 1999.
2. A.B. Mathur and V.P. Jaggi, "Advanced Engineering Mathematics", Khanna Publishers, 1999
3. H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Co., 9 Revised Ed., 2001
4. Numerical Methods – B.S Grewal,-KhannaPublishers , New Delhi.

Marks:100

Course Code	Course Title	L – T – P : CR
CBC2102	Computer Architecture	3 – 0- 0 : 3

UNIT	Content / Topics	L. Hrs.
I	**Register Transfer and Micro-operations:** Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic logic shift unit. **Basic Computer Organizations and Design:** Instruction Codes, Computer Registers, Computer Instructions, Timing and Control.	10
II	**Basic Computer Organizations and Design:** Instruction Cycle, Memory-Reference Instructions, Register reference instructions, Input-Output Instructions, Design of Accumulator Logic Shift Unit **Central Processing Unit:** Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes.	10
III	**Computer Arithmetic**: Introduction, Multiplication Algorithms, Division Algorithms, for fixed point-members. **Input-Output Organization:** Peripheral Devices, Input-Output Interfaces, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA)	10
IV	**Memory Organization:** Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware.	6

References:

1. WIliam Stallings, Computer Organization and Architecture, 4th Edition, Prentice Hallof India Private Limited, 2001
2. Harry& Jordan, Computer Systems Design & Architecture, Addison Wesley, Delhi,2000.
3. Malvino, "Digital Computer Electronics: An Introduction to Microcomputers", McGraw Hill, 1993
4. Computer Architecture and parrel processing by Kai Hwang and Faye' A. Briggs

Marks:100

Course Code	Course Title	L – T – P : CR
CBC2103	System Analysis and Design	4 – 0- 0 : 4

UNIT	Content / Topics	L. Hrs.
I	**System Concept:** Definition, Characteristics, Elements of system, Physical and abstract system, open and closed system, man-made information systems. **System Development Life Cycle:** Various phases of system development, SDLC Models: Waterfall model, iterative waterfall model, spiral model, prototyping model, RAD, Evolutionary model, Considerations for system planning and control for system success, Role of system analyst.	12
II	**System Planning:** Bases for planning in system analysis: Dimensions of Planning. **Initial Investigation:** Determining user's requirements and analysis, fact finding process and techniques. **Tools of structured Analysis:** Data Flow diagram, data dictionary, Gantt charts, pseudo codes, Flow charts, decision tree, decision tables. **Feasibility study:** Technical, Operational & Economic Feasibilities.	12
III	**Cost/Benefit Analysis:** Data analysis cost and benefit analysis of a system. Input/ Output and Form Design. **File Organization and database design:** Introduction to files and database, File structures and organization, objectives of database design, logical and physical view of data. **System testing:** Introduction, objectives of testing, types of testing, test planning, testing techniques.	12
IV	**Quality assurance:** Goal of quality assurance, levels of quality assurance. **System implementation and software maintenance:** primary activities in maintenance, reducing maintenance costs. **OO Analysis and Design:** Introduction to UML, OO Development Life Cycle and Modeling, Staticand dynamic modeling, Comparison of OO and Module-oriented Approach, Modeling using UML.	10

References:

1. Igor Hawryszkiewyez, Introduction to System Analysis and Design", 4th edition, Prentice-Hall.
2. Jeffrey L. Whitten, and Lonnie D. Bentey, Systems analysis and Design Methods", 4th edition, Tata McGraw-Hill

Marks:100

Course Code	Course Title	L – T – P : CR
CBC2104	Financial Accounting	3 – 0- 0 : 3

UNIT	Content / Topics	L. Hrs.
I	**Introduction:** Meaning and Nature of Financial Accounting, Scope of Financial Accounting, Financial Accounting & Management Accounting, Accounting concepts & convention, Accounting standards in India	8
II	**Basis of accounting-cash & accrual:** Journalizing transaction, Introduction to Ledger posting and trial balance, Capital and revenue items. Application of computers in accounting Accounting procedure used for recording cash, Bank and journal transactions using appreciate vouchers, Introduction to ledger accounting, Cash Book, Journal and bank account, Introduction to trial balance, Profit and Loss account and balance sheet.	10
III	**Financial statement analysis:** Ratio analysis, Funds flow analysis, concepts, uses, Preparation of funds flow statement, simple problem, Cash flow analysis, Concepts, uses, preparation of cash flow statement, simple problem, Break-even analysis	8
IV	**Inventory valuation:** Objectives, Introduction to FIFO, LIFO & Weighted Average method of inventory valuation, Valuation of inventory on balance sheet date, inventory accounting and control, Introduction to stocks & shares, Concept of cost of capital, introduction, importance explicit& implicit cost, Measurement of cost of capital, cost of debt. **Theory of working capital:** Nature and concepts.	10

References:

1. Gupta R. L., Gupta V. K., "Principles & Practice of Accountancy", Sultan Chand & Sons, 1999.
2. Khan& Jain, "Financial Accounting"
3. Maheshwari S. N., "Principals of Management Accounting", 11th Edition, Sultan Chand & Sons, 2001.
4. Shukla and Grewal, "Advanced Accounts", 14th Edition, Sultan Chand & Sons

Marks: 100

Course Code	Course Title	L – T – P : CR

CBC2105	Visual Programming With VB	4 – 0- 0 : 4

UNIT	Content / Topics	L. Hrs.
I	**Introduction to Visual Basic :**The Visual Basic Program Development Process; The Visual Basic Environment; Opening a Visual Basic Project; Saving a Visual Basic Project; Running a Visual Basic Project. **Visual Basic Fundamentals :** Numeric Constants; String Constants; Variables; Data Types and Data Declarations; Operators and Expressions; Hierarchy of Operations; String Expressions ;Library functions , Branching and Looping Statements, Relational Operators and Logical Expressions; Logical Operators; Branching with the if-Then Block; if-Then -Else Blocks; Selection: Select-case; Looping with for-Next; Do-Loop.	10
II	**Visual Basic Control Fundamentals :** Visual Basic Control Tools; Control tool Categories; Working with controls; Naming Forms and Controls; Assigning Property Values to Forms and Controls; Executing Commands(Event Procedures and Command Buttons); Display Output Data(Labels and Textboxes);Entering Input data(Text Boxes); selecting Multiple Features(Check Boxes); selecting Exclusive Alternatives, Assigning Properties Collectively, Generating Error Messages; Creating Times Events; Scrollbars. **Menus and Dialog Boxes :**Building Drop-down Menus; accessing a Menu from the Keyboard; Menu Enhancements; Submenus; Pop-up Menus; Dialog Boxes; Input Box.	10
III	**Executing and Debugging a New Project :** Syntax Errors; Logical Errors; Setting break Points; Defining Watch Values; Stepping Through a Program; User- Induced Errors; Error Handlers. **Procedures:** Modules and Procedures; Sub Procedure; Event Procedures; Function Procedures; Scope; Optional Arguments.	12
IV	**Arrays:** Array Characteristics; Array declarations; Processing Array Elements; Passing Arrays to Procedures; Dynamic Arrays; Array-Related Functions; Control Arrays. **Data Files:** Data File Characteristics, Accessing and Saving a File in Visual Basic, Processing a Data Files, Sequential Data Files, Random Access Data Files, Binary Files.	12

References:

1. Programming in VB by Julia case Bradley, Anita C. Millspaugh, TMH
2. Visual Basic 6.0 by Content Development Group , TMH
3. The Complete Reference Visual Basic 6 by Noel Jerks ,TMF

Marks:100

Course Code	Course Title	L - T - P : CR
CBC1291	Practical-III	0 - 0 – 4 : 2

Experiments	Content/ Topics	P.Hrs.
1	Programs to demonstrate the usage of operators and data types	3
2	Program to calculate Area of a Circle, cylinder, square.	2
3	Program to find Current date and Time.	2
4	Program to enter and display text.	2
5	Program to enter and display numerical and graphical data.	3
6	Program for selecting multiple features.	2
7	Program to Calculate Factorial of a number.	2
8	Program showing building of drop-down menus.	4
9	Program for error handling (Real Roots of a Quadratic Equation).	4
10	Program to show the accessing of Function Procedure(Calculate the factorial of n). Program to create an array, Sorting a list of numbers using an Array.	8

References:

1. Programming in VB by Julia case Bradley, Anita C. Millspaugh, TMH
2. Visual Basic 6.0 by Content Development Group , TMH
3. The Complete Reference Visual Basic 6 by Noel Jerks ,TMF

Semester-IV

Marks: 100

Course Code	Course Title	L – T – P : CR
CBC2201	Operational Research	3 – 0 - 0 : 3

UNIT	Content / Topics	L. Hrs.
I	**Introduction: Origin & development of O.R., Nature & Characteristics features of O.R., Models & Modeling in Operation Research. Methodology of O.R., General methods for solving O.R. Models, O.R. & Decision making, Application, Use & Limitations of O.R.**	**12**
II	**Linear Programming: formulation, Graphical, Big Method& Simplex Method, And Duality in L.P.: Conversion of Primal to Dual only Transportation Problems: Test for Optimality, Degeneracy in Transportation Problems. Unbalanced Transportation, Assignment Problems, Traveling Salesman Problem**	**12**
III	**Decision Making: Decision Making Environment, Decision under uncertainty, Decision under risk, Decision tree Analysis.** **Integer Programming and Dynamic Programming: Concept and Advantages only.**	**12**

References:

1. V.K.Kapoor- Operation Research
2. KantiSwarup- Operation Research
3. Hillier &Liberman – Introduction to Operation Research

Marks:100

Course Code	Course Title	L – T – P : CR
CBC2202	Data Structure	3 – 0- 2 : 4

UNIT	Content / Topics	L. Hrs.
I	**Introduction to Data Structure:** Basic concept of data, Problem analysis , algorithm complexity, Big O notation and time space trade off. **Array:** Representation of single and multidimensional arrays; Sprase arrays – lower and upper triangular matrices and Tridiagonal matrices with Vector Representation also.	10
II	**Stacks & Queues:** Basics of stacks and queues, Recursion, Polish notation, circular Queues, priority Queues.	8
III	**Linked Lists:** Single linked list, circular linked list, doubly linked list and dynamic storage management, generalized list, Garbage Collection. **Trees:** Definition & Concepts, Basic trees, Binary tree representations, threaded storage representation, binary tree traversals, and application of trees.	14
IV	**Searching and sorting:** use of various data structures for searching and sorting, linear and binary search, insertion sort, selection sort, merge sort, bubble sort, quick sort, Heap sort.	8
V	**List of Experiments:** 1. Implementation of Single Link list 2. Implementation of Double Link List 3. Implementation of Circular link list 4. Implementation of Stack 5. Implementation of Queue 6. Implementation of Linear Searching 7. Implementation of Binary Searching 8. Implementation of Sorting algorithms.	

References:

1.E.Horowiz and S.Sahani, " Fundamentals of Data structures", Galgotia Book source Pvt. Ltd., 2003

2.R.S.Salaria, " Data Structures & Algorithms" , Khanna Book Pblishing Co. (P) Ltd..,2002

3.Y.Langsam et. Al., " Data Structures using C and C++" , PHI, 1999

Marks:100

Course Code	Course Title	L – T – P : CR
CBC2203	Java Programming and website designing	4 – 0- 0 : 4

UNIT	Content / Topics	L. Hrs.
I	**Java Programming:** Introduction, JVM, variables, constants, Data types, control structured, arrays, strings, and vector, classes(inheritance, packages, exception handling), multithreaded programming,	8
II	Java applets, AWT controls (Button, Labels, Combo box, list and other Listeners, menu bar), layout manager, string handling (only main functions).	10
III	Networking (datagram socket and TCP/IP based server socket), event handling, Drivers in java, JDBC, ODBC connectivity (database connectivity).	8
IV	**HTML:** use of commenting, headers, text styling, images, formatting text with <FONT>,special characters, horizontal rules, line breaks, table, forms, image maps, <META> tags,<FRAMESET> tags, file formats including image formats.	14

References:

1.H.M.Dietel, P.J.Dietel, T.R.Neito, Internet and world wide web – how to program,Addison Wiley, 2000.
2.H.Schildt, "The complete Java 2 reference", TMH, 1998.
3.Shelley Powers, "Dynamic Web Publishing", 2nd Ed., Techmedia, 1998
4. Java The Complete Reference By Patrick Naughton And Herbert Schieldt.
5. Programming with Java by E. Balaguruswamy

Marks:100

Course Code	Course Title	L – T – P : CR
CBC2204	Operating System	4 – 0- 0 : 4

UNIT	Content / Topics	L. Hrs.
I	**Introduction:** what is an Operating System, Simple Batch Systems, Multi-programmed Batches systems, Time-Sharing Systems, Personal-computer systems, Parallel systems, Distributed Systems, Real-Time Systems **Memory Management:** Background, Logical versus Physical Address space, swapping, Contiguous allocation, Paging, Segmentation Virtual Memory: Demand Paging, Page Replacement, Page-replacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing, Other Considerations	12
II	**Processes:** Process Concept, Process Scheduling, Operation on Processes CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling. **Process Synchronization:** Background, The Critical-Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization.	12
III	**Deadlocks:** System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock. **Device Management:** Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices; Input or Output Devices, Storage Devices, Buffering, Secondary-Storage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Reliability.	12
IV	**Information Management**: Introduction, A Simple File System, General Model of a File System, Symbolic File System, Basic File System, Access Control Verification, Logical File System, Physical File System File-System Interface: File Concept, Access Methods, Directory Structure, Protection, Consistency Semantics. **File-System Implementation**: File- System Structure, Allocation Methods, Free-Space Management.	12

References:

1. Tannenbaum, “Operating Systems”, PHI, 4 Edition, 2000
2. J.L Peterson , A Siberschartz “Operating System Concepts” , II Edition, Addison Wesley , 1987
3. Milan Milenkovic “Operating System: Concepts and Design” II Edition, McGraw Hill, 1992
4. H.M. Deitel“ An Introduction to Operating Systems “ Addison Wesley , 1984
5.Madnick and II Donvan “Operating System” McGraw Hills

Marks:100

Course Code	Course Title	L – T – P : CR
CBC2205	Computer Network	4 – 0- 0 : 4

UNIT	Content / Topics	L. Hrs.
I	**Basic Concepts:** Components of data communication, distributed processing, standards and organizations. Line configuration, topology, transmission mode, and categories of networks. **OSI and TCP/IP Models:** Layers and their functions, comparison of models. Digital Transmission: Interfaces and Modems: DTE-DCE Interface, modems, cable modems. **Transmission Media:** Guided and unguided, Attenuation, distortion, noise, throughput, propagation speed and time, wavelength, Shannon Capacity, comparison of media.	12
II	**Error detection and correction:** ARQ, Flow and Error control, Many to one, one to many, WDM, TDM, FDM, circuit switching, packet switching and message switching. **Data Link control protocols:** Line discipline, flow control, error control, synchronous and asynchronous protocols, character and bit oriented protocols, Link access procedures. **Point to point protocols:** Transmission states, PPP layers, LCP, Authentication, NCP.	12
III	**Devices:** Repeaters, bridges, gateways, routers, The Network Layer, Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality of Service, Internetworking, Network-Layer in the Internet	10
IV	**Transport and upper layers in OSI Model:** Transport layer functions, connection management, Functions of session layers, Presentation layer, and Application layer.	10

References:

1.D. E. Comer, "Internetworking with TCP/IP", Pearson Education Asia, 2001

2.William Stallings, "Data and computer communications", Pearson education Asia, 7th Ed., 2002.

3. Berteakas and Galleger, " Data Networks" PHI

4. ScwartZ , "Telecommunication Network" Addison

Marks:100

Course Code	Course Title	L - T - P : CR
CBC2291	Practical-IV	0 - 0 – 4 : 2

Experiments	Content/ Topics	P.Hrs.
1	**Programs to demonstrate the usage of operators and data types.** a. Write a program to add two numbers. b. Write a program to subtract two numbers.	3
2	**Programs to demonstrate the use of class.** a. Programs to read and print a simple statement using Class. b. Program to create an employee structure and display the same.	2
3	**Programs to demonstrate the usage of if, if-else, nesting of if-else and else-if ladder.** a. Write a program to check whether the given number is prime or not. b. Write a program to find the largest of n numbers.	5
4	**Programs using while loop, do-while loop and for loop.** a. Write a program to print Fibonacci series. b. Write a program to demonstrate do while loop.	5
5	**Programs using arrays-One Dimensional array, two Dimensional Array.** a. Program to create an array of 10 numbers. b. Program for searching number in an array.	4
6	**Programs using switch-case.** a. Write a program to print result as per the percentage obtained.	3
7	**Programs to demonstrate the usage of Constructor.** a. Program to swap two number using Constructor.	5
8	**Programs to demonstrate the use of Structures.** a. Create an employee structure and display the same.	3
9	**Programs using Inheritance** a. Program to show the implementations of different types of inheritance. b. Program to illustrate the use of public, private and protected access specifier.	4

References:

1.H.M.Dietel, P.J.Dietel, T.R.Neito, Internet and world wide web – how to program,Addison Wiley, 2000.
2.H.Schildt, "The complete Java 2 reference", TMH, 1998.
3.Shelley Powers, "Dynamic Web Publishing", 2nd Ed., Techmedia, 1998
4. Java The Complete Reference By Patrick Naughton And Herbert Schieldt.

5. Programming with Java by E. Balaguruswamy.

Semester –V

Marks: 100

Course Code	Course Title	L – T – P : CR
CBC3101	Software Engineering	4 – 0- 0 : 4

UNIT	Content / Topics	L. Hrs.
I	**Introduction:**Software Crisis, Software Processes & Characteristics, Software life cyclemodels, Waterfall, Prototype, Evolutionary and Spiral Models. **Software Requirements analysis & specifications**: Requirement engineering, requirement elicitation techniques like FAST, QFD, requirements analysis using DFD, Data dictionaries& ER Diagrams, Requirements documentation, Nature of SRS, Characteristics &Organization of SRS.	**12**
II	**Software Project Management Concepts:** The Management spectrum, The People The Problem, The Process, The Project. **Software Project Planning:** Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, Risk Management.	**10**
III	**Software Design:** Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design **Software Metrics:** Software measurements: What & Why, Token Count, Halstead SoftwareScience Measures, Design Metrics, Data Structure Metrics,	**12**
IV	**Software Testing:** Testing Process, Design of Test Cases, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing. Debugging Activities. **Software Maintenance:** Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.	**10**

References:

1. Stephen R. Schach, "Classical & Object Oriented Software Engineering", IRWIN,1996.
2. James Peter, W. Pedrycz, "Software Engineering: An Engineering Approach", JohnWiley& Sons.
3. I. Sommerville, "Software Engineering", Addison Wesley, 2002
4. Roger Pressman , "Software Engineering" , McGraw Hill , Fifth Edition
5. W.S.Jawadekar , " Software Engineering" , TMH.

Marks: 100

Course Code	Course Title	L – T – P : CR
CBC3102	.Net Programming	4 – 0- 0 : 4

UNIT	Content / Topics	L. Hrs.
I	Introduction: Dot Net architecture, Dot Net framework, variable declaration, difference between C# and VB.Net, datatypes, Assemblies, object oriented features, memory management, interoperation with IOM, transaction in .NET, Structured exception handling, code access security.	12
II	VB.NET Similarities & differences with Visual Basic, windows focus, ADO.NET, working with databases, object oriented features. Arrays, array declaration and types, String, Conditional Structures, loop structures, functions, delegates and subroutine.	12
III	ASP.NET Similarities & difference with ASP, web-form, development, database interface. Types, objects and Name spaces.	12
IV	C++ .NET Similarities & differences with C/C++, Creating components, window forms, menus, validation, database interface.	12

References:

1 .RichardBlaur& Mathew Reynolds, "Beginning VB.net 2003", 3rd
Edition, WileyDream Tech., 2003
2. Chris Willman, John Kauffman, "Beginning ASP.net 1.1 with VB.NET 2003", WileyDream Teach, 2003
3. VB.Net BPB Publications PeTROUTSOS.
4. ASP.Net Bidle- MridulaParihar
5. Chris Ullman, John Kauffman, "Beginning ASP.NET with Visual #.net 2003", WileyDream Tech, 2003

Marks :100

Course Code	Course Title	L – T – P : CR
CBC3103	Internet Programming	3 – 0- 2 : 4

UNIT	Content/Topic	L.Hrs.
I	Internet Basic - Introduction to Html – List - Creating Table - Linking Document - Frames Graphics to HTML Doc - Style Sheet Basic - Add Style to Document - Creating Style sheet properties – Font - Text – List - Color and Background Color - Box-Display properties.	12
II	Introduction to Java Script - Advantage of Java Script Syntax - Data Type – Variable – Array - Operator and Expression - Looping Constructor – Function - Dialog Box	9
III	Internet Concepts: Internet Services, protocols-TCP / IP, HHTP, FTP, Internet Protocols-IPV4,IPV6. Networks: Internet, Intranets, Ethernet. Differences between internet and Intranet. IP Address: Classes, Subnet Mask and MAC address. DNS	10
IV	E-Mails: Structure of Email processing, Email Account, Internet Relay Chat (IRC), POP3, IMAP4 protocol.	9
V	**List of Experiments:** 1.Creating Web-Form 2.Implementation of array 3.Functions 4.Objects 5. Implementing Java Script in a form. 6. ODBC Connection. 7.Emailing Concepts. 8.Creating Email Account	8

References:

1. I. Bayross, Web Enable Commercial Application Development Using HTML, DHTML, Javascript, Perl, CGI, BPB publications, 2000.
2. J. Jawoskri, Mastering Javascript, BPB publications, 1999.
3. Margaret Levine Young – Internet - The Complete Reference - Millennium Edition – TMT Edition -1999.
4. Harley Hahn - The Internet – Complete Reference – Second Edition - TMH Edition. 30

Marks: 100

COURSE NO	COURSE TITLE	L - T - P : CR
CBC 3104	**MANAGEMENT INFORMATION SYSTEMS**	3 - 0 - 0 : 3

UNIT	CONTENTS/TOPICS	L.Hrs
I	Introduction: Definition, characteristics & significance of MIS. Introduction to business systems: payroll, inventory control, financial accounting, sales order processing, manufacturing plants etc. Information Concepts: Data Vs Information, types of information, quality of information. Decision Making: Simon's model of decision making, structured & unstructured decisions.	10
II	Database Management: Objectives, role, advantages & disadvantages of DBMS, SQL, use of databases for integration across functional areas. Introduction to Decision Support System	8
III	Design Methodology & Techniques: System development life cycle, software development models. System Analysis – SRS, DFD, DD & Decision tables. System Design – design methods, detailed system design, design documentation. System Implementation & testing.	10
IV	Implementation & Evaluation: Planning, organizing, testing & changeover. Evaluation approaches.	10

References:

1. D.P. Goyal : Management Information Systems. MacMillon.
2. Davis & Olson: Management Information Systems.
3. Murdick, Ross, & Clagett: Information Systems for Management.
4. Management Information System by W. S. Jawadekar TMG
5. Management Information System by James A. O.Brien TMG

Marks: 100

Course Code	Course Title	L- T- P: CR
CBC3105	Microprocessor System	3- 1- 0: 4

UNIT	Content/Topic	L.Hrs.
I	Microprocessors : Basic Concepts : What is a Microprocessor?; 4-8-16-32……; Evolution of Microprocessors; Organization of Microcomputers; Microprocessor Programming (Instructions, Machine and Mnemonic Codes, Machine and Assembly Language Programming, High Level Language Programming); Digital Logic (Digital and Analog Signals, Digital Building Blocks,Signal Levels, Device Loading, Open-Collector and Totem-Pole Devices); Timing Diagram Conventions.	10
II	Data Representations : Introduction; Positional Number Systems; The Binary Number System (Concepts; Binary to Decimal Conversion; Decimal to Binary Conversion); Representation of Integers (Positive Integers, Maximum Integer, Negative Number Representation, Minimum Integer, BCD Representation); Representation of Real Numbers ; Binary Arithmetic; Other Number Systems (Some Conventions); Character Representation.	12
III	Programming a Microprocessor: Introduction; Organization of the 8085 (Data and Address Busses, Addressing the I/O Devices, Registers in the 8085); Instruction Set of the 8085 (Instruction Types, Classification of Instructions, Addressing Modes, Space and Time Requirements).	10
IV	Microprocessor Timings: Introduction, Timing and Control Unit (Basic Concepts, The Fetch Operation, The Execute Cycle, Machine Cycle and State, Instruction and Data Flow); Timings of INTEL 8085 (8085 Buses, Opcode Fetch Cycle, Memory and I/O Read Cycles, Memory and I/O Read Cycles, Memory and I/O Write Cycles, Interrupt Timings, Interrupt Acknowledge Machine Cycle, Bus Idle Machine Cycle, The HALT and HOLD States, Initiating System Operation, State Transition Sequence.	10

References:

1.R.S .Gaonkar , " Microprocessor Architecture, Programming and Application" , Wiley Eastern Ltd, 1986
2.Douglas V. Hall, "Microprocessor and Digital Systems" , McGraw Hill , 1983.
3. Intel Marketing Communications "The 8080/8085 Microprocessor Book"' Wiley Interscience , 1980.
4. H. Taub B. " Digital and Microprocessors " , McGraw Hill, 1992

Marks: 100

Course Code	Course Title	L- T- P: CR
CBC3191	PRACTICAL-V	0- 0- 4: 2

UNIT	Content/Topic	P.Hrs.
1	Area of a Circle using VB.NET	3
2	Selecting exclusive alternatives (Temperature conversion) using VB.NET	5
3	Calculate Factorials using VB.NET	4
4	Building drop-down menus using VB.NET	5
5	create Registration form using ASP.NET	3
6	Create Signing form using ASP.NET	3
7	Create contact form using ASP.NET	4
8	Create booking form using ASP.NET	3
9	create Registration form using C++.NET	3
10	Create web browsing using C++.NET	3

References:

1.R.S .Gaonkar , " Microprocessor Architecture, Programming and Application" , Wiley Eastern Ltd, 1986
2.Douglas V. Hall, "Microprocessor and Digital Systems" , McGraw Hill , 1983.
3. Intel Marketing Communications "The 8080/8085 Microprocessor Book"' Wiley Interscience , 1980.
4. H. Taub B. " Digital and Microprocessors " , McGraw Hill, 1992

Semester-VI

Marls: 100

Course Code	Course Title	L- T- P: CR
CBC3201	Artificial Intelligence	3- 0- 0: 3

UNIT	Content/Topic	L.Hrs.
I	**Overview of A.I: Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success Problems.** **problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem Heuristic search techniques :Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction.**	10
II	**Knowledge representation: Definition and importance of knowledge, Knowledge representation, Various approaches used in knowledge representation, Issues in knowledge representation** **Using Predicate Logic : Representing Simple Facts in logic, Representing instances and is a relationship, Computable function and predicate.**	12
III	**Natural language processing :Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing** **Learning: Introduction learning, Rote learning, Learning by taking advice, Learning in problem solving, Learning from example-induction, Explanation based learning**	8
IV	**Expert System: Introduction, Repsenting using domain specific knowledge, Expert system shells.** **LISP and other AI Programming Language**	6

References:

1. D.W. Patterson, "Introduction to AI and Expert Systems", PHI, 1999
2. Nils J Nilsson ,"Artificial Intelligence- A new Synthesis" 2nd Edition (2000),
Harcourt Asia Ltd
3. “The Handbook of Artificial Intelligence” By Avron Barr, Addison – Wesley Publising Company, Inc , 1981
4. Artificial Intelligence A modern Approach , Second Edition by Stuart J. Russel and Peter Norvig ,Prentice-Hall of Indian Private Limited 2003.
5. Wireless Communication and Networks –by William Stallings , Person Education , Asia , 2002

Marks: 100

Course Code	Course Title	L- T- P: CR
CBC3202	Computer Graphics and Multimedia Applications	3- 0- 2: 4

UNIT	Content/Topic	L.Hrs.
I	Introduction: The Advantages of Interactive Graphics, Representative Uses of Computer Graphics, Classification of Applications, Development of Hardware and Software for Computer Graphics, Conceptual Framework for Interactive Graphics, Overview of Scan Converting Lines, Scan Converting Circles, Scan Converting Ellipses. Graphics Hardware: Hardcopy Technologies, Display Technologies, Raster-Scan Display Systems, The Video Controller, Random-Scan Display Processor, Input Devices for Operator Interaction, Image Scanners , Working exposure on graphics tools like Dream Weaver, 3D Effects etc. Clipping: Southland-Cohen Algorithm, Cyrus-Beck Algorithm, Midpoint Subdivision Algorithm.	14
II	Geometrical Transformations: 2D Transformations, Homogeneous Coordinates and Matrix Representation of 2DTransformations, Composition of 2D Transformations, the Window-to-Viewport Transformation, Efficiency, Matrix Representation of 3D Transformations, Transformations as a Change in Coordinate System.	12
III	Representing Curves & Surfaces: Polygon Meshes, Parametric Cubic Curves, Quadric Surfaces. Solid Modeling:Representing Solids, Regularized Boolean Set Operations, Primitive Instancing, Sweep Representations, Boundary Representations, Spatial Partitioning Representations, Constructive Solid Geometry, Comparison of Representations, User Interfaces for Solid Modeling.	10
IV	Introductory Concepts: Multimedia, Defintion, CD-ROM and the multimedia highway, Uses of Multimedia, Introduction to making multimedia – The stages of Project, the hardware & software requirements to make good multimedia, Multimedia skills and training, Training Opportunities in Multimedia, Motivation for Multimedia usage	10
V	**LIST OF EXPERIMENTS:** 1. Implementation of Line drawing algorithm-Bresenhams 2. Implementation of Line drawing algorithm-DDA 3. Implementation of circle drawing algorithm-Bresenhams 4. Implementation of Rotation algorithm. 5. Implementation of Translation algorithm. 6. Implementation of Reflection algorithm. 7. Line Clipping. 8. Polygon Clipping.	

References:

1.D. Harn& Baker: Computer Graphics, Prentice Hall of India, 1986.
2.D.J. Gibbs & D.C. Tsichritzis: Multimedia Programming Object, Environment &Framework, 2000
3.Foley, J.D. & Van Dam, A: Fundamentals of Interactive Computer Graphics.
4.Rogers& Adams, "Mathematical Elements for Computer Graphics", McGraw Hill,1989.
5.Tay Vaughan, "Multimedia: Making it Work", TMH, 2000

Marks:100

Course Code	Course Title	L- T- P: CR
CBC3203	Linux Environment	3- 0- 0: 3

UNIT	Content/Topic	L.Hrs.
I	UNIX & LINUX:- Overview of UNIX and LINUX Architectures editors and commands, shell scripts, system administration. LINUX Internals: Introduction, Data structures in LINUX kernel, process management, systems calls Memory Management: Architecture independent memory model, virtual address space for a process, block devices, caching, paging under LINUX.	12
II	Inter Process Communication: Synchronization in kernel, communication via files, pipes, ptrace, system V IPC, and sockets.	8
III	LINUX File System: Representation of file system in the kernel, Proc and Ext2 file system. Modules: -Modules in LINUX, debugging.	6
IV	Multiprocessing: Multiprocessing, symmetric multiprocessing, Changes with respect to kernel initialization, spooling, message exchange between processes, interrupt handling.	10

References:

1.B. W. Kernighan & R. Pike, "The UNIX Programming Environment", Prentice Hall of India, 2000
2. Cox K., "Red Hat Linux Administrator's Guide", PHI, 2001
3.UNIX- Concept & Application (Third Ed.)- Sumitabha Das, Tata McGraw Hill Publication.
4. UNIX for Programmers and users (Third Ed.) –Grahm Glass & King Ables. Pears Education India.
5.M. Beck, "LINUX Kernel Internals", Addison Wesley, 1997

Marks:100

Course Code	Course Title	L - T - P : CR
CBC3204	Practical-VI	0 - 0 – 4 : 2

Experiments	Content/ Topics	P.Hrs.
1	a. Installation of Unix/Linux operating system. b. Study of logging/logout details.	7
2	a. Study of Unix/Linux general purpose utility command list obtained from (man, who, cat, cd, cp, ps, ls, mv, rm, mkdir, rmdir, echo, more, date, time, kill, history, chmod, chown, finger, pwd, cal, logout, shutdown) commands. b. Study of vi editor.	4
3	a. Write a C program to emulate the UNIX ls-l command.	6
4	a. Write a shell script program to display "HELLO WORLD".	1
5	a. Write a shell Script program to check whether the given number is even or odd.	2
6	a. Shell script program to check whether given file is a directory or not.	2
7	a. Shell script program to count number of files in a Directory.	2
8	a. Shell script program to copy contents of one file to another.	2
9	a. Write a C program to display Largest of three numbers. b. Write a C program to find the Factorial of a given number.	6

References:

1.B. W. Kernighan & R. Pike, "The UNIX Programming Environment", Prentice Hall of India, 2000
2. Cox K., "Red Hat Linux Administrator's Guide", PHI, 2001
3.UNIX- Concept & Application (Third Ed.)- Sumitabha Das, Tata McGraw Hill Publication.
4. UNIX for Programmers and users (Third Ed.) –Grahm Glass & King Ables. Pears Education India.
5.M. Beck, "LINUX Kernel Internals", Addison Wesley, 1997

COURSE NO	COURSE TITLE	L - T - P : CR
CBC3205	Project Work	0 – 0– 4 : 2

COURSE NO	COURSE TITLE	L - T - P : CR
CBC3291	Project Seminar & Viva- Voce	0 – 0– 4 : 2

UNIT	CONTENTS/TOPICS	L.Hrs
I	The students are required to carry out a project on any Computer subject and submit a report to be evaluated by the teachers of the institute and a presentation made to the entire group.	

COURSE NO	COURSE TITLE	L - T - P : CR
	FIELD VISIT	0 – 0– 4 : 2