Vinoba Bhave University, Hazaribag

UNIVERSITY DEPARTMENT OF COMPUTER APPLICATIONS
VINOBA BHAVE UNIVERSITY, HAZARIBAG

COURSE STRUCTURE
CHOICE BASED CREDIT SYSTEM

The proposed CBCS system has the potential of providing a choice of a wide spectrum of subjects/branches of subjects to students in pursuit of achieving their cherished goals. This system has been globally accepted and now has become the need of the day. The UGC also has provided guidelines to the Universities for consideration and implementation of CBCS.

The University Department of Computer Applications proposes the following courses and credits to be initiated at BCA w.e.f. the session 2018 – 21. The proposed system may be modified/improved in future according to the requirements.

CORE Papers for BCA

Semester – I

Paper Code	Title	Credit	Marks
BCA F1001	Business Communications	4	100
BCA F1002	Basic Mathematics-I	5	100
BCA F1003	Business Practices And Management	4	100
BCA C1004	Introduction to Computer Science	4	100
BCA C1005	Problem Solving and Programming in C	5	100
Sessional			
BCA P1006	Computer Basics and PC Software Lab	1	50
BCA P1007	C Programming Lab	1	50
BCA P1008	Communication Skill Lab	1	50

Semester – II

Paper Code	Title	Credit	Marks
BCA F2001	Basic Mathematics II	4	100
BCA F2002	Environmental Science	4	100
BCA C2003	Database Management System	5	100
BCA C2004	Object Oriented Programming using C++	5	100
BCA C2005	Logic Design	4	100
Sessional			
BCA P2006	C ++ Programming Lab	1	50
BCA P2007	Database Management System Lab	1	50
BCA P2008	Circuit Design Lab	1	50

Semester – III

Paper Code	Title	Credit	Marks
BCA C3001	Data Structure using C	5	100
BCA C3002	Java Programming	4	100
BCA C3003	Computer Architecture	5	100
BCA C3004	System Analysis and Design	4	100
BCA C3005	Probability and Statistics	4	100
Sessional			
BCA P3006	Data Structure Lab	1	50
BCA P3007	Java Programming Lab	1	50
BCA P3008	Statistical Lab	1	50

Semester – IV

Paper Code	Title	Credit	Marks
BCA C4001	Multimedia	4	100
BCA C4002	Operating System	5	100
BCA C4003	HTML	4	100
BCA C4004	Visual Programming	4	100
BCA C4005	Computer Networks	5	100
Sessional			
BCA P4006	Multimedia Lab	1	50
BCA P4007	Visual Programming Lab	1	50
BCA P4008	HTML Lab	1	50

Semester – V

Paper Code	Title	Credit	Marks
BCA C5001	Internet Concept and Web Design	4	100
BCA C5002	Design and Analysis of Algorithms	5	100
BCA C5003	Linux Programming	5	100
BCA C5004	Computer Oriented Numerical Methods	4	100
	Elective – I	4	100
Sessional			
BCA P5005	Internet Concept and Web Design Lab	1	50
BCA P5006	Numerical Method Lab	1	50
BCA P5007	Linux Programming Lab	1	50

Semester – VI

Paper Code	Title	Credit	Marks
BCA C6001	Optimization Techniques	4	100
BCA C6002	Principle of Management	4	100
BCA C6003	Accounting and Financial Management	5	100
BCA C6004	Network Security	5	100
	Elective – II	4	100
Sessional			
BCA C6005	Project	2	100
BCA C6006	TALLY Lab	1	50

DATA STRUCTURE USING C (BCA C3001)

TIME-3 hr **FULL MARKS-70** **CREDIT-5**

The question paper shall consists of two sections: A and B. **Section A** will have eight (08) questions, out of which four (04) questions will be answered and will carry 10 marks each. **Section B** will consists of 10 short answer type questions which will cover the entire syllabus and will carry 30 marks in all., each short-answer type questions carrying 3 marks.

UNIT 1: INTRODUCTION TO DATA STRUCTURE

Representation of single and multidimensional arrays; Sprase arrays. **[Q-2]**

UNIT 2: LISTS

Introduction to linked lists; Linked list types, operations on linked list. **[Q-2]**

UNIT 3: STACKS AND QUEUES

Introduction and primitive operations on stack; Stack application; Infix, postfix, prefix expressions; Evaluation of postfix expression; Conversion between prefix, infix and postfix, introduction and primitive operation on queues. **[Q-2]**

UNIT 4: TREES

Introduction, Tree terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion, deletion; Binary Search Tree. **[Q-1]**

UNIT 5: m –Way TREES

Introduction, The invention of B-Tree; Statement of the problem; Indexing with binary search trees; a better approach to tree indexes; B-Trees; working up from the bottom; Example for creating a B-Tree.AVL tree. **[Q-1]**

UNIT 6: SORTING & SEARCHING TECHNIQUES

Sorting : Insertion sort, Selection sort, Merge sort, Bubble sort, Heap Sort

Searching Techniques: Linear search & Binary search

Text Book:

1. Seymour Lipschutz, Data Structure With C, Schaum's Outline Series, TMH, 2017
2.

REFERENTIAL BOOKS:

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 Publishing Co. (P) Ltd.., 2002
3. Y.Langsam ET. Al., "Data Structures using C and C++", PHI, 1999

JAVA PROGRAMMING (BCA C3002)

TIME-3 hr **FULL MARKS-70** **CREDIT-4**

The question paper shall consists of two sections: A and B. **Section A** will have eight (08) questions, out of which four (04) questions will be answered and will carry 10 marks each. **Section B** will consists of 10 short answer type questions which will cover the entire syllabus and will carry 30 marks in all., each short-answer type questions carrying 3 marks.

UNIT 1: JAVA EVOLUTION AND OVERVIEW OF JAVA LANGUAGE

How Java differs from C and C++, Java Tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command Line Arguments, Constants, Variables, Data Types, Scope of Variables, Symbolic Constants, Type Casting. **[Q-1]**

UNIT 2: OPERATORS AND Control Statements

Operators, Mathematical Functions, Decision Making, The switch Statement, The?: Operator, Loopoing Statements. **[Q-1]**

UNIT 3: CLASSES & OBJECTS

Defining a Class, Adding Variables, Adding Methods, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods, Inheritance: Extending a. Class, Overriding Methods, final Variables and Methods, Final Classes, Finalizer Methods, Abstract Methods and Classes, Visibility Control. **[Q-2]**

UNIT 4: ARRAYS, STRING AND VECTORS & INTERFACES

Arrays, Strings, Vectors, Wrapper Classes. Multiple Inheritances: Defining Interfaces, Extending Interfaces, implementing Interfaces, Accessing Interface Variables. **[Q-1]**

UNIT 5: PACKAGES & MULTITHREADED PROGRAMMING

Java API Packages, Using system Packages, Naming Conventions, Creating Packages, Accessing a Packages, Using a Package, Adding a Class to a Package, Hiding Classes.

Threads, Extending the Thread Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, and Synchronization. **[Q-2]**

UNIT 6: Exception Handling:

Types of Errors, Exceptions, Syntax of Exception Handling Code, Multiple Catch Statements, Using finally Statement, Throwing Our Own Exceptions, Using Exceptions. **[Q-1]**

TEXT BOOK:

1. E. Balagurusamy, Programming with Java, a Primer Second Edition, Tata McGrawHill, New Delhi.

REFERENCE BOOKS & WEBSITE:

1. H.M.Deitel & P.J.Deitel- JA V A- How to Program, 5th Edn, Pearson Education,NewDelhi-2004.
2. P.Naughton and H. Schildt-JAVA: The Complete Reference, TMH, New Delhi 2005.
3. www.spoken-tutorial.org, spoken tutorial IIT Bombay

COMPUTER ARCHITECTURE (BCA C3003)

TIME-3 hr **FULL MARKS-70** **CREDIT-5**

The question paper shall consists of two sections: A and B. **Section A** will have eight (08) questions, out of which four (04) questions will be answered and will carry 10 marks each. **Section B** will consists of 10 short answer type questions which will cover the entire syllabus and will carry 30 marks in all., each short-answer type questions carrying 3 marks.

UNIT 1:
Basic computer organization and design, Instructions and instruction codes, instruction cycle, Register/ Types of register/ general purpose & special purpose registers/ index registers, Register transfer and micro operations/ register transfer instructions, Bus/ Data transfer instructions, Arithmetic logic micro-operations/ shift micro-operations, Input/ Output and interrupts. **[Q-2]**

UNIT 2: CENTRAL PROCESSING UNIT
Stacks organizations instruction formats, addressing modes, Data transfer and manipulation. Program control reduced computer, pipeline/ RISC/ CISC pipeline vector processing/ array processing. **[Q-2]**

UNIT 3: COMPUTER ARITHMETIC
Addition, subtraction . Floating point representation , arithmetic operations, decimal arithmetic operations. **[Q-1]**

UNIT 4: INPUT – OUTPUT ORGANIZATION
Peripheral devices, Input/output interface, ALU Asynchronous Data transfer, mode of transfer, priority interrupts, Direct memory Address (DMA), Input/ Output processor (IOP), serial communication. **[Q-1]**

UNIT 5: EVALUATION OF MICROPROCESSOR
Overview of Intel 8085 microprocessors, Architecture and Interface, internal architecture, external architecture memory and input/ output interface.
Assembly language, Assembler, Assembly level instructions, macro, use of macros in I/C instructions, program loops, programming arithmetic and logic subroutines, Input-Output programming. **[Q-2]**

TEXT BOOK:
1. M. Mano, Computer System Architecture, Prentice Hall of India, 2017.

REFERENTIAL BOOKS:

1. Leventhal, L.A, “Introduction to Microprocessors”, Prentice Hall of India
2. Mathur, A.P., “Introduction to Microprocessors” , Tata McGraw Hill
3. Rao,P.V.S., “Prospective in Computer Architechture” , Prentice Hall of India

SYSTEM ANALYSIS AND DESIGN (BCA C3004)

TIME-3 hr **FULL MARKS-70** **CREDIT-4**

The question paper shall consists of two sections: A and B. **Section A** will have eight (08) questions, out of which four (04) questions will be answered and will carry 10 marks each. **Section B** will consists of 10 short answer type questions which will cover the entire syllabus and will carry 30 marks in all., each short-answer type questions carrying 3 marks.

UNIT 1: SYSTEM CONCEPTS:

Definition, Characteristics, Elements of system, Physical and abstract system, open and closed system. System development Life Cycle: Various phases of system development, Considerations for system planning and control for system success, SDLC Models. **[Q-3]**

UNIT 2: INITIAL INVESTIGATION & FEASIBILITY STUDY:

Determining user's requirements and analysis, fact finding process and technique. Determination of Feasibility Study, Technical, Operational & Economic Feasibilities, Data Analysis, Cost and Benefit Analysis. **[Q-1]**

UNIT 3: TOOLS OF STRUCTURED ANALYSIS:

Data Flow Diagrams, Data Dictionary, Decision Trees, Decision Tables, Gantt charts, Structured English (Structured Query) and Pseudo code. **[Q-2]**

UNIT 4: User Manual, Programming manual, Operator manual, Software testing, Quality Assurance and Quality Control, Software maintenance and Software risk management, Threat and Risk Analysis. **[Q-2]**

TEXT BOOK:

1. V.K. Jain, System Analysis and Design, 2010, DreamTech Press.

REFERENCE BOOKS:

1. Perry Edwards, Systems Analysis & Design,2010, McGraw Hill.

PROBABILITY AND STATISTICS (BCA C3005)

TIME-3 hr **FULL MARKS-70** **CREDIT-4**

The question paper shall consists of two sections: A and B. **Section A** will have eight (08) questions, out of which four (04) questions will be answered and will carry 10 marks each. **Section B** will consists of 10 short answer type questions which will cover the entire syllabus and will carry 30 marks in all., each short-answer type questions carrying 3 marks.

UNIT 1: PROBABILITY

Introduction, Events & Different Types of Events, Addition & Multiplication Law, Conditional Probability, Bay's Theorem. **[Q-2]**

UNIT 2: PROBABILITY DISTRIBUTION

Random Variables, Probability Function, Binomial Poison & Normal Distribution. **[Q-1]**

UNIT3: STATISTICS & MEASURES OF CENTRAL TENDENCY

Definition, Function & Scope of Statistics. Arithmetic Mean, Weighted A.M., Median, Mode, Geometric & Harmonic Mean and Their Merits & Demerits. **[Q-1]**

UNIT 4: MEASURES OF VARIATION: Range, The Interquartile Range or Quartile Deviation, Average(Mean), Deviation Standard Deviation, Coefficient of Variation, Skew ness, Moments &Kurtosis. **[Q-1]**

UNIT 5: CORRELATION ANALYSIS: Introduction, Karl Pearson's Coefficient of Correlation, Rank Correlation Coefficient. **[Q-1]**

UNIT 6: REGRESSION ANALYSIS: Difference Between Correlation & Regression, Regression Lines,Regression Equations, Regressions Coefficient. **[Q-1]**

UNIT 7: SAMPLING DISTRIBUTION:

Chi Square *(X2)* Distribution and Its Properties, Chi - Square Test, Application of Chi -Square Distribution: Chi-Square Test for Population Variance, Chi-Square Test of Goodness of Fit, Independence of Attributes, T- Distribution & Its Properties,Application of T - Distribution to Testing Hypothesis About Population Mean, Differencen Between Two Means, Correlation Coefficient, F- Distribution. **[Q-1]**

TEXT BOOKS:

1. S.P. Gupta & M.P. Gupta, "Business Statistics", Sultan Chand & Sons.

REFERENCE BOOKS:

1. S.C. Gupta & V.K. Kapoor ,"Fundamental of Mathematical Statistics", Sultan Chand & Sons.

DATA STRUCTURE LAB (BCA P3006)

TIME-3 hr **FULL MARKS-50** **CREDIT-1**

Experiment problems of Data and File Structure lab will be from the theory classes of BCA C3001

JAVA PROGRAMMING LAB (BCA P3007)

TIME-3 hr **FULL MARKS-50** **CREDIT-1**

Experiment problems of Data and File Structure lab will be from the theory classes of BCA C3002

STATISTICAL LAB (BCA P3008)

TIME-3 hr **FULL MARKS-50** **CREDIT-1**

Experiment problems of statistical lab will be from the theory classes of BCA C3005