CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT,ODISHA

SCHOOL OF APPLIED SCIENCES

COURSE STRUCTURE AND SYLLABUS

FOR

BCA

(BACHELOR IN COMPUTER APPLICATIONS)

2017-18

CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT, ODISHA

BACHELOR IN COMPUTER APPLICATIONS (BCA)

DETAIL SYLLABUS FOR BCA 1st YEAR UNDER CBCS

SEMESTER-I

Sl no	Subject Code	Subject	Contact Hours per week (L+T+P)	Credits
1	FCBS0101	AECC-1 ENVIRONMENTAL SCIENCE	0+0+2	2
2	CCCS0409	OFFICE AUTOMATION	4+0+3	6
3	CCCS0410	FUNDAMENTALS OF COMPUTERS	4+0+3	6
4		GE-1 Inter Disciplinary Subject	Subject Specific	6
		TOTAL CREDITS		20
		TOTAL CUMULATIVE CREDITS		20

SEMESTER-II

Sl no	Subject Code	Subject	Contact Hours per week (L+T+P)	Credits
1	BSFL1101	AECC-2 ENGLISH	0+0+2	2
2	CCCS1201	COMPUTER ORGANIZATION AND SYSTEM ARCHITECTURE	4+0+3	6
3	CCCS1202	PROGRAMMING IN 'C'	4+0+3	6
4		GE-2 Inter Disciplinary Subject	Subject Specific	6
		TOTAL CREDITS		20
		TOTAL CUMULATIVE CREDITS		40

Generic Elective Subjects-

Inter Disciplinary Subject

**Generic Elective Subjects to be chosen from discipline other than BCA
- GE-1 to GE-4(Subjects from BBA & BSC -MATH)**

Sl No	Subject Code	Subject Name	Subject Type (L+T+P)	Credits
1	BSMA1102	LINEAR ALGEBRA	4-0-3	6
2	BBAR2101	Human Resource Management	5+1+0	6
3	BBAR2202	OPERATION RESEARCH	5+1+0	6
4	BBAR3202	ENTREPRENEURSHIP DEVELOPMENT	5+1+0	6

Semester: 1

FCBS0101:Environmental Science (2+0+0)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
FCBS0101	Environmental Science	NIL	THEORY	2	0-0-2

Course Objectives:
1. To understand the concept of multi-disciplinary nature of Environmental Science where different aspects are dealt with a holistic approach.
2. Students will develop a sense of community responsibility by becoming aware of environmental issues in the larger social context.
3. One must be environmentally educated.

MODULE-I Environment and its multidisciplinary nature; Need for public awareness; Renewable and non -renewable resources–forest, water, mineral, land, food and energy resources; Structure and function of ecosystems of forest, grass land, desert and aquatic types.

MODULE -II Biodiversity and its conservation: Biodiversity at global, national and local levels; Threats to biodiversity - Habitat loss; wild life poaching and man - wildlife conflicts; Endangered and endemic species; conservation measures. Causes, effects and control measures of pollution, air, water and noise pollution; Nuclear hazards; solid-waste management–Causes, effects and control measures; Management of disasters due to natural causes of floods, earthquakes, cyclones and landslides.

MODULE-III Social issues and the environment; Sustainable environment, Water conservation measures; Rain water harvesting; Resettlement and rehabilitation of people; Climate change and global warming; Acid rain; Ozone layer depletion; water land reclamation; Consumerism and waste products; Features of Environment Protection Act, Air pollution and Control of Pollution Acts; Water Pollution and its Control Act. Effects of Pollution explosion on environment and public health; Need for value education to Protect environment and resources.

Learning Outcomes: 1. Understand the natural environment and its relationships with human activities. 2. Characterize and analyze human impacts on the environment.
3. Integrate facts, concepts, and methods from multiple disciplines and apply to environmental problems. 4. Design and evaluate strategies, technologies and methods for sustainable management of environmental systems and for the remediation or restoration of degraded environments.

Text Book: 1. Anubhav Kaushik & C.P. Kaushik: Environmental Studies-New age International Publishers.

Reference Books: 1. Benny Joseph: Environmental Studies-Tata Mac Graw Hill

2. E. Bharucha: Text book of Environmental Studies for under graduate courses– Universities Press. (Book prepared by UGC Committee

CCCS0409: OFFICE AUTOMATION (4+0+3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
CCCS0409	OFFICE AUTOMATION	NIL	THEORY & PRACTICE	6	4-0-3

MODULE -I

Learning MS-Word - 20 Hrs

Introduction to Office Automation, Creating & Editing Document, Formatting Document, Autotext, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmarks, Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

MODULE - II
Learning MS-Excel - 20 Hrs

Introduction to MS-Excel, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, Pivot table & Pivot Chart, Linking and Consolidation, Sorting, Filtering, Table, Validation, Goal Seek, Scenario.

MODULE - III
Learning MS-PowerPoint – 10 Hrs

Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

Text Books: 1. Microsoft Office – Complete Reference – BPB Publication
                    2. Learn Microsoft Office – Russell A. Stultz – BPB Publication

INTRODUCTION TO OFFICE AUTOMATION LAB

- Experiments based on Theory.

CCCS0410: FUNDAMENTALS OF COMPUTERS (4+0+3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
CCCS0410	FUNDAMENTALS OF COMPUTERS	NIL	THEORY & PRACTICE	6	4-0-3

Module 1 (**20 hours**)

Computer Basics: A simple model of computers, Digital and Analog Computers, Evolution of digital computers, Major Components of a digital computer, hardware, software, firmware, middleware, freeware. Input/output Devices: Input Devices, Output Devices, Printers, and Plotters, Other forms of Output devices, Input and Output port.

Number System: Decimal Number System, Binary Number System, conversion of numbers(binary to decimal, decimal to binary), Addition of Binary Numbers, 1's complement and 2's complement representation of numbers, Binary Subtraction, Binary Multiplication, Binary Division, Hexadecimal and octal number system, ASCII and ISCII code, EBCDIC code, Gray codes, Fixed point and Floating Point Representation, Overflow and Underflow.

Logic Circuits: Switching circuits, AND/OR operations, NOT operations, Boolean Functions, Canonical Forms of Boolean Functions, Logic circuits.

Module 2 (12 hours)

Processor: CPU organization, Structure of Instruction, A machine level language

Computer Memory: Read only memory, Serial Access memory, Main memory, Secondary memory: Magnetic hard disk, Floppy disk Drives, Compact Disk Read Only memory, Magnetic tape Drives. Computer Architecture: Interconnection of units, Processor to memory communication, I/O to processor communication, Interrupt Structure, Multiprogramming, Processor Features, RISC, Virtual Memory.

Module 3 (18 hours)

Computer Languages: Programming Language, Introduction to Interpreter and compiler, Assembly Language, Higher Level Languages

Operating System: Need of an OS, Batch operating system, multiprogramming Operating system, Time sharing Operating System, personal computer Operating system, on-line and real time system. Computers and Communications: Computer Generations, Types of communications with and among computers, internet and world wide web, characteristics of communication channels, Physical Communication Model, Computer Network topologies, Local Area Network.

Text Book:

1.Fundamentals of Computers, by V.Rajaraman (chapter 1,2,3,4,5,6,7,8,9,10,12,13)

2.**Reference Books:**

1.Computer Fundamentals, by B.Ram

2.Computer Fundamentals by P.K.Sinha

3. Fundamentals Of Information Technology, 2nd Edition, Alexis Leon, Mathew Leon,Vikas Publishing House Pvt Ltd.

FUNDAMENTALS OF COMPUTERS- LAB

Experiment 1: Introduction to computer and connectivity of different functional units.

Experiment 2: Identification of various components of a computer and its functions.

Experiment 3: Identification of various power supply units and peripheral units and their functions.

Experiment 4: Hardware Troubleshooting.

Experiment 5: Installation of operating Systems (Windows & Linux)

Experiment 6: Installation of Ms Office, Turbo C and other essential application software in windows.

Experiment 7: Installation of Software in Linux Platform.

Experiment 8: Internet Basics: Browsing, Mailing, Domain Name Systems (DNS)

Experiment 9: Basic DOS commands

Experiment 10: Basic Linux commands

GE-1-LINEAR ALGEBRA

Semester: 2

BSFL1101: ENGLISH

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BSFL1101	English	NA	THEORY	2	2-0-0

Module-I: Communication Skill Communication:
Definition, concept Channels of Communication: Sender, receiver, channel, message, encoding, decoding, context, feedback Verbal & Non-Verbal Communication: Spoken & written-advantages & disadvantages, Bias free English, Formal & informal style.

Module-II: Communicative Grammar :
Time, Tense & Aspect Verbs of state & events Modality Active & Passive voice Antonyms, Synonyms, Homonyms, one word substitutions & correction of errors

Module-III: Sounds of English:
 Length of vowels: Long vowels as in the words feel, food, shoot, card etc. Short vowels as in the words pen, sun, cut, shut, etc. Consonants Stress pattern Intonation: Rising & Falling.

Text Books: Effective technical communication by M.A.Rizvi
Reference Books:
1. Communicative English & Business Communication by R.K.Panda, J.Khuntia, M.Pati, Alok Publication.
2. Communicative Grammar of English Geoffery Leech

CCCS1201: COMPUTER ORGANIZATION & SYSTEM ARCHITECTURE (4-0-3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
CCCS1201	Computer Organization and System Architecture	NIL	THEORY AND PRACTICE	6	4-0-3

MODULE –I

Basic structures of Computers: Functional units, Bus structures, Computer Architecture vs Computer Organization.

Addressing Methods and Machine Program Sequencing: Memory Locations, Addressing and encoding of information, Main memory operations, Instructions and instruction sequencing, Addressing modes, Assembly language

MODULE –II

Processing Unit: Fundamental concept, Execution of complete instruction, Hardwires control, Performance considerations, Micro programmed control.

Memory: Basic concepts, Semiconductor RAM memories, Read only memories, speed, Size and cost, Cache memories, Performance considerations, Virtual memories, Memory management requirements. Input, Output Organization: Accessing I/O devices, Interrupts, Direct memory access, I/O hardware, Standard I/O interfaces.

MODULE –III

Arithmetic: Number representations, Addition of positive numbers, Design of fast adders, Signed addition and subtraction, Arithmetic and branching conditions, Multiplication of positive numbers, Signed-operand multiplication, Fast multiplication, Integer division, Floating-point numbers and operations.

Text Books:
Books Recommended:
1. V.C. Hamacher, Z.G. Varanesie & S.G. Zaky- Computer Organization, Mc Graw Hill International.

Reference Books
1.M. Mano- Computer System Architecture, Prentice Hall of India
2.J.P. Hayes – Computer Architecture and Organization, Mc Graw Hill International.

Computer Organization and System Architecture Lab:

- Experiments based on Theory.

CCCS1202: PROGRAMMING IN C (4-0-3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
CCCS1202	PROGRAMMING IN C	NIL	THEORY AND PRACTICE	6	4-0-3

MODULE-I

Problem solving techniques: Algorithms, Flow charts, Pseudo codes, Structured programming-sequence, selection and iterations.

Introduction to C: Overview of C, Structure of C program, Character set, Identifiers, Keywords. Constants, Variables Data Types: Size and range of data types, type conversions.

Operators: Arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bit-wise operators, assignment operators, expressions, precedence and order of evaluation. **Managing Input and Output:** I/O functions: printf, scanf, getchar, putchar, gets, puts etc.

MODULE-II

Decision Making and Branching: if, if-else, if-else-if, nested if and switch statements.

Loop Control Structures: while, do-while and for loops. Jumping statements: goto, break, continue, return, and exit.

Arrays: declaration, definition, accessing elements of one dimensional and two-dimensional arrays and applications.

Strings: String Manipulation and String handling functions.

Functions: Types of functions, prototype declaration, definition, parameter passing, recursive functions, storage classes - extern, auto, register, static, scope rules.

MODULE-III

Derived data types: Structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, Union and typedef, bit fields.

Introductions to pointers: Pointer arithmetic, Pointers to arrays, Pointers to functions, Pointers to structures, Self referential Structures. Pointers to pointers, pointers and multidimensional arrays, command line arguments.

File management in C: Input and output, concept of a file, text files and binary files, streams, standard I/O, Formatted I/O, file I/O operations, error handling.

Text Books:
1. Byron Gottfried, "Programming with C" TMH Publications
2. Ashok and Kamthane 'Computer Programming" Pearson Education.

Reference Books:
1. E. Balaguruswamy "Programming in C", Tata McGraw Hill-3rd edition
2. B.W. Kernighan & D.M. Ritchie, "C Programming Language", PHI.
3. T Jeyapoovan, A First Course in Programming with C, Vikas Publishing House Pvt Ltd.

Programming in C Lab
- Experiments based on Theory.

GENERIC ELECTIVES: BCA

FCBS0407: LINEAR ALGEBRA

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
FCBS0407	LINEAR ALGEBRA	NIL	THEORY AND PRACTICE	6	4-0-3

Module-I Vector spaces, definition and examples, subspaces, span of aset, linear dependence and independence, dimension and basis.

Module-II Linear transformation, definition and examples, range and kernel, rank and nullity, the space L(U,V), composition of Linear maps, matrix and linear map, linear operations, matrix multiplication, rand and nullity of matrix, transpose of a matrix.

Module-III Elementary row operations, Systems of linear equations, matrix inversion, determinants, minors and rank of a matrix, product of determinants, application to linear equations, Eigen value and Eigen vector.

LINEAR ALGEBRA LAB

List of Practical (Using any software) Practical/ Lab work to be performed on a Computer.
1. Matrix addition and multiplication.
2. Matrix Inversion and Transpose.
3. Eigen Values and Eigen vectors of Matrix
4. Solution of AX=B using Gauss Elimination, GaussSeidal, Gauss-Jacobi and Gauss methods

Text Book:

1.An Introduction to Linear Algebra by V. Krishnamurty,V.P.Mainra, J.L.Arora, Affiliated East-West press Pvt.Ltd. Chapters: 3,4 (4.1 to 4.7), 5,6 (6.5 to 6.8)

Reference Books:

1) Basic Structures in Algebra, Part-I : J.N. Patnaik
2) Matrix Theory and Linear Algebra : I.N. Herstein and D.J. Winter (Ma Chilan Publishing company)
 3) First course in Linear algebra : Bhattacharya, Jain and Nagpaul (New Age International)

Human Resource Management
Credit – 5+1+0(6)

CODE: BBMG2203

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BBMG2203	Human Resource Management	NIL	THEORY	6	5-1-0

Course Contents:

Unit-I: Concept Nature and scope of Human Resource Management vis-a-vis Personnel management. Growth in and development of human resources management in India, Role and functions of personnel manager.

Unit-II : Human Resource planning, Labour market consideration, Characteristics of Indian labour market, Recruitment and selection, The employment exchange

(compulsory notification of vacancies) Act, 1959, Sources of labour Supply,
Selection procedure, Tests and interview, Induction.

Unit-III: Promotion : Purpose, Types of promotion, Promotion policies. Programme and procedure, Seniority vs. Merit, Transfer, Purpose, Transfer policy and procedure.

Unit-IV: Training in organization : Its objectives, Methods of assessment of training needs. Different types of training programmes. On the job and off the training. Purpose training policy procedure.

Unit-V: Performance Appraisal : Its objectives, uses and methods, Traditional vs. Modern methods, Management by Objectives (MBO), Quantity Management TQM, Kaizn, JIT, QC and BPR.

Books Recommended:
1. Pattanaik B - Human Resource Management, PHI
2. E.B. Flippo-Personnel Management
3. C.B. Mamoria - Personnel Management.
4. C.S. Venkata ratnam & B. K. Srivastava - Personnel Management Human Resources
5. R. Armstrong- Human Resources Management
6. Fisher Schenfeldt & Shaw - Huamn Resource Management
7. P. Subba Rao - Human Resources Management - Texts & Cases.

ENTREPRENEURSHIP DEVELOPMENT

Credit-6   **CODE: BBAR3202**

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BBAR3202	Entrepreneurship Development	NIL	THEORY	6	5-1-0

Course Contents:
Unit-I: Entrepreneurship: General concept, Definition, Entrepreneurial, culture, Theory of entrepreneurship, Types of entrepreneurship, entrepreneurial trade and motivation, Entrepreneur and professional manager.

Unit-II: Environment and entrepreneurial development : Entrepreneur environment, process of entrepreneurial Development, training of entrepreneur institutions, producing aids for an entrepreneurial development.

Unit-III: Project Appraisal and Management search for business ideas, project identification and formulations, project appraisal, Profitability and risk analysis, and Sources of finance, Role of consultancy organization.

Unit-IV: Legal and statutory Environment in setting of a small industry, Basics of vacancies Act, our job laws, government set up in promoting small financial institution, export - import rules.

Unit-V: Location of an enterprise, Factane design and layout, Setting quality standard steps in starting a small industry, incentive and subsidies, Problems in small enterprise Management, Sickness and Preventions.

Books Recommended:

1. Dynamics of Entrepreneurial Development and Management, Vasanta Desai HPH

2. Entrepreneurship Development, Colombo Plan Staff College of Technical Education (Adapted By Center for research and Industrial Staff Performance, Bhopal) Tata Mcgraw Hill. New Delhi -1998.

OPERATION RESEARCH

Credit-6   **CODE: BBAR2202**

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BBAR2202	Operation Research	NIL	THEORY	6	5-1-0

Course Contents:

Unit-I: Linear Programming, simple methods, revised simple method, duality in LPP.

Unit-II: Post optimality analysis in LPP Parameter, LPP Linear fractional programming.

Unit-III: Transportation problem, Assignment problem sequences.

Unit-IV: Games and strategies. Integer Programming and decision analysis.

Unit-V: Nullity - Objective, decision-making, Interactive and non interactive methods.

Books Recommended:
1. Swarup Gupta and Mohan -Operation Research. Sultan Chand and Sons. N.D. 2001.
2. J.K. Sharma, Quantitative Techniques, Macmillan, Delhi
3. Handly, Non-Linear Dynamic Programming.

CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT,ODISHA

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COURSE STRUCTURE AND SYLLABUS

FOR

BCA 2ND Year

CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT, ODISHA

BACHELOR IN COMPUTER APPLICATIONS

DETAIL SYLLABUS FOR BCA 2ND YEAR UNDER CBCS

SEMESTER-III					SEMESTER-IV				
Sl no	Subject Code	Subject	Contact Hours per week (L+T+P)	*Credits*	Sl no	Subject Code	Subject	Contact Hours per week (L+T+P)	*Credits*
1		Skill-1	0+0+3	2	1		Skill-2	0+0+3	2
2	BCAC2301	INTRODUCTION TO DATASTRUCTURE	4+0+3	6	2	BCAC2401	PROGRAMMING IN C++	4+0+3	6
3	BCAC2302	RDBMS	4+0+3	6	3	BCAC2402	OPERATING SYSTEM CONCEPTS	4+0+3	6
4	BCAC2303	FUNDAMENTALS OF ALGORITHM DESIGN AND ANALYSIS	5+1+0	6	4	BCAC2403	COMPUTER COMMUNICATION AND NETWORKING	4+0+3	6
5		GE-3	Subject Specific	6	5		GE-4	Subject Specific	6
TOTAL CREDITS				**26**	**TOTAL CREDITS**				**26**
TOTAL CUMULATIVE CREDITS				**66**	TOTAL CUMULATIVE CREDITS				**92**

Skill Enhancement Courses (02 papers) (Credit: 02 each)- SEC1 to SEC2

Sl No	Subject Code	Subject Name	Subject Type (L+T+P)	Credits
1	BCAS2001	Computer Hardware and Maintenance	0+0+3	0
2	BCAS2002	Advance Linux Administration	0+0+3	2
3	BCAS2003	PHP Programming	0+0+3	2
4	BCAS2004	Programming with Visual Basics in Visual Studio .NET	0+0+3	2

Sl No	Subject Code	Subject Name	Subject Type (L+T+P)	Credits

INTRODUCTION TO DATA STRUCTURE (4+0+3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAC2301	INTRODUCTION TO DATA STRUCTURE	PROGRAMMING IN C	THEORY+ PRACTICE	6	4-0-3

MODULE-I (25 HRS)

Introduction to Data Structures: Data Structures, Need of data structure, Computer Memory, Algorithm, Pseudo code for expressing algorithms, time complexity and space complexity.

Linear Structures of Array: Memory representation, Implementation and application, sparse matrix, Advantages and Disadvantages of array

Sorting and searching: Bubble, Selection, Insertion, linear search, binary search

Stack: Memory representation, implementation and application of stack (Conversion from Infix to Postfix, Evaluation of postfix expressions), Disadvantages of stack

Queue: Queues: Memory representation, implementation and application of a queue, Priority Queues, Circular Queues. Advantages and Disadvantages of queues

Link list: Memory representation, implementation and application, Linked stacks and queues, operations on Polynomials, Doubly Linked Lists, Circularly Linked Lists. Advantages and

Disadvantages of linked list.

MODULE-II (20 HRS)

Tree: Concept of tree: Definition : Tree, Binary tree, Complete binary tree, Binary search tree, : Root, Node, Degree of a node and tree, Terminal nodes, Non terminal nodes, Siblings, Level, Edge, Path, depth, Parent node, ancestors of a node. Binary tree: Array representation of tree, Creation of binary tree. Traversal of Binary Tree: Preorder, Inorder and postorder.

MODULE-III (5 HRS)

Graphs: Terminology & Representations, Graphs & Multi-graphs, Directed Graphs, Sequential Representations of Graphs, Adjacency Matrices, Traversal.

Text Books:

1. Data Structures: Seymour Lipschutz

Reference Books:

1. Data Structures in C by Tanenbaum.

2. Fundamentals of Data Structure by Sahany

3.Data Structures, by Tremblay and Sorenson.

4. Data Structure & Algorithms using C ,Amitav Nag and J P Singh, 2nd Edition, Vikas Publishing House Pvt Ltd.

PRACTICAL

1. Write a Program to Traverse an Array.
2. Write a Program to Insert and delete an Item into an Array.
3. Write a program to search an element using sequential search.
4. Write a program to search an element using binary search.
5. Write a program to implement stack operation using array.
6. Write a program to convert an infix to postfix notation using stack.
7. Write a program for stack implementation using linked list.
8. Write a program to implement queue operation using array.
9. Write a program to implement circular queue operation using array.
10. Write a program for queue implementation using linked list.
11. Write a program to implement link list (creation, insertion, deletion).
12. Write a program to implement circular link list (creation, insertion).
13. Write a program to implement double link list (creation, insertion).
14. Write a program to construct binary tree.
15. Write a program to traverse (in order, preorder, post order any one .
16. Write a program to sort N number of elements using bubble sort.
17. Write a program to sort N number of elements using quick sort.
18. Write a program to sort N number of elements using merge sort.
19. Write a program to sort N number of elements using selection Sort.
20. Write a program to sort N number of elements using insertion Sort.

RDBMS (4+0+3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAC2302	RDBMS	NIL	THEORY+ PRACTICE	6	4-0-3

MODULE I:
Introduction to Database Systems and File Based Systems: Database Systems, Common uses of Database Systems, File Based Approach, Limitations of File Based Approach, File-oriented Systems vs. Database Systems (Most of the topics will be through power point presentation; Demonstration of File oriented System and Database System)

Database Approach: Database, Database Management System (DBMS), Database Application Programs, Components of DBMS Environment, Advantages and Disadvantages of DBMS. (Most of the topics will be through power point presentation)
Roles in Database Environment: Data and Database Administrators (DBA), Database Designers, Application Developers, End-Users. (Most of the topics will be through power point presentation)
MODULE-II:
Database System Architecture: Three Level Architecture, External Level, Conceptual Level, Internal Level, Schemas, Mappings, and Instances, Data Independence, Data Abstraction, (Most of the topics will be through power point presentation)
Database Languages: Data Definition Language (DDL), Data Manipulation Language (DML). (Most of the topics will be through power point presentation.)
Data Models and Conceptual Modelling: Data models, E-R models, Relational models, Network and Object Oriented Data models, Mapping E-R model to Relational model. (Most of the topics will be through practice mode)
Normalization: Normal forms: 1NF, 2NF, 3NF (Most of the topics will be through practice mode)
MODULE -III:
Terminologies of Relational Model: Relational Data Structure, Mathematical Relations, Database Relations, Properties of Relations, Relational Keys, Representing Relational Database Schema.
Integrity Constrains and Views: Nulls, Entity Integrity, Referential Integrity, General Constraints, Views, Purpose of Views.

SQL: Introduction: Objectives of SQL, Writing SQL Command. SQL: Data Definition: Data Definition, Creating a Database, Table Operations (Create, Alter, and Drop), Creating an Index, Removing an Index.SQL: Data Manipulation: Simple Queries, Sorting Results (Order By), Aggregate Functions, Join, Grouping Results (Group By) Query-By-Example: Introduction to QBE, Building Select queries using QBE.

TEXT BOOKS:

1. Database Systems By Thomas M. Connolly and Carolyn E. Begg - Pearson Education-4th, edition (Chapters: 1, 2, 3, 5, 6, 7.1, 7.2, 11, 13)

2. Fundamentals of Database System By Elmasari & Navathe - Pearson Education-5th, Edition.

REFERENCE BOOKS:

1. An introduction to Database System - Bipin Desai, Galgotia Publications

2. Database System: concept, Design & Application - S.K.Singh (Pearson Education)

3. Fundamentals of Database Management System – Gillenson, Wiley India

4. Database System Concepts - Sudarshan, Korth (McGraw-Hill Education) -6th, edition

PRACTICAL

1. Introduction to Database and Database languages.

2. Use of SQL syntax: insertion, deletion using SQL.

3. Use of SQL syntax: updation, modification using SQL.

4. Programs on join statements and SQL queries including where clause.

5. Programs on procedures and functions.

6. Programs on database triggers.

7. Programs on packages.

8. Programs on data recovery using check point technique.

9. Concurrency control problem using lock operations.

10. Programs on JDBC and ODBC using database.

FUNDAMENTALS OF ALGORITHM DESIGN AND ANALYSIS (5+1+0)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAC2303	FUNDAMENTALS OF ALGORITHM DESIGN AND ANALYSIS	NIL	THEORY	6	5-1-0

MODULE-I

Introduction to analysis and design of algorithm, Growth of functions, Asymptotic notations, Recurrences, Solution of recurrences by substitution, Recurrence tree and the master method. Divide and conquer algorithms (Worst case analysis of merge sort, quick sort and heap sort algorithms), Priority queue, Data structure for disjoint sets (Disjoint set operations, linked list representation, disjoint set forests)

MODULE-II

Dynamic programming approach: Matrix chain multiplication, longest common subsequence. Greedy method: Fractional knapsac problem Greedy verses dynamic programming, Huffman codes. Concept of backtracking, branch & bound design techniques. Graph algorithms: Minimal spanning tree (Kruskal and Prim's algorithms), Single source shortest paths (Bellman-Ford and Dijkstra's algorithm), Floyd's algorithm.

MODULE –III

Flow Network, Ford-Fulkerson method, Fast Fourier Transform, Rabin-Karp string matching algorithm. NP-Completeness, Polynomial time solvability, Verification and Reducibility, NP complete problems (without proof), Approximation algorithm for the traveling salesman problem.

Text book:
 1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and L.Stein, "Introduction to Algorithms" , Second
Edition, PHI Learning, 2002
Chapters: 1, 2, 3, 4(excluding 4.4), 6, 7 (7.4.1), 15(15.2, 15.3. 15.4), 16(16.1, 16.2, 16.3),
21(21.1, 21.2, 21.3) 23, 24(24.1, 24.2, 24.3), 26(26.1, 26.2), 30(30.1, 30.2), 32(32.1, 32.2), 34,
35(35.2)

Reference books:
 1. E. Horowitz, S. Sahani, S. Rajsekharan, "Fundamentals of Computer Algorithms", Second
Edition, Universities Press, 2007
 2. J. Kleinbers, E.Tardos, Algorithm design, Pearson Education Inc., New Delhi , 2006
 3. R. Johnsonbaugh, M. Schaefer, "Algorithms", Pearson Education Inc., New Delhi , 2004
 4. Kenneth A. Berman & Jerome L. Paul, "Algorithms", Revised Edition, 2005, CENGAGE
Learning India Pvt. Ltd., New Delhi.
 5. Anany V. Levitin, "Introduction to the Design and Analysis of Algorithms", Second Edition,
2007, Pearson Education Inc., New Delhi.
 6. Michael T. Goodrich and Roberto Tamassia, "Algorithm Design: Foundations, Analysis,
and Internet Examples", 2nd Edition, Wiley India Pvt. Ltd., New Delhi

SKILL SUBJECTS:

SEC: Computer Hardware and Maintenance (0+0+3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAS2001	COMPOUTER HARDARE AND MAINTENANCE	NIL	PRACTICE	2	0-0-3

MODULE I (15 HRS)
Computer System, Cases, Power Supplies, Internal Components, Ports and Cables, Input and Output devices,
 System Resources.
Safety Guidelines: ESD, MSDS, Hardware Tools: ESD Tools, Hand tools, Cleaning tools, Diagnostic tools.
Software Tools: Fdisk, chkdsk, defrag, disk cleanup, SFC , Antivirus program, Spyware remover, firewall
Step by Step Computer Assembly.

MODULE II (20 HRS)
Preventive maintenance and troubleshooting process, purpose of data protection, gathering details from
customer, verifying obvious issues, gathering data from computers, quick solutions, closing with the customer.
Installing an OS, OS: purpose, limitation, compatibility, common preventive maintenance techniques, Trouble
shooting an OS Laptops, PDAs and Smartphones, Common preventive maintenance techniques, Trouble
shooting Laptops and portable devices.
Printers and scanners: Different types, installation and configuration process, working of laser printer,
common preventive techniques, Trouble shooting printers and scanners.
MODULE III (15 HRS)
NETWORKING: Types of networks, LAN, WAN, WLAN, Basic networking concepts and technologies,
Physical components of a network, LAN Topologies, Standard Organization, Ethernet Standards, OSI and
TCP/IP data models, Configuring a NIC, Modem, Other technologies to establish connectivity, Trouble shooting
a network
Network Security: Security Threats, Security procedures, Common Preventive Maintenance for security,
Trouble shooting security.
TextBook:
   1. IT Essentials, 4th Edition by Cisco Press

SEC: ADVANCE LINUX ADMINISTRATION (0+0+3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAS2002	ADVANCE LINUX ADMINISTATION	NIL	PRACTICE	2	0-0-3

MODULE I (10 HRS)

Linux – The Operating System, Open Source Software, GNU, GNU Public License, Advantages of Open Source Software, Difference between Windows and Linux. Installing Linux, Hardware and Environmental Considerations, Server Design, Dual- Booting Issues, Methods of Installation, Installing Fedora.

MODULE II (20 HRS)

Common Commands, Clocks, Daemons, Hardware, Host Information, Installation, Mail, Managing File systems, Managing the Kernel, Networking, Printing, Security and system Integrity, Starting and Stopping the System, System Activity and Process Management, Users, Miscellaneous. Overview of Networking – TCP/IP Administration, NFS and NIS Administration.

MODULE III (20 HRS)

Boot Methods – The Boot Process, LILO, GRUB, Dual-Booting Linux and Windows XP/Vista, Boot-Time Kernel Options. The Bash Shell – Features, Invoking the Shell, Syntax, Functions, Variables, Arithmetic Expressions, Command History, Job Control, Command Execution, Restricted Shells, Built-in Commands

Text Book:

1. Ellen Siever, Stephen Figgins, Robert Love, Arnold Robbins, "Linux in a Nutshell", O' Reilly.

2. Wale Soyinka, "Linux Administration: A Beginner's Guide", McGraw Hill Companies.

SEC:PHP PROGRAMMING (0+0+3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAS2003	PHP PROGRAMMING	NIL	PRACTICE	2	0-0-3

MODULE I (15 HRS)
Introduction to PHP: Basic Syntax, Variable, Constant, data type, Operator and expression
HTML Form: Capturing form data, multi value field, generating file upload form, redirecting a form after Submission, making decisions, loops

MODULE II (15 HRS)
Function, String handling functions, Array, Library functions, files and directories, Opening and closing a file Coping, renaming and deleting a file, file uploading and downloading

MODULE III (20 HRS)
Hidden field, Cookies, Session, String Matching, Pattern Matching, Replacing Text, Splitting a string with a regular expression. Creating and manipulating images, Using text in image.

TextBook:
   1. PHP: A Beginner's Guide – by Vikram Vaswani

Reference:
1. Learning PHP, MySQL, JavaScript, and CSS: A Step-by-Step Guide to Creating Dynamic Websites – by Robin Nixon

SEC: PROGRAMMING WITH VISUAL BASICS in Visual Studio .NET (0+0+3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAS2004	PROGRAMMING WITH VB IN .NET	NIL	PRACTICE	2	0-0-3

MODULE I (15 HRS)

Introduction to Visual Basic, IDE and its Components, VB Data type, Variable Scope, Module, Conditional Statement, Looping, Procedure, Function, Event, Forms Controls (Property, Event, Method) Control Array, Dilogbox (MsgBox ( ), InputBox()), MDI form, Menu (Standard Module, MDI).

MODULE II (15 HRS)

Introduction to Activex control, Common Dialog Control, File Operation. Draw (Line, Circle, Box, Ellipse), Animations, Graphical Command Button

MODULE III (20 HRS)

Introduction to Database, Bound Control and UnBound Control, Recordset, Types of Connectivity (DAO, RDO, ADO), Introduction to Data Report, Design Data Report, Group Report.

Text Books
1. Mastering Visual Basic – Evangelos petroutsos - BPB Publication
2. Visual Basic – Garry Coprnel –Tata McGraw-Hill.

Generic Elective (GE)-3
Credits- 6
- Students can choose a generic elective from other discipline.

DETAIL SYLLABUS FOR BCA 2ND YEAR UNDER CBCS

Semester: IV

PROGRAMMING IN C++ (4+0+3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAC2401	PROGRAMMING IN C++	PROGRAMMING IN C	THEORY + PRACTICE	6	4-0-3

MODULE-1 Introduction to OOPs and C++ Element - 20 Hrs

Introduction to OOPs, Features & Advantages of OOPs, Different element of C++ (Tokens, Keywords, Identifiers, Variable, Constant, Operators, Expression, String).

Sequential Constructs, Decision Making Construct, Iteration / Loop Construct, Arrays, Functions (User defined Function, Inline Function, Function Overloading), User Defined Data Types (Structure, Union and Enumeration).

MODULE - 2 Class, Object, Constructor & Destructor – 20 Hrs

Class, Modifiers (Private, Public & Protected), Data Member, Member Function, Static Data Member, Static Member Function, Friend Function, Object, Constructor (Default Constructor, Parameterized Constructor and Copy Constructor), Destructor.

Pointer (Pointer to Object, this Pointer, Pointer to Derive Class), Introduction to Polymorphism (Runtime Polymorphism, Compiletime Polymorphism), Operator Overloading, Virtual Function, Inheritance (Single Inheritance, Multiple Inheritance, Multilevel Inheritance, Hierarchical Inheritance, Hybrid Inheritance), Virtual Base Class, Abstract Class.

MODULE – 3 File Handling, Exception Handling - 10 Hrs

Files I/O, Exception Handling (Exception Handling Mechanism, Throwing Mechanism, Catching Mechanism, Re-throwing an Exception).

Text Books:
1. E. Balguruswamy, "Object Oriented Programming with C++", TMH Publisher.
2. A.N. Kamthane, "Object Oriented Programming with ANSI & Turbo C++", Pearson Education
Reference Books:
3. Behrouz A. Forouzan& Richard F. Gilberg "A Structured approach using C++" Cengage Learning Indian Edition.
4. BjarneStroustrup, "C++ Programming Language", Pearson Education,
5. Object-Oriented Programming with ANCI & TURBO C++ : Kamthane

PRACTICAL

1. WAP to print the sum and product of digits of an integer.
2. WAP to reverse a number.
3. WAP to compute the sum of the first n terms of the following series
   $S = 1+1/2+1/3+1/4+……$

4. WAP to compute the sum of the first n terms of the following series

       S =1-2+3-4+5…………….

5. Write a function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not.

6. Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.

7. WAP to compute the factors of a given number.

8. Write a macro that swaps two numbers. WAP to use it.

9. WAP to print a triangle of stars as follows (take number of lines from user):

               *

              ***

             *****

            ****

           ****

10. WAP to perform following actions on an array entered by the user:
   i) Print the even-valued elements
   ii) Print the odd-valued elements
   iii) Calculate and print the sum and average of the elements of array
   iv) Print the maximum and minimum element of array
   v) Remove the duplicates from the array
   vi) Print the array in reverse order
   The program should present a menu to the user and ask for one of the options. The menu should also include options to re-enter array and to quit the program.

11. Create Matrix class using templates. Write a menu-driven program to perform following Matrix operations (2-D array implementation):

   i) Sum b) Difference c) Product d) Transpose

12. Create the Person class. Create some objects of this class (by taking information from the user). Inherit the class Person to create two classes Teacher and Student class. Maintain the respective information in the classes and create, display and delete objects of these two classes (Use Runtime Polymorphism).

13. Create a class Triangle. Include overloaded functions for calculating area. Overload assignment operator and equality operator.

14. Create a class Box containing length, breath and height. Include following methods in it:
   i) Calculate surface Area
   ii) Calculate Volume
   iii) Increment, Overload ++ operator (both prefix & postfix)
   iv) Decrement, Overload -- operator (both prefix & postfix)
   v) Overload operator == (to check equality of two boxes), as a friend function
   vi) Overload Assignment operator
   vii) Check if it is a Cube or cuboid
  Write a program which takes input from the user for length, breath and height to test the above class.

15. Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.

16. Write a program to retrieve the student information from file created in previous question and print it in following format:

Roll No. Name Marks

17. Copy the contents of one text file to another file, after removing all whitespaces.
18. Write a function that reverses the elements of an array in place. The function must accept only one pointer value and return void

OPERATING SYSTEM CONCEPTS (4+0+3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAC2402	OPERATING SYSTEM CONCEPTS	NIL	THEORY + PRACTICE	6	4-0-3

MODULE-I (20 Hours)
INTRODUCTION TO OPERATING SYSTEM:
What is an Operating System? Simple Batch Systems, Multiprogramming and Time Sharing systems Parallel Systems, Distributed Systems and Real time Systems.
Operating System Structures: Operating System Services, System components, Protection system, Operating System Services, system calls.
PROCESS MANAGEMENT:
Process Concept, Process Scheduling, Operation on Processes, Inter-process communication, Examples of IPC Systems, Multithreading Models, Threading Issues, Process Scheduling Basic concepts, scheduling criteria, scheduling algorithms, Thread Scheduling.

MODULE-II (20 Hours)
PROCESS COORDINATION: Synchronization: The Critical section problem, Peterson's solution, Synchronization hardware, Semaphores, Classical problems of synchronization.
Deadlocks: System model, Deadlock Characterization Methods for Handling Deadlocks, Deadlock Prevention, Deadlock avoidance, Deadlock Detection, recovery from Deadlock.
MEMORY MANAGEMENT: Memory Management strategies, Logical versus Physical Address space, swapping, Paging, Segmentation.
Virtual Memory: Background, Demand paging, performance of Demand paging, Page Replacement, Page replacement algorithms. Allocation of frames, Thrashing, Demand Segmentation.

MODULE-III (10 Hours)
STORAGE MANAGEMENT:
File System Concept, Access Methods, File System Structure, File System Structure, File System Implementation, Directory implementation, Efficiency and Performance, Recovery, Overview of Mass Storage Structure, Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management.
CASE STUDIES: The LINUX System, Windows XP, UNIX system.

TEXT BOOK:
1. Operating System Concepts – Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, 8th edition, Wiley-India, 2009.
2. Modern Operating Systems – Andrew S. Tanenbaum, 3rd Edition, PHI
3. Operating Systems: A Spiral Approach – Elmasri, Carrick, Levine, TMH Edition
REFERENCE BOOK:
1. Operating Systems – Flynn, McHoes, Cengage Learning
2. Operating Systems – Pabitra Pal Choudhury, PHI
3. Operating Systems – William Stallings, Prentice Hall
4.Operating Systems, - Rohit Khurana, 1st Edition, Vikas Publishing House Pvt Ltd.

PRACTICAL

1. Detail anatomy of Operating System.
2. Basic DOS Commands and its Use.
3. Basic UNIX / LINUX commands and its Use.
4. Study of different editors in LINUX (vi, gedit, etc.)
5. Detail study of File Access Permission in LINUX.
6. Simulation of CPU Scheduling Algorithms. (FCFS, RR, SJF, Priority, Multilevel Queuing).
7. Simulation of Banker's Algorithm for Deadlock Avoidance, Prevention.
8. Program for FIFO, LRU, and OPTIMAL page replacement algorithm.

COMPUTER COMMUNICATION AND NETWORKING (4+0+3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAC2403	COMPUTER COMMUNICATION AND NETWORKING	NIL	THEORY + PRACTICE	6	4-0-3

MODULE-I   (15 HRS)
Overview of Computer Networks:
Introduction: OSI, TCP/IP and other networks models, Examples of Networks: Novell Networks, Arpanet, Internet, Network Topologies WAN, LAN, MAN.
Physical Layer: Transmission mode, Transmission Media: Guided Media, Unguided media (wireless), Multiplexing: FDM, WDM, TDM, Circuit switching and Telephone Network: Circuit switching, Telephone network.

MODULE-II (15 HRS)
Data link layer: Design issues, framing, error detection and correction, CRC, Elementary Protocol-stop and wait, Sliding Window, Data link layer in HDLC,ATM.
Point-to –Point Access: PPP, Multiple Access Protocols: Random Access, Controlled Access, Channelization.
Local area Network: Ethernet.
Wireless LANs: IEEE 802.11, Bluetooth virtual circuits

MODULE-III (20 HRS)
Network Layer : addressing and Network Layer Protocols: ARP, IPV4, ICMP, IPV6 ad ICMPV6, Broad cast, Multi cast, Congestion, Control Algorithms – General Principles of Congestion prevention policies. Internetworking: The Network layer in the internet and in the ATM Networks.
Transport Layer: Process to Process Delivery: UDP; TCP congestion control.
Application Layer:
Client Server Model, Domain Name System (DNS): Electronic Mail (SMTP) and file transfer (FTP) HTTP and WWW.

Text Books:
1. Data Communications and Networking: Behrouz A. Forouzan, Tata McGraw-Hill, 4thEd
3. Computer Networks: A. S. Tannenbum, D. Wetherall, Prentice Hall, Imprint of Pearson 5thEd
Reference Book : .
1. Computer Networks:A system Approach:Larry L, Peterson and Bruce S. Davie,Elsevier, 4thEd
2. Computer Networks: Natalia Olifer, Victor Olifer, Willey India

3. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition,
   Pearson Education

4. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose and Keith W. Ross

, 2nd Edition, Pearson Education, 2002.

PRACTICAL
Some Network protocol simulation using NetSim, NS2, etc. for

1. Analysing bus vs. star-switch with respect to number of collisions (for a fixed number of transmitting nodes) for Ethernet LAN

2) Analysing number of transmitting nodes vs. collision count, mean delay for Ethernet LAN

3) Analysing performance of token ring with number of nodes vs. response time, mean delay using NetSim.

4) Comparing the throughput and normalized throughput for token ring and token bus for different transmitting nodes.

5) Comparing the CSMA/CD vs. CSMA/CA protocols (for a fixed number of transmitting nodes).

6) Analysing the difference between unicast and broadcast transmission (for a fixed number of transmitting nodes).

7) Verification of stop-and-wait protocol.

8) Verification of Go-back-N protocol.

9) Verification of Selective repeat protocol.

10) Verification of distance vector and link state routing algorithm.

Generic Elective (GE)-4

Credits- 6

- Students can choose a generic elective from other discipline.

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CENTURION UNIVERSITY OF TECHNOLOGY ANDMANAGEMENT,ODISHA

SCHOOL OF APPLIED SCIENCES

COURSE STRUCTURE AND SYLLABUS

FOR

BCA 3RD Year

CENTURION UNIVERSITY OF TECHNOLOGY AND MANAGEMENT, ODISHA

BACHELOR IN COMPUTER APPLICATIONS
DETAIL SYLLABUS FOR BCA 3RD YEAR UNDER CBCS

SEMESTER-V					SEMESTER-VI				
Sl no	Subject Code	Subject	Contact Hours per week (L+T+P)	Credits	Sl no	Subject Code	Subject	Contact Hours per week (L+T+P)	Credits
1	BCAC3501	INTERNET AND WEB TECHNOLOGY	4+0+3	6	1	BCAC3601	INTRODUCTION TO SOFTWARE ENGINEERING	5+1+0	6
2	BCAC3502	PROGRAMMING IN JAVA	4+0+2	6	2	BCAC3602	DOT NET TECHNOLOGY	4+0+2	6
3		DSE-1	Subject Specific	6	3		DSE-3	Subject Specific	6
4		DSE-2	Subject Specific	6	4		DSE-4	Subject Specific	6
TOTAL CREDITS				**24**	**TOTAL CREDITS**				**24**
TOTAL CUMULATIVE CREDITS				**116**	TOTAL CUMULATIVE CREDITS				**140**

Discipline Specific Elective Courses (04 papers) (Credit: 06 each)- DSE 1 to DSE 4

Sl No	Subject Code	Subject Name	Subject Type (L+T+P)	Credits
1	BCAD3001	Programming using python	4+0+3	6
2	BCAD3002	Cryptography and Network Security	5+1+0	6
3	BCAD3003	Cyber Crime and Law	5+1+0	6
4	BCAD3004	Principles of MIS	5+1+0	6
5	BCAD3005	Data Mining and Ware Housing	5+1+0	6
6	BCAD3006	Enterprise Resource Planning	5+1+0	6
7	BCAD3007	Dissertation/ Project	5+1+0	6

INTERNET AND WEB TECHNOLOGY (4+0+3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAC3501	INTERNET AND WEB TECHNOLOGY	NIL	THEORY + PRACTICE	6	4-0-3

MODULE-I (20 HRS)
Introduction to the Internet and the World Wide Web, WebPages; Hyper Text Transfer Protocol (HTTP);
File Transfer Protocol (FTP) Domain Names; URL; Website, Web browser, Web Servers; Web Hosting.
HTML
Introduction, Objectives, Introduction to Universal Resource Identifier (URI),
History of HTML,
Structure of HTML Basic Tags of HTML, Planning for designing Web pages, Model and structure for a Website,
 Developing Websites,.
Tag;
Creating Links: Link to other HTML documents and same HTML documents.
List, Tables: Creating Tables, Frames, Forms.
MODULE- II (20 HRS)
JAVA Script
JavaScript: Introduction to Scripting, JavaScript: Control Statements, JavaScript: Functions,
JavaScript: Arrays JavaScript: Objects.
CSS
External Style Sheets, Internal Style Sheets, Inline Style, The class selector, div & span tag
MODULE-III (10 HRS)
DOM
HTML DOM, XML: Introduction; Features of XML, Dynamic HTML (DHTML), DHTML form, XML DOM.
CGI/PERL
Introduction to CGI, Testing & Debugging Perl CGI Script.
Textbooks
1. Web Warrior Guide to Web Design Technologies, Don Gosselin, Joel Sklar& others, Cengage Learning
Reference Books
1. Web Programming: Building Internet Applications, Chris Bates, Wiley Dreamtech
2. Programming the World Wide Web, Robert W Sebesta, Pearson
3. Web Technologies, Uttam K Roy, Oxford
4. Web Technology: A developer perspective, Gopalan&Akilandeswari, PHI

INTERNET AND WEB TECHNOLOGY LAB

Describe the use and function of the following
i) HTTP ii) TELNET iii) FTP iv) SMTP
2. Create your first web page using HTML basic Tags.
3. Create a web page with the following constrains
I) an clickable image ii) a hyperlink to your collage web site
iii) a table of marks of B Sc class student.
4. Create your student web **Form** for the entry of Student's information.
5. Create a complete web page using Frame.
6. Validate the registration and user login in a web site using JavaScript.
7. Design a digital clock on your web page using Java script.
8. Basics of CGI scripting using Perl or C.
9. Design a digital calculator using HTML and Java script.

10. Create and save an XML document at the server, which contains 10 users information. Write a program which takes User Id as input and returns the user details by taking the user information from the XML document.

PROGRAMMING IN JAVA (4+0+3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAC3502	PROGRAMMING IN JAVA	NIL	THEORY + PRACTICE	6	4-0-3

MODULE I (15 HRS)
Introduction: Basic Concept of Object Oriented Programming: Object & Class, Data Abstraction & Encapsulation, Inheritance, Polymorphism, Dynamic Binding and Message Communication.
Evaluation of JAVA: features of JAVA. Java & Internet, Java Environment: JDK, JRE, JAVA Programming
 Structure, Implementing a JAVA Program. JVM, Constant Variable and Data type, Command Line Argument.
Type Casting, Operator and Expression, Operator Precedence & Associatively. Decision making and Branching, Looping (While, do while, for).

MODULE II (15 HRS)
Classes and Object: Defining a class, Creating Object, Constructor, Method Overloading, Static
Members, Inheritance, Method Overriding, Final Variable, final methods and Final Class, Garbage Collection
 & finalize () method, Abstract Method and Class, Visibility Control. Array, String, Vectors, Wrapper classes.
 Interfaces: Defining Interfaces, Extending Interfaces, Implementing Interfaces, Packages: Creating & Accessing Packages

MODULE III (20 HRS)
Exception Handling (try, catch, throw, throws, finally), Multithreading: Creating Threads, Thread Life Cycle,
 Thread Priorities, Synchronization, Inter Thread Communication, Applet Programming: Applet Life Cycle,
Write & Running Applet Program. Managing Input and Output file: Stream classes, Byte Stream Classes & Character Stream Classes, Reading & Writing Files.

Text Book:
1. Programming with JAVA by E. Balagurusamy Tata McGraw - Hill Education
2. Core Java for Beginers, Rashmi Kanta Das, 3rd Edition Vikas Publishing House Pvt Ltd.

Reference Book:
1. Java complete Reference, Herbert Schildt
2. Big Java: Horstman, Willey India, 2nd Edition.
3. Java How to Program: H.M. Deitel & Paul J. Deitel, PHI, 8th Edition

PROGRAMMING IN JAVA LAB

1. Program using Command Line Argument
2. Programming with looping & Control structure
3. Programming with class and Object
4. Programming with Inheritance
5. Programming with Package
6. Programming with Intefaces
7. Programming with Exception Handling
8. Programming with Thread
9. Programming with Applet concept
10. Programming with the concept of File

Discipline Specific Elective Courses (04 papers) (Credit: 06 each)- DSE 1 to DSE 4

1. Programming using python
2. Cryptography and Network Security
3. Cyber Crime and Law
4. Principles of MIS
5. Data Mining and Ware Housing
6. Enterprise Resource Planning
7. Dissertation/ Project

Note: Colleges may include more options as per availability

PROGRAMMING USING PYTHON (4+0+3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAD3001	PROGRAMMING USING PYTHON	NIL	THEORY + PRACTICE	6	4-0-3

MODULE-I (15 Hours)
Overview: Environment, Basic Syntax, Variable Types, Basic Operators, Installing Python. Very Simple Programs

MODULE-II (15 Hours)
Scripts Loops, Conditionals Functions. Tuples, Lists, Dictionaries for Loop, Classes Importing Modules, File I/O Error Handling.

MODULE-III (20 Hours)
Loop , Loop Control. Numbers, Strings, Lists, Tuples, Dictionary, Date & Time. Functions, Modules, Files I/O, Exceptions. Classes / Objects, Reg Expressions, GUI Programming.

Text Books:

1. Programming Python: Powerful Object Oriented Programming; Mark Lutz; Shroff/O'Reilly;2010.
2. Beginning Python: Using Python 2.6 & Python 3.1; James Payne; Wiley India; 2011.
3. Head First Programming: A Learner's Guide to Programming using Python Language; Barry & Griffiths; Shroff/O'Reilly; 2009.

CRYPTOGRAPHY AND NETWORK SECURITY (5+1+0)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAD3002	CRYPTOGRAPHY AND NETWORK SECURITY	NIL	THEORY	6	5-1-0

MODULE-I (20 Hours)
Security and Cryptographic algorithm: Need for security, principle of security, types of attacks. Cryptographic techniques : cryptography terminology, substitution techniques, transposition techniques, Symmetric and asymmetric key algorithm, possible types of attack, key range, steganography. symmetric vs asymmetric, algorithm types and modes, DES, double and triple DES, AES, comparison of various cryptographic algorithm, requirement of good cryptographic algorithm.

MODULE-II (20 Hours)
Asymmetric cryptographic algorithm and Message Authentication: Public key cryptography principles and algorithms, RSA algorithm, Diffe-Hellman key exchange. One way hash functions, message digest, MD5,

SHA1, message authentication code, Digital envelope, Digital signatures.
MODULE-III (10 Hours)
Network security: Overview of IPV4: OSI model, maximum transfer unit, IP, TCP, UDP, ICMP, ARP, RARP and DNS, ping, traceroute. Network attacks: Buffer overflow, IP scheduling, TCP session hijacking, sequence guessing. Network scanning: ICMP, TCP sweeps, basic port scans. Denial of service attacks: SYN flood, teardrop attacks, land, smurf attacks.

TEXT BOOK:
1.   William Stallings: Network Security Essentials
REFERENCE BOOK:
1.   Crytography and Network Security by forouzan

CYBER CRIME AND LAW (5+1+0)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAD3003	CYBER CRIME AND LAW	NIL	THEORY	6	5-1-0

MODULE-I (15 HRS)

Cyber crime: Definition – History and evolution Types and forms of cyber crimes -Malicious Code - Computer Viruses ,Computer Worms ,Computer Trojans, Web Hacking Foot printing, Port Scanning, E-Shoplifting Web Defacement, Denial of Service Attacks, Manipulating Cookies - Email Hacking: Email Hacking using Packet Sniffers, Email Hacking & Phishing, Email Frauds & Phishing, Email Bombing Email Hijacking - Social Engineering .

MODULE- II (15 HRS)

Best Practices for Cyber Crime Investigation: Initialising a Search and Seizure Operation Tracking & Tracing Emails, Recovery of Digital Evidence, Setting up a Cyber Crime Investigation Cell Cyber Forensics: Basic Forensic Principles, Forensic Imaging & Verification, Data Recovery and Analysis

MODULE- III (20 HRS)
Cyber terrorism Prevention and detection of cyber crime – Cyber
Policing Current statutes in India: Penalties & Offences under the Information Technology Act, 2000, Offences under the Indian Penal Code, 1860, Issues relating to investigation and adjudication of cyber crimes in India Digital evidence IT act 2000 and other legal provisions
Intellectual Property Issues and Cyberspace – The Indian Perspective: Overview of Intellectual Property related Legislation in India, Copyright law & Cyberspace Trademark law & Cyberspace. Digital Delivery of Intellectual Property Services

TextBook:

1. Text book on Cyber law by Pavan Duggal, Universal Law publishing

References:

1. Understanding Laws- Cyber laws and cyber crimes by GarimaTiwari
2. Cyber Laws &Cyber crimes by DivyaRohatgi, Law Arati Book
3. Information security and Cyber laws by Pankaj Sharma, S.K.Kataria& Sons

PRINCIPLES OF MIS (5+1+0)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAD3004	PRINCIPLES OF MIS	NIL	THEORY	6	5-1-0

MODULE-I (15 HRS)
Fundamentals of Information Systems, Systems approach to problem solving, Developing information
system solutions, Levels of MIS (Top, Middle, Lower). Corporate Databases & Database Management,
Data Organization, Data models, Data Security & Information quality.

MODULE- II (15 HRS)
Transaction Processing Systems, Executive Information Systems, Decision Support Systems, Expert Systems,
Information Systems in Marketing, Manufacturing, HRM, Accounting and Finance.

MODULE- III (20 HRS)
Information Resource Management, Planning Implementing & Controlling Information Systems, Computer Crime,
Ethics & Society.

TextBook:
1. Brein James O. – Management Information Systems
References:
1. Murdick & Ross – Information Systems for Modern Management
2. Parker C.S. – Management Information Systems – Strategy and Action.
3. Aktas A.Ziya – Structured Analysis and Design of Information Systems.

INTRODUCTION TO DATA MINING AND WARE HOUSING (5+1+0)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAD3005	DATA MINING AND WARE HOUSING	RDBMS	THEORY	6	5-1-0

MODULE I (15 HRS)

Data Warehousing : Data warehousing Components, Building a Data warehouse, Mapping the Data Warehouse
to a Multiprocessor Architecture, DBMS Schemas for Decision Support, Data Extraction, Cleanup, and
Transformation Tools, Metadata.
Business Analysis: Reporting and Query tools and Applications, Tool Categories, The Need for Applications,Online
Analytical Processing (OLAP), Need, Multidimensional Data Model, OLAP Guidelines, Multidimensional versus
Multirelational OLAP, Categories of Tools, OLAP Tools and the Internet.

MODULE II (20 HRS)

Data Mining: Introduction, Data, Types of Data, Data Mining Functionalities, Interestingness of Patterns,
Classification of Data Mining Systems, Data Mining Task Primitives, Integration of a Data Mining System

with a Data Warehouse, Issues, Data Preprocessing.
Mining Frequent Patterns, Associations and Correlations, Mining Methods, Mining various Kinds of
Association Rules, Correlation Analysis, Constraint Based Association Mining, Classification and Prediction,
Basic Concepts, Decision Tree Induction, Bayesian Classification, Rule Based Classification, Classification by
 Back propagation, Support Vector Machines, Associative Classification, Lazy Learners, Other Classification
Methods, Prediction.

MODULE III (15 HRS)

Cluster Analysis , Types of Data, Categorization of Major Clustering Methods, K-means, Partitioning Methods,
Hierarchical Methods, Density Based Methods, Grid Based Methods, Model-Based Clustering Methods,Clustering
 High Dimensional Data, Constraint – Based Cluster, Data Mining Applications.

TextBook:
1. Data Mining and Warehousing by S. Prabhu
Reference:
1. Data Mining and Data Warehousing by Gunjan Goswami.

ENTERPRISE RESOURCE PLANNING (5+1+0)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAD3006	ENTERPRISE RESOURCE PLANNING	NIL	THEORY	6	5-1-0

MODULE I (15 HRS)

Overview of business function: Business function in an organization, material management , scheduling ,
shop floor control, forecasting, accounting and finance, human resources, productivity management,
typical business processes, core processes, product control, sales order processing, purchases, administrative
 process, support processes, marketing strategic planning.

MODULE II (20 HRS)

Problems in traditional functional view, need for integrated process views, information as a resource,
motivation for erp. Evolution of information systems: EDP Systems, MIS, Executive information systems,
Information needs of organization, ERP as an integrator of information needs at various levels, Decision
making at the above level.

MODULE III (15 HRS)

ERP Models/Functionality: Sales order purchasing, MRP scheduling, forecasting, maintenance, distribution,
 finance features of each of the model, description of data flows across each module, overview of supporting
 databases, technologies required for ERP.
TextBook:
1. V.K. Garg and N.K. Venkitakrishnan Enterprice Resource Planning Practices Prentice Hall
Recommended Books:

1. J. Kanter, Managing with information Prentice Hall(I) 1996 New Delhi
2. S Sadagopan Management Information System Prentice Hall(I) 1996 New Delhi
3. V.Rajaraman, Analysis and Design of information system Prentice Hal(I) 11997
4. K.M. Hussain and D. Hussain, Information System: Analysis Design and Implemetation,
   Tata McGraw Hill 1995 New Delhi

DISSERTATION/ PROJECT

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAD3007	DISSERTATION/ PROJECT	ANY PROGRAMMING LANGUAGE	PRACTICE	6	0-0-9

INTRODUCTION TO SOFTWARE ENGINEERING (5+1+0)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAC3601	INTRODUCTION TO SOFTWARE ENGINEERING	NIL	THEORY	6	5-1-0

MODULE –I

Process Models: Software Processes, Software Development Life Cycle Models, Waterfall Model, 'V' Model, Prototyping Model, the Iterative Waterfall Model, the Spiral Model.
Software Requirement Engineering: Requirement Engineering Process, Requirement Inception, Identification of Stakeholders, Requirement, And Requirement Elaboration: User Requirements.

MODULE –II

Structured Analysis & Design: Introduction to Structured Analysis, Data Flow Diagram, Process Specification, Entity Relationship Model, Structured Design Methodologies: Coupling and Cohesion, Software Testing: Testing Fundamentals, Verification & Validation, Black Box Testing, White Box Testing, Unit Testing, Integration Testing, Object Oriented Testing, System Testing, Usability Testing

MODULE –III

Software Metrics- Software Metrics and its Classification, Software Size Metrics: LOC Metrics, Function Point Metrics, Feature Point Metrics, Process Metrics, Design Metrics: High Level Design Metrics, Component Level Design Metrics Object Oriented Metrics: CK Metrics Suite, Metrics for Object Oriented Design (MOOD)
Project Estimation Techniques, COCOMO Model: Basic COCOMO Model, Intermediate COCOMO model, Complete COCOMO model

Textbooks

1. Software Engineering, Roger S Pressman, TMH
2. Fundamentals of Software Engineering, Rajib Mall, PHI
Reference Books

1. Software Engineering, Sommerville, Pearson
2. Software Engineering Fundamentals, Behforooz& Hudson, Oxford

DOT NET TECHNOLOGY (4+0+3)

CODE	SUBJECT NAME	PREREQUISITE	COURSE TYPE	CREDIT	L-T-P
BCAC3602	DOT NET TECHNOLOGY	NIL	THEORY + PRACTICE	6	4-0-3

MODULE-I (15 HRS)

Introduction Vision and goals of .NET, Building blocks of .Net, overview of .Net applications, .Net evolution, The .Net Framework Architecture, Intermediate Language(IL), Common Language Runtime (CLR), JIT Compilation, Common Type System (CTS), Common Language System (CLS), Assemblies, IL Disassembler (ILdasm.exe), Namespaces. **C# features** Working with methods- understanding method structure, calling a method, understanding parameter types, overloading methods, virtual methods, overriding methods.

MODULE- II (15 HRS)

C# classes Constants, fields, methods, properties, events, indexers, operators, constructors, destructors, and static modifiers.
Class Inheritance Compiling with multiple classes, virtual and override methods, abstract methods, sealed classes, Boxing and Unboxing, Working with namespaces, Understanding interfaces, handling exceptions.
Windows Applications Understanding Windows Forms Architecture, Windows controls: Common, Containers, Menus and Tool strips, Data, Reporting. Adding and using windows controls to the form.

MODULE- III (20 HRS)

Database programming with ADO.NET Understanding the Dataset classes and their relatives, Understanding OLEDB and SQL Server Support, Understanding common database operations using ADO.NET – Operations that don't return rows, Data operations that return single, row entities, data operations that affect single-row entities, data operations returning sets of rows, data operations affecting sets of rows, operations that return hierarchical Creating web applications with web forms [Asp.NET]Difference between ASP and ASP.Net, Defining a web application, ASP.NET architecture, ASP.net web forms, Code behind model, Validation controls in ASP.NET, Server controls and data binding, Grid view, data repeater, data list, Data binding in ASP.NET, Data source controls- sql data source, Data controls – grid view and details view, Login controls.

Text Book:
1.Jeff Ferguson, Brian Patterson, Jason Beres, *C# Programming Bible,* Wiley Publishing Inc., Reprint 2006.
Reference Books:
1. Jeff Prosise, *Programming .Net,* 2nd Edition, WP Publishers & Distributors Pvt. Ltd, 2009.

2. Kevin Hoffman & Jeff Gabriel, *Professional .Net Framework*, 1st Edition, Wrox Press Publishers, 2006.

PRACTICAL

1. To implement output parameter and reference parameter
2. To implement the concept of indexers
3. To implement the concept of sealed class
4. To implement the concept of namespace
5. To implement the concept of interfaces
6. To implement the concept of events
7. To implement exception handling
8. To design a calculator in windows form
9. To implement data controls in windows form
10. To implement validation controls in web form
11. To implement Data controls in web form
12. To implement SqlDataReader in ADO.NET
13. To implement Dataset object in ADO.NET