CBCS Format Structured Curriculum

Bachelor of Computer Application (BCA)

Raiganj University,

West Bengal, India

Detailed Syllabus

Bachelor of Computer Application (BCA)

2017-18

CBCS Format

Raiganj University, Raiganj,

Uttar Dinajpur, West Bengal, India

www.raiganjuniversity.ac.in

Program Highlights at a Glance

Overview of the BCA Program:

The BCA is designed specifically for those graduates that need to learn more about the utilization of computing, information science and technology in society, business environments. The target groups in this respect are those who are interested to become IT Professionals, Information Professionals, Systems and Network Engineers and senior and management positions.

Interdisciplinary and Skill based facets of BCA Program:

The BCA is not only combines with Computer science and information sciences but also several interdisciplinary areas such as behavioral sciences, engineering, environmental sciences, law, life sciences, health sciences, management, philosophy, physical sciences, policy, mathematics, social sciences etc for its applied output.

Program Aim:

- Learn and gain an integrated set of IT and Interdisciplinary skills.
- Gain the latest IT skills in Data Management and Cloud Computing etc for easy industrial input.
- Gain the theoretical and practical knowledge required to design Computer applications for various settings and environment.
- Embrace future developments in the field and retain professional relevance.
- Build a strong foundation of Computer system and Informatics.

Program Nature and Distribution:

Number of Semester: 6 (Six)
Number of Teaching/Academic Days: 90 in a Semester
Course Combination: Core, SEC, GE, Ability Enhancement Credit: 142
Nature: Taught-classroom Based, Assignment and Continuous Short Project Enriched, Seminar included, with Grand Project/Dissertation.

SEMESTER –I

Course Code	Course Title	Course Type	(L-T-P)	Credit
BCAC-101	Introduction to Computers & IT	Core	4-0-4	6
BCAC-102	Introduction to Programming Language using C	Core	4-0-4	6
BCAGE-101-I or BCAGE-101-II	Fundamentals of Mathematics or Digital Electronics	Generic Elective	5-1-0	6
ACCE-101	Environmental Studies	AECC (Elective)-I	4-0-0	4
Semester Total Credit				**22**

SEMESTER –II

Course Code	Course Title	Course Type	(L-T-P)	Credit
BCAC-201	Data Structure Using C	Core	4-0-4	6
BCAC-202	Database Management System	Core	4-0-4	6
BCAGE-201-I Or	Advanced Mathematics Or Principles of	Generic Elective	5-1-0	6

BCAGE-201-II	Management			
ACCE-201	English	AECC (Elective)-II	4-0-0	2
Semester Total Credit				**20**

SEMESTER –III

Course Code	Course Title	Course Type	(L-T-P)	Credit
BCAC-301	Computer Architecture	Core	5-1-0	6
BCAC-302	Front End Design Tool VB.Net	Core	4-0-4	6
BCAC-303	Object Oriented Programming using C++	Core	4-0-4	6
BCAGE-301-I Or BCAGE-301-II	Optimization Technique Or E- Commerce	Generic Elective	5-1-0	6
BCASEC-301-I Or BCASEC-301-II	Artificial Intelligence Or Personality Development & Motivation	SEC	1-1-0	2
Semester Total Credit				**26**

SEMESTER –IV

Course Code	Course Title	Course Type	(L-T-P)	Credit
BCAC-401	Web Technologies	Core	4-0-4	6
BCAC-402	Java Programming	Core	4-0-4	6
BCAC-403	Software Engineering	Core	5-1-0	6
BCAGE-401-I Or BCAGE-401-II	Data Ware Housing & Data Mining Or Mobile Computing	Generic Elective	5-1-0	6
BCASEC-401-I Or BCASEC-401-II	Cyber Security & Laws Or SEO	SEC	1-1-0	2
Semester Total Credit				**26**

SEMESTER –V

Course Code	Course Title	Course Type	(L-T-P)	Credit
BCAC-501	Computer Networks	Core	5-1-0	6
BCAC-502	Operating System	Core	5-1-0	6
BCADSE-501-I Or BCADSE-501-II	Information Systems & Management Or Multimedia and its Application	DSE	5-1-0	6
BCADSE-502-I Or BCADSE-502-II	IT Project Management Or Advance Network Technologies	DSE	5-1-0	6
Semester Total Credit				**24**

SEMESTER –VI

Course Code	Course Title	Course Type	(L-T-P)	Credit
BCA**C-6**01	Web Programming(PHP)	Core	4-0-4	6
BCA**C-6**02	System Analysis and Designing	Core	5-1-0	6

BCADSE-601-I Or BCADSE-II	E-Learning Technologies Or Emerging Trends in IT & Computing	DSE	5-1-0	6
BCADSEPRO	Project/ Dissertation	DSE	12	6
Semester Total Credit				**24**

SC = Subject Code, C= Core Course, AECC= Ability Enhancement Compulsory Course, SEC= Skill Enhancement Course, GE= Generic Elective, DSE= Discipline Specific

Semester I

Core Courses:

Introduction to Computers & IT

(6 Credit)

Code: BCAC-101

Theory Portion (4 Credit)

UNIT – I

Introduction to Computers:

The evolution of computers: Computer Generation from First Generation to Fifth Generation. Classifications of Computers: Micro, Mini, Mainframe and super computers, Distributed Computer System, Parallel Computers.

Computer Hardware: Major Components of a digital computer, Block Diagram of a computer Input-output devices, Description of Computer Input Units, Output Units. CPU.

Computer Memory: Memory Cell, Memory Organization, Read Only Memory, Serial Access Memory, Physical Devices Used to construct Memories, Magnetic Hard disk, floppy Disk Drives, Compact Disk Read Only Memory, Magnetic Tape Drives. [T1][R1]

UNIT – II

Interaction With Computers:

Computer Software: System software, assemblers, compilers, interpreters, linkers Elementary Operating System concepts, different types of operating systems, Application Software: Introduction to MS Office (MS-Word, MS Powerpoint, MS-Excel) Computer Programming and Languages: Algorithms, flow chart, decision tables, pseudo code, Low level languages and introduction to high level languages. [T1][T2][R3]

UNIT – III

Computer Number System: Decimal, Binary, Octal, Hexa-decimal.**Conversion:** Decimal to all other number systems, Binary to octal and hexa decimal, Addition of binary numbers, Binary subtraction, Use of complements to represent negative numbers, Conversion of a binary fraction to a decimal fraction and decimal to binary fraction, Binary Coded Decimal(BCD), ASCII Codes, EBCDIC codes, Gray codes, Unicodes.[T1][R1]

UNIT – IV

Computer Network & Internet

Basic elements of a communication system, Data transmission modes, Data Transmission speed, Data transmission media, Digital and Analog Transmission, Network topologies, Network Types (LAN, WAN and MAN), Client and Servers , Intranet, Extranet.

Internet: Terminologies related to Internet: Protocol, Domain name, IP address, URL, World Wide Web.

Overview of various services on Internet: E-mail, FTP, Telnet, Chat , Instant Messaging.

TEXT BOOKS

[T1] P. K. Sinha & Priti Sinha , "Computer Fundamentals", BPB Publications, 1992.

[T2] Anita Goel "Computer Fundamentals", Pearson.

REFERENCE BOOKS

[R1] B.Ram Computer fundamentals Architecture and Organization,New Age Intl.

[R2] Alex Leon & Mathews Leon, "Introduction to Computers", Vikas Publishing .

[R3] Norton Peter, "Introduction to computers", 4th Ed., TMH, 2001.

[R4] Vikas Gupta, "Comdex Computer Kit", Wiley Dreamtech, Delhi, 2004.

Practical Portion (2 Credit)

1. Introduction MS Windows
2. Desktop, creation of folders and shortcuts, features of Windows explorer
3. Familiarisation and using MS packages – Word and basic skills in using these tools.(Version MS-Office'2000)
4. Familiarisation and using MS packages – Excel and basic skills in using these tools.(Version MS-Office'2000)
5. Familiarisation and using MS packages –PowerPoint and basic skills in using these tools.(Version MS-Office'2000)

Some Details experiments are as follows—

1. To open a new open office document and perform the following operations in it. i. Text Alignment ii. Change line spacing to 1.5 iii. Place a box to the entire text iv. Add the bullets and numbering v. Change type of font types and sizes vi. Insert the symbols

2. To prepare an advertisement to a company with the following specifications i. Attractive Page Border. ii. Design the name of company using WordArt. iii. Use ClipArt Using of OpenOffice writer.
3. To design a Visiting Card for a company following specification i. Size of the Visiting Card 4" X 3". ii. Name of the company with a WortArt. iii. Using of OpenOffice writer.
4. To perform Table Creation, Formatting and Conversion using OpenOffice.org.
5. To perform mail merge and letter preparation using OpenOffice.org.
6. To draw a flow chart for a given problem in the OpenOffice.org.
7. To perform the formula editor in OpenOffice.org Calc .
8. To perform the insertion of objects, graphics and protecting the document in OpenOffice.org Calc
9. To Draw a line, XY, bar and pie chart for a given user data in OpenOffice.org Calc To perform the sorting and import/export features in OpenOffice.org Calc.
10. Creating An Impress Presentation using wizard
11. Create a presentation on Tourism of a place using different template, color schema and text formats
12. Create a presentation about your college and department using animations and sound effects.Add OLE object to your presentation.

Books:

1.Introduction to Computers with MS-Office, Leon, TMH

2.Personal Computer Software, EXCEL BOOKS

3.A First Course in Computers 2003, Saxena, VIKAS

4.Computer Concepts & Windows,Stoline,SPD/LABYRINTH

5.Windows'98 in easy steps,Harshad Kotecha, Wiley Dreamtech

6.Office 2000 in easy steps, Stephen Copestake, Wiley Dreamtech

7.Windows & MS-Office 2000, Krishnan, SCITECH

8.Trouble Shooting Microsoft Windows,PHI/MSP

Introduction to Programming Language using C
(6 Credit)
Code: BCAC-102
Theory Portion (4 Credit)

UNIT I

C basics: C character set, Identifiers and keywords, Data types, constants, variables and arrays, declarations, expressions statements, symbolic constants, compound statements, arithmetic operators, unary operators, relational and logical operators, assignment operators, conditional operators, bit operators.

C constructs: If statement, if….else statement, if…..else if….else statement, while statement, do….while statement, for statement, switch statement, nested control statement, break operator, continue operator, comma operator, goto statement. .[T1,T2,T3]

UNIT – II

C Functions: Functions: declaration, definition & scope, recursion, call by value, call by reference.

Storage Classes: automatic, external (global), static & registers.

Arrays: Arrays, pointers, array & pointer relationship, pointer arithmetic, dynamic memory allocation, pointer to arrays, array of pointers, pointers to functions, array of pointers to functions, Preprocessor directives: #include, #define, macro's with arguments, the operators # and ##, conditional compilations. [T1,T2,T3]

UNIT – III

Structures: Structures, unions, passing structure to functions, bit fields, file handling [text (ASCII), binary] [T1,T2,T3]

UNIT – IV

String manipulation functions and other standard library functions from stdio.h, stdlib.h, conio.h, ctype.h, math.h, string.h, process.h. Usage of command line arguments. [T1, T2, T3]

TEXTBOOKS:

[T1]Ashok N. Kamthane, "Computer Basics and C Programming", Pearson Education.

[T2]E. BalaGuruswamy, "Programming in ANSI C", 2008.

[T3]V Rajaraman, “Computer Basics and C Programming”, PHI.

REFERENCES:

[R1]Herbert Schildt, “C The Complete Reference” Fourth Edition, 2000.
[R2]Yashwant Kanetkar, “Let us C” eighth edition, 2002.

[R3]Kernighan and d. Ritchie, “The ANSI C Programming Language”, 2000.

[R4]Stephenn Prata**, “**C Primer Plus” Fourth Edition, 2001.

[R5]Schaum’s Outline Series, “Programming with C”, 2nd Edition, 1996.

Practical Portion (2 Credit)

1. Program to check whether a number is positive or negative or zero using if statement.
2. Program to check vowel or consonant using switch case statement.
3. Program to check whether a number is prime or not using while statement.
4. Program to generate multiplication table using do…while statement.
5. Program to check the given string is palindrome or not using for statement.
6. Program to display Fibonacci series.
7. Program to search an element in an array using linear search method.
8. Program to find the smallest and largest number among ‘n’ numbers.
9. Program to sort elements in an array.
10. Program to add two matrices.
11. Program for manipulating the strings using string handling functions.
12. Program to find the sum of ‘n’ numbers by making function.
13. Program to calculate factorial of a number using recursion.
14. Program to generate the mark sheet of the student using structure.
15. Program to copy the content of one file to other file.

Generic Elective Courses (Any 1)

Paper Name: Fundamentals of Mathematics (6 Credit)
Code: BCAGE-101 (A)

UNIT - I

DETERMINANTS: Definition, Minors, Cofactors, Properties of Determinants, MATRICES: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Adjoint, Inverse, Cramers Rule, Rank of Matrix Dependence of Vectors, Eigen - Vectors of a Matrix, Caley-Hamilton Theorem (without proof)

UNIT – II

LIMITS & CONTINUITY: Limit at a 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.

UNIT-III

DIFFERENTIATION: Derivative, Derivatives of Sum, Differences, Product & quotients, Chain Rule, Derivatives of Composite Functions, Logarithmic Differentiation, Rolle's Theorem, Mean Value Theorem, Expansion of Functions (Maclaurin's & Taylor's), Indeterminate Forms, L' Hospitals Rule, Maxima & Minima, Asymptote, Successive Differentiation & Liebnitz Theorem.

UNIT – IV

INTEGRATION: Integral as Limit of Sum, Riemann Sum, Fundamental Theorem of Calculus, Indefinite Integrals, Methods of Integration Substitution, By Parts, Partial Fractions, Integration of Algebraic and transcedental Functions, Reduction Formulae for Trigonometric Functions, Gamma and Beta Functions.

TEXT BOOKS:

[T1] Kresyig E., "Advanced Engineering Mathematics", 5th Edition, John Wiley & Sons,1999.

[T2] Babu Ram, "Engineering Mathematics", Pearson Education.

[T3] Apostol Tom M, Calculus, Vol I and II John Wiley (2003).

REFERENCE BOOKS:

[R1] B.S. Grewal, "Elementary Engineering Mathematics", 34th Ed., 1998.

[R2] H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Company, 9th Revised Edition, 2001.

[R3] Shanti Narayan, "Differential Calculas", S.Chand & Company, 1998

Paper Name: Digital Electronics (6 Credit)
Code: BCAGE-101 (B)

UNIT-I

Logic gates NOT, AND, OR, Universal gates- NAND, NOR. EX-OR and EX-NOR gates. Diode and Transistor as a switch Logic Families-RTL, DTL, TTL, ECL, CMOS – (Main features only - without details of circuit connections and working). Definition of- current and voltage parameters, noise margin, Fan-in, Fan-out

Boolean Algebra: Basics Laws of Boolean Algebra, Logic Gates, Simplifications of Boolean equations using K-maps.[T1,T2,T3]

UNIT-II

Review of various number systems (Binary, Octal, Hexadecimal), Definition of BCD , Gray codes and Excess – 3 codes and their application (without design of code convertors) Parity generation and Checking.

Arithmetic Circuits

Adder, Subtractor, Parallel binary adder/Subtractor, binary multiplier and dibvider. Combinational CircuitsMultiplexers, De-Multiplexers, decoders, encoders,.[T1,T2,R3]

UNIT-III

Flip-flops, S-R, D, J-K, T, Clocked Flip-flop, Race around condition, Master slave Flip-Flop, Realisation of one flip-flop using other flip-flop, Shift Registers

Serial-in-serial-out, serial-in-parallel-out, parallel-in-serial-out and parallel-in-parallel-out, Bi-directional shift register. [T1,T2,R3]

UNIT-IV

Counters: Ripple counter, Synchronous Counter, Modulo Counters, Ring Counter, Twisted Ring Counter. Memory Devices - RAM, ROM, PAL & PLA [T1,T2,T3,R3]

TEXT BOOKS

[T1]. Moris Mano, “Digital Logic and Computer Design”, PHI Publications, 2002.

[T2]. Raj Kamal, “Digital Systems “ , Principles and Design, Pearson ,2011.

[T3]. R. P. Jain, “Modern Digital Electronics”, TMH, 3rd Edition, 2003.

REFERENCES:

[R1]. R.L.Tokheim, “Digital Electronics, Principles and Applications”, Tata McGraw Hill,

1999.

[R2]. W.Gothman, “Digital electronics”, PHI.

[R3]. S. Salivahanan & S. Arivyhgan. “Digital circuits and design”, Vikas Publication,

2001.

[R4]. Malvino Leach, "Digital Principles and Application", TMH, 1999.

Ability Enhancement Courses

Course Title: Environmental Studies
COURSE CODE: AECE101
Credit: 04

Unit 1: Introduction to Environmental Studies

- Multidisciplinary nature of environmental studies
- Definition, Nature, Scope andImportance of environmental studies
- Types and Components ofenvironment
- Sustainable development

Unit 2: Ecosystems

- ConceptofEcology and Ecosystem,StructureandFunctionofanEcosystem
- Different types of ecosystem; Forest, Desert and Aquatic (Ponds and Oceans)Biomes
- Energy flow in the ecosystem, energy flowmodels
- Food chains, food weds and ecologicalpyramids
- Ecological Succession

Unit 3: Natural Resources: Renewable and Non- renewable Resources

- Land resources: Land degradation, Landslides, Soilerosion
- Forest resources: Uses, types and importance, deforestation and itseffects, Forest biodiversity and tribal population
- Water resources: Distribution of water on Earth; Use and over-exploitation of surface and ground water ; conflicts over water (international & inter-state)
- Energyresources:RenewableandNonrenewableenergysources;Useofalternativeenergy Sources

Unit 4: Biodiversity and conservation

- Introduction – Definition: Levels of biological diversity: Genetics, Species and Eco-systemDiversity, Biodiversity hot spots and mega biodiversity countries.
- Threats to biodiversity; Value (services) of biodiversity; man-wildlife conflicts, biological invasions
- Conservation of biodiversity: *In situ* and *Ex situ* conservation ofbiodiversity; Endangered and endemic species of India

Unit 5: Environmental Pollution

- Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution
- Nuclearhazards and human health risks.
- Solid waste management: Control measures of urban and industrial waste.
- Fire works Pollution

Unit 6: Environmental Policies & Practices

- Climate change, global warming, ozone layer depletion, acid rain and its impacts on

human communities and agriculture

- Environment Laws: Environment Protection Act, 1986; Air (Prevention & Control of Pollution) Act, 1981; Water (Prevention and control of Pollution) Act, 1972; Wildlife Protection Act, 1972; ForestConservation Act, 1920, 1988; International agreements: Montreal protocols, 1987 and Kyoto protocols, 1997 and Convention on Biological Diversity (CBD)
- Tribal populations and rights.

Unit 7: Human Communities and the Environment

- Human population growth: Population Explosion, Impacts on environment, human health and welfare.
- Disaster management: floods, earthquake, cyclones and landslides.
- Environmental movements: Chipko, Silent valley
- Environmental ethics: Role of Indian and other religions and cultures in environmentalConservation
- Environment and human health: Concept of health anddiseases (Vector Borne Diseases)
- Human Rights, Value Education, Role of Information Technology inEnvironment

Unit 8: Field Work (Project Work)

- Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.
- Visit to a local polluted site-Urban/Rural/Industrial/Agricultural.
- Study of common plants, insects, birds and basic principles of identification
- Study of simple ecosystems-pond, river etc

Suggested Readings:

1. Carsen, R. 2002. Silent Spring, Houghton Mifflin,Harcourt.
2. Rao,M.N&DattaA.K.1987.WasteWaterTreatment,OxfordandIBHPublishingCo.Pvt. Ltd.
3. Raven, P.H Hassenzahl, D.M. & Berg L.R, 2012 Environment.8thEdition. John Wiley & Sons.
4. Singh, J.S.Singh, S.P. and Gupta, S.R. 2014.Ecology, Environmental Science and Conservation. S. Chand Publishing, NewDelhi.
5. Agarwal, K.C.2001 Environmental Biology, Nidi Publication .Ltd.Bikaner.
6. BharuchaErach, The Biodiversity Biology of India, Mapin Publishing Pvt. Ltd. Ahmedbad,India
7. Cunningham,W.P.Cooper,T.H.Gorhani,E&Hepworth,M.T.2001,Environmental Encyclopedia.JaicoPubl.House.Mumbai.1196p.
8. Heywood,V.h&Watson,R.T. 1995. Global Biodiversity Assessment. Cambridge UniversityPress.
9. Jadhav,H&BhosaleV.M.1995.EnvironmentalProtectionandLaws,HimalayaPublishing House,Delhi

10. Mckinney,M.L. &Schoch.R.M. 1996. Environmental Science systems & Solutions, Web enhancededition.
11. Saha T.K. 2010. Ecology and Environmental Biology, Books and Allied (P) Ltd. Kolkata.
12. Santra S.C. 2005. Environmental Science, New Central Book Agency (P) Ltd. Kolkata.
13. Singh, S. 1991. Environmental Geography, PrayagPustakBhawan, Allahabad.
14. Roy, S. 2003.Environmental Science, Publishing Syndicate, Kolkata
15. Sharma, P. D. 2012. Ecology and Environment, Rastogi Publication
16. Dash, M. C. 2001. Fundamentals of Ecology, Tata McGraw-Hill Publishing Company Ltd
17. Arora, Mohan P. 2009. Ecology, Himalaya Publishing House
18. Saha T.K. 2010. Ecology and Environmental Biology, Books and Allied (P) Ltd. Kolkata.
19. Santra S.C. 2005. Environmental Science, New Central Book Agency (P) Ltd. Kolkata.
20. Environmental Studies—Prof S.V.S Rana.--Rastogi Publication.
21. Text book of Ecology: The Experimental Analysis of distribution & abundance--(Charles J. Krebs).Pearson Education.
22. ErachBharucha, 2016. Text Book of Environmental Studies for Undergraduate Courses (Second Edition) for UGC. University Press.

Semester II

Core Courses:

Paper Title: Data Structures Using C

Course Code: BCAC-201

Credit: 6

Theory Portion 4 Credit

UNIT-I

Introduction to Data Structures: Basic Terminology, Elementary Data Organizations, Classification of data structures and its operations.

Arrays: Representation of single and multidimensional arrays (up to three dimensions) ; sparse arrays - lower and upper triangular matrices and Tri-diagonal matrices; addition and subtraction of two sparse arrays. (Multidimensional, and, sparse arrays, to be given elementary treatment.)

Stacks and Queues: Introduction and primitive operations on stack; Stack application: Polish Notations; Evaluation of postfix expression; Conversion from infix to postfix; Introduction and primitive operations on queues; D-queues and priority queues.[T1,T2,T3]

UNIT-II

Lists: Introduction to linked lists; Sequential and linked lists, operations such as traversal, insertion, deletion, searching, Two way lists and Use of headers

Trees: Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion and deletion; [T1, T2, T3]

UNIT-III

Introduction to and creation of AVL trees and m-way search trees - (elementary treatment to be given); Multilevel indexing and B-Trees: Introduction; Indexing with binary search trees; Multilevel indexing, a better approach to tree indexes; Example for creating a B-tree. [T1, T2, T3]

UNIT-IV

Sorting Techniques: Insertion sort, selection sort and merge sort.

Searching Techniques: linear search, binary search and hashing. (Complexities NOT to be discussed for sorting and searching) [T1, T2, T3]

TEXTBOOKS:

[T1] Ashok N. Kamthane, "Introduction to Data Structures in C", Pearson Edu.

[T2] Y. Langsam, Tananbaum, et. al., "Data Structures using C and C++", PHI, 1999.

[T3] Schaum's outline series, "Data Structure", TMH, 2002

REFERENCES:

[R1] Yashwant Kanetkar, "Data Structures Through C",BPB Publications, 2008

[R2] A.K. Sharma, " Data Structure Using C", Pearson

[R3] P. S. Deshpande and O.G. Kakde, "C & Data Structure", Wiley Dreamtech, 1st Edition, 2003.

[R4] Richard F. Gilberg & Behrouz A. Forouzan, " Data Structures – A Pseudocode Approach with C", second edition, COURSE TECHNOLOGY, CENGAGE Learning

[R5] E. Horowitz and S. Sahani, "Fundamentals of Data Structures", Galgotia Booksource Pvt. Ltd, 2003

Practical Portion 2 Credit

1. Implementation of array operations: Stacks and Queues: adding, deleting elements Circular Queue

2. Adding & deleting elements Merging Problem : Evaluation of expressions operations on Multiple stacks & queues
3. Implementation of linked lists: inserting, deleting, inverting a linked list.
4. Implementation of stacks & queues using linked lists:Polynomial addition,
5. Polynomial multiplication Sparse Matrices :
6. Multiplication, addition. Recursive and Nonrecursive traversal of Trees Threaded binary tree traversal. AVL tree implementation Application of Trees.
7. Application of sorting and searching algorithms Hash tables implementation: searching, inserting and deleting, searching & sorting techniques.

Paper Title: Database Management System
Course Code: BCAC-202
Credit: 6
Theory Portion 4 Credit

UNIT-I

Introduction to Data Structures : Basic Terminology, Elementary Data Organizations, Classification of data structures and its operations.

Arrays: Representation of single and multidimensional arrays (up to three dimensions) ; sparse arrays - lower and upper triangular matrices and Tri-diagonal matrices; addition and subtraction of two sparse arrays. (Multidimensional, and, sparse arrays, to be given elementary treatment.)

Stacks and Queues: Introduction and primitive operations on stack; Stack application: Polish Notations; Evaluation of postfix expression; Conversion from infix to postfix; Introduction and primitive operations on queues; D-queues and priority queues.[T1,T2,T3]

UNIT-II

Lists: Introduction to linked lists; Sequential and linked lists, operations such as traversal, insertion, deletion, searching, Two way lists and Use of headers

Trees: Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion and deletion; [T1, T2, T3]

UNIT-III

Introduction to and creation of AVL trees and m-way search trees - (elementary treatment to be given); Multilevel indexing and B-Trees: Introduction; Indexing with binary search trees; Multilevel indexing, a better approach to tree indexes; Example for creating a B-tree. [T1, T2, T3]

UNIT-IV

Sorting Techniques: Insertion sort, selection sort and merge sort.

Searching Techniques: linear search, binary search and hashing. (Complexities NOT to be discussed for sorting and searching) [T1, T2, T3]

TEXTBOOKS:

[T1] Ashok N. Kamthane, "Introduction to Data Structures in C", Pearson Edu.

[T2] Y. Langsam, Tananbaum, et. al., "Data Structures using C and C++", PHI, 1999.

[T3] Schaum's outline series, "Data Structure", TMH, 2002

REFERENCES:

[R1] Yashwant Kanetkar, "Data Structures Through C",BPB Publications, 2008

[R2] A.K. Sharma, " Data Structure Using C", Pearson

[R3] P. S. Deshpande and O.G. Kakde, "C & Data Structure", Wiley Dreamtech, 1st Edition, 2003.

[R4] Richard F. Gilberg & Behrouz A. Forouzan, " Data Structures – A Pseudocode Approach with C", second edition, COURSE TECHNOLOGY, CENGAGE Learning

[R5] E. Horowitz and S. Sahani, "Fundamentals of Data Structures", Galgotia Booksource Pvt. Ltd, 2003

Practical Portion 2 Credit

1. TABLE CREATION: a) Create table CUST based on the following details Name Type Remark CID VARCHAR2(6) PRIMARY KEY CNAME VARCHAR2(10) CCITY VARCHAR2(8) b) Create table PROD based on the following details Name Type Remark PID VARCHAR2(6) PRIMARY KEY PNAME VARCHAR2(6) PCOST NUMBER(4,2) PPROFIT NUMBER(3) c) Create table SALE_DETAIL based on the following details

Name Type Remark CID VARCHAR2(6) COMPOSITE PRIMARY KEY PID VARCHAR2(6) COMPOSITE PRIMARY KEY SALE NUMBER(3) SALEDT DATE 1. INSERTION AND DATA RETRIEVAL: a) Insert and Save Records in CUST, PROD and SALE_DETAIL table. b) Data Retrieval using SELECT-WHERE, RELATIONAL OPERATOR, ARITHMETIC OPERATOR and use of ORDERBY, DISTINCT, BETWEEN, IN, DUAL and LIKE operator.

2. FUNCTIONS: a) Date Functions, Numeric Functions, Character Functions, Conversion Functions. b) Group Functions, Set Functions. 31 FSH (BCA) COMPUTER APPLICATIONS - 2015-2016

3. ALTER, UPDATE, DELETE, SUBQUERY AND JOINS: a) Use of ALTER, UPDATE, DELETE and DROP Commands. b) Using SUBQUERY and JOINS (Equi Join, Non-Equi Join, Outer Join, Self Join) in data retrieval. c) Create Views, Sequences and Constraints related Query. PL/SQL: 1. Make use of COMMIT, ROLLBACK, and SAVEPOINT in a PL/SQL Block. 2. Create a PL/SQL Script to convert temperature in Fahrenheit into Celsius, and vice versa. 3. Calculate the sum of the even integers between 1 and 100.

4. Create a PL/SQL block to find ODD or EVEN NUMBER by using Searched CASE Statements.

5. Calculate a factorial of given number by using FOR loop

6. Program development using BUILT –IN Exceptions, USER defined Exceptions, RAISE- APPLICATION ERROR.

7. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.

8. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.

9. Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.

10. Develop programs using CURSORS-Declaring, Opening, Fetching, and Closing a Cursor, including the use of CURSOR attributes.

Generic Elective Courses (Any One)

Paper Title: Advanced Mathematics
Course Code: BCAGE-201 (A)
Credit: 6

UNIT I

SETS: Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, Simple Applications.

RELATIONS AND FUNCTIONS: Properties of Relations, Equivalence Relation, Partial Order Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions, Hashing functions, Recursive function. [T1][T2]

UNIT – II

PARTIAL ORDER RELATIONS AND LATTICES: Partial Order Sets, Representation of POSETS using Hasse diagram, Chains, Maximal and Minimal Point, Glb, lub, Lattices & Algebric Systems, Principle of Duality, Basic Properties, Sublattices, Distributed & Complemented Lattices. [T1][T2]

UNIT-III

Graphs: types and operations(bipartite graph. Subgraph, distance of a graph, cut-edges & cut vertices, isomorphic and homomorphic graphs), degree of graphs, adjacent and incidence matrices, path circuit(Floyd's and Warshall algorithms), hamiltonian graph, graph colouring. [T1][T2]

UNIT – IV

Propositional Logic: Proposition, First order logic, Basic logical operation, truth tables, tautologies, contradictions, Algebra of Proposition, logical implications, logical equivalence, predicates, Universal and existential quantifiers. [T1[T2]

TEXT BOOKS:

[T1]Rosen, K.H., Discrete Mathematics and its Applications, McGraw Hill, (2006) 6th ed.

[T2]Kolman, Busby and Ross, "Discrete Mathematical Structure", PHI, 1996.

[T3]Babu Ram, "Discrete Mathematics", Pearson Education

REFERENCE BOOKS:

[T1]S.K. Sarkar, "Discrete Maths"; S. Chand & Co., 2000.

[T2]Tremblay, J.P. and Manohar, R., Discrete Mathematical Structures with Applications to Computer Science, Tata McGraw Hill, (2007).

Paper Title: Principle of Management
Course Code: BCAGE-201 (B)
Credit: 6

UNIT – I

Management: Meaning & concept, Management principles (Fayol & Taylor), Management process (in brief), Managerial levels, Roles & skills of a manager, Management Theories (Classical, Neo classical, Behavioral, Systems & Contingency) [Elementary][T1,R1]

UNIT – II :

Planning: Meaning, Purpose & process, Decision making: Concept & process,

Organizing: Process, Departmentation, Authority & Responsibility relationships, Decentralization. Staffing: Nature & Importance, [T1,R1]

UNIT-III

Staffing: Concept, nature & importance of staffing.

Directing: Motivation: concept & theories (Maslow's, Herzberg Two factor, McGregor's theory X & Y) , Leadership: Concepts & styles.

Controlling: Nature, Importance, significance & Process of control.[T1,R1]

UNIT – IV

Managing People - Meaning, Need of understanding human behavior in organization, Models of OB, **Major concepts in OB (elementary)**- Personality, Learning, Perception & Attitude Building. [T1,R2, R3]

TEXT BOOKS

[T1] Dr. C.B Gupta “Management concepts & practices” S.Chand & Sons, 2009.

REFERENCE BOOKS

[R1] Stoner,Freeman & Gilbert, “Management” 6th Edition, Pearson International.

[R2] Ankur Chhabra, “Organisational Behaviour”, Sun India Publications, 2009

[R3] Robbins, Stephen P, “Organisational Behaviour”. PHI, 2010

Ability Enhancement Courses

Paper Title: Communicative English
Course Code: ACCE-201
Credit: 2

Semester III

Core Courses

Paper Title: Computer Architecture
Course Code: BCAC-301
Credit: 6

UNIT-I

Register Transfer and Micro-operations:Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Microoperations, Arithmetic logic shift unit

Basic Computer Organizations and Design: Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory-Reference Instructions, Register reference instructions, Input - Output Instructions, Design of Accumulator Logic **[T1]**

UNIT-II

Design of Microprogrammed Control Unit

Central Processing Unit: Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes. Difference between RISC and CISC .

Pipeline and Vector Processing: Arithmetic and Instruction pipeline, Vector operations, Matrix Multiplication, memory interleaving.**[T1,R2]**

UNIT-III

Computer Arithmetic: Introduction, Multiplication Algorithms, Division Algorithms, for fixed point-members.[T1,R2]

Input-Output Organization: Peripheral Devices, Input-Output Interfaces, Asynchronous

Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA**)[T1]**

UNIT-IV

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware**[T1]**

TEXT BOOKS :

[T1]. Morris Mano, Computer System Architecture, 3rd Edition, Prentice-Hall of India Private Limited, 1999.

REFERENCE BOOKS:

[R1]. WIliam Stallings, Computer Organization and Architecture, 4th Edition, Prentice Hall of India Private Limited, 2001

[R2]. Subrata Ghosal," Computer Architecture and Organization" , Pearson 2011

[R3]. Malvino, "Digital Computer Electronics: An Introduction to Microcomputers", McGraw Hill,

Paper Title: Front End Design Tool VB.Net
Course Code: BCAC-302
Credit: 6
Theory Portion: 4 Credits

UNIT I

Introduction: Introduction to .Net, Two tier and Three tier client server model, .Net Architecture, Features of .Net, Advantages of .Net, .Net Framework, CLR, CTS, CLS, Assemblies, Memory management issues – Garbage Collector and collection process, Exception Handling, Code Access Security. [T1,R2]

UNIT – II

Introduction to Visual Basic.Net IDE: Creating a project, Types of project in .Net, Exploring and coding a project, Solution explorer, toolbox, properties window, Output window, Object Browser. [T1, T2]

VB.Net Programming Language: Similarities and Differences with Visual Basic, Variables, Comments, Data Types, Working with Data Structures – Arrays, Array Lists, Enumerations, Constants, Structures; Introduction to procedures, calling procedures, argument passing mechanisms, scope of variable.

Control Flow Statements – conditional statement, Loops, Nesting of Loops, MsgBox and Input Box. [T1,R2]

UNIT-III

GUI Programming: Introduction to Window Applications, Using Form – Common Controls, Properties, Methods and Events. Interacting with controls - Textbox, Label, Button, Listbox, Combobox, Checkbox, Picture Box, Radio Button, Panel, scroll bar, Timer, ListView, TreeView, toolbar, Status Bar. Dialog Controls, Creating and Using MDI applications, Toolbar, Status Bar, Creating custom controls, Creating Menus. [T1, T2, R1]

Object Oriented Features: Classes and Objects, Access Specifiers: Private, Public and Protected, Building Classes, Reusability, Constructors, Inheritance, Overloading, Overriding, Creating and Using Namespaces. [T2, R1]

UNIT – IV

Introduction to ADO: ADO vs ADO.Net, ADO.Net data namespaces, ADO.Net Object Model, Accessing data from Server Explorer, Creating Connection, Command, Data Adapter, Data Reader and Data Set with OLEDB and SQLDB, Data Binding. [T1, R1, R2]

Crystal Report : Connection to Database, Table, Queries, Building Report, Modifying Report, Formatting Fields, Publishing and exporting reports.. [T2]

TEXT BOOKS

[T1]Visual Basic 2010 programming Black Book, by Kogent Learning Solutions, Wiley India
[T2]Visual Basic 2010 Step By Step, Michael Halvorson, PHI

REFERENCE BOOKS

[R1] Mastering Microsoft Visual Basic 2010, Evangelos Petroutsos, Wiley Publications
[R2] Beginning Visual Basic 2010 (Wrox)

Practical Portion: 2 Credits

1. Develop an Image Viewer Application
2. Simulate a Math Calculator
3. Develop a Notepad Editor using Dialog Control
4. Simulate a Paint Brush Application
5. To Move an object using Timer Control
6. Develop a Simple Student Information System Using Files

7. Develop a College Admission Form Using MDI
8. Validate a Bio – Data Application Form
9. Develop an Inventory Control System Using ADO.NET
10. Develop a mark sheet preparation system Using Grid Control. Other than these, possible lab exercises related to syllabus can also be included.

Paper Title: Object Oriented Programming using C++
Course Code: BCAC-303
Credit: 6
Theory Portion: 4 Credits

UNIT – I

Introduction: Introducing Object-Oriented Approach, Relating to other paradigms (functional, data decomposition). Features of Procedure oriented programming, Basic Concepts of Object Oriented Programming, Benefits of OOP, Applications of OOP, Difference between C and C++, cin, cout, new, delete operators.

C++ Environment: Program development environment, the language and the C++ language standards. C++ standard libraries.
Introduction to various C++ compilers, C++ standard libraries, Testing the C++ program in Turbo C++/Borland C++/MicroSoft VC++/GNU C++ compiler. [T1][T2][T3]

UNIT – II

Classes and Objects: Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, references, this pointer, Function Overloading, Constructors and destructors, instantiation of objects, Default parameter value, C++ garbage collection, dynamic memory allocation, Meta class/abstract classes.[T1][T2]

UNIT – III

Inheritance and Polymorphism: Inheritance, Class hierarchy, derivation – public, private & protected, Aggregation, composition v/s classification hierarchies, Polymorphism, Categorization of polymorphism techniques, Method polymorphism, Polymorphism by parameter, Operator overloading, Parametric polymorphism, Virtual Function, Early v/s Late Binding.[T1][R2] **[No. of Hrs: 10]**

UNIT – IV

Generic Programming – Introduction, templates, template functions, Overloading of template functions, Overriding inheritance methods.

Files and Exception Handling: Persistant objects, Streams and files, Namespaces, The basic stream classes: C++ predefined streams, Error handling during file operations, Command Line Arguments. Types of Exception, Catching and Handling Exceptions.[T1][T3]

TEXT BOOKS

[T1] Ashok N. Kamthane, "Object-Oriented Programming With Ansi And Turbo C++", Pearson Education.

[T2] A.R.Venugopal, Rajkumar, T. Ravishanker "Mastering C++", TMH, 1997.

[T3] E. Balguruswamy, **"C++ "**, TMH Publication ISBN 0-07-462038-x .

REFERENCE BOOKS

[R1] Mahesh Bhave, "Object Oriented Programming with C++", Pearson Education.

[R2] D . Parasons, "Object Oriented Programming with C++", BPB Publication.

[R3]Steven C. Lawlor, "The Art of Programming Computer Science with C++", Vikas Publication.

[R4] Schildt Herbert, "C++: The Complete Reference", 4th Ed., Tata McGraw Hill, 1999.

[R5] R. Lafore, "Object Oriented Programming using C++", Galgotia Publications, 2004.

Practical Portion: 2 Credits

1. Write a C++ program to implement the concept of classes and object
a. Create a class 'staff ', to create different objects and to test the functioning of member functions, constructors and Destructors.
2. write a C++ program to implement the concept Arrays of Objects a. Create Class 'student', create an array of students, find out the student who got the first rank
3. Write a C++ program to implement operator overloading to perform complex arithmetic
4. Write a C++ program to implement the concept of Inheritance a. Create a class 'College', create another class 'department' by using 'college' as a base class, and verify the functions in the derived and base classes. Also to verify by keeping the two functions with same name (one in the base class and another in derived class)
5. Write a C++ program to handle the error using Exception Handling.
6. Write a C++ program to implement stack using array.
7. Write a C++ program to implement Queue using array.
8. Write a C++ program to convert the infix to postfix expression.
9. Write a C++ program for inorder, preorder and post order tree traversals.
10. Write a C++ program for sorting the given set of elements using selection and bubble sort.

Generic Elective Courses (Any One)

Paper Title: Optimization Technique
Course Code: BCAGE-301 (A)
Credit: 6

UNIT – I

Measures of Central Tendency & Dispersion

Definition, Importance & Limitation. Collection of data and formation of frequency distribution. Graphic presentation of frequency distribution – graphics, Bars, Histogram, Diagrammatic. Measures of central tendency – mean, median and mode, partition values – quartiles, deciles and percentiles. Measures of variation – range, IQR, quartile, deciles and percentiles.

UNIT – II

Correlation/Regression

Correlation Coefficient; Assumptions of correlation analysis; coefficients of determination and correlation; measurement of correlation- Karl Person's Methods; Spearman's rank correlation; concurrent deviation the correlation coefficient; Pitfalls and limitations associated with regression and correlation analysis; real world application using IT tools.

UNIT – III

Linear Programming & Queuing

Concept a assumptions usage in business decision making linear programming problem: formulation, methods of solving: graphical and simplex, problems with mixed constraints: duality; concept, significance, usage & application in business decision making.

Queuing Models: Basic structure of queuing models, Birth-Death queuing models and its steady state solution, M/M/1 and M/M/C models with infinite/finite waiting space, PERT,CPM

UNIT – IV

Transportation & Assignment Problem

General structure of transportation problem, solution procedure for transportation problem, methods for finding initial solution, test for optimality. Maximization of transportation problem, transportation problem. Assignment problem approach of the assignment model, solution methods of assignment problem, maximization in an assignment, unbalanced assignment problem, restriction on assignment.

TEXT BOOKS

[T1] Sharma, J.K.; Operations Research: problems & solutions; Macmillan India

[T2] Gupta, S.P. and Gupta, P.K.; Quantitative Techniques and Operations Research,

Sultan Chand & Sons

[T3] Vohra, N.D.; Quantitative Techniques in Management 2003.

[T4] Gupta, S.P. Statistical Methods, Sultan Chand &Sons.2004

[T5] A. M. Natarajan, P Balasubramani A. Tamilarasi, Operations Research, Pearson 2005

REFERENCE BOOKS

[R1] R.L.Rardin, Optimization in Operations Research, Prentice Hall.

[R2] A.Racindran, D.T.Phillips, J.S.Solberg, Second edition, John Wiley.

Paper Title: E-Commerce
Course Code: BCAGE-301 (B)
Credit: 6

UNIT-I

An Overview of E-Commerce: Trade Process & Trade Cycles their linkages with information exchange; Definitions of E-commerce & E-business & their difference; Problems with Manual Systems, Aims of E-commerce, Functions of E-commerce, Applications of E-commerce in business functions, Tools & Technologies for E-commerce,Types of E-commerce,Operational & Strategic benefits of E-commerce, Issues & Challenges in E-commerce .

Electronic Data Interchange (EDI): Definition, Concept & Evolution of EDI, Traditional versus EDI enabled system for document exchange, EDI Layered Architecture, Process of EDI Message Exchange, Components of EDI, UNEDIFACT Standards & Message Structure, EDI in India, EDI enabled procurement process, EDI Implementation, UN '**Model Interchange Agreement**' for international commercial use of EDI**.**

Web based E-Commerce: Need for web based business, Choosing the right format of website: Characteristics of PR site, Marketing site, Sales site/web-store and vertical & horizontal portals; Steps in setting up business on Internet: Selection & registration of domain name, Website development-client & server side tools, web authoring tools, catalogue & web store tools, Website hosting considerations-own versus rented server; Website Maintenance Online Promotion tools & techniques: Getting links to your site, banner advertisements & measuring advertisement effectiveness, Web Traffic Analysis: Various measures, structure of log file data at server side & its analysis for promotion and tools for analysis, Search Engine optimization techniques, Payment Gateways for online payment, Security of transactions on Web: Selling through Secure Servers, use of digital certificates and international standards. **[No. of Hrs: 12]**

UNIT – II

Intranet, Extranet and VPN: Architecture of Intranet, Intranet Software, Applications of Intranets, Intranet Application Case Studies, Considerations in Intranet Deployment; The architecture of Extranets, Extranet Products & Services, Applications of Extranets, Business Models of Extranet Applications; Virtual Private Network (VPN): Architecture of VPN - service provider dependent & service provider independent configurations, VPN Security-User authentication & Data Security.

Electronic Payment Systems: E-cash: Purchasing & using of e-cash; Electronic Purses their loading with cash and use; E-cheque payment system; Online Third Party Verified Payment System through Credit & Debit Cards & encryption mechanism; ATM based cash disbursement system; Electronic Bill Payment System; 6. Inter bank clearing system.

Security E-Commerce Transactions: Security issues: confidentiality, integrity, authentication, non-repudiation & access control their objectives & techniques; Types of security attacks; Cryptography & Digital Signatures: Symmetric & asymmetric cryptography, Public-Private Key Cryptography, Digital signatures & their use, Public Key Infrastructure (Digital Certificate, Certification Authority, Registration Authority, Key Repository), SSL and SET, Legal issues in cryptography **[No. of Hrs: 12]**

UNIT – III

Business Strategy in an Electronic Age: Impact of Internet on Competition - Porter's Five Forces Model & Business Strategies in Digital Economy; Impact of IT Enabled Systems on Value Chain - Porter's Value Chain Model; Supply Chain & Supply Chain Management: Definition & flows in a supply chain, Evolution of supply chain-JIT & Quick Response Retailing, Push, Pull and Built-to-order model of supply chains, E-commerce enabled supply chain management using Internet, Intranet & Extranet.

Business Process Management: Concepts of Business Process Management & Business Process Reengineering; Call Centre operations: Purpose & functions, mode of operations, Components (Telephony, Web, Application servers & middle ware, Desktop applications); Customer Relationship Management (CRM). **[No. of Hrs: 10]**

UNIT – IV

Technology & Legal Issues in E-Commerce: Technological Issues: Availability of telecom infrastructure, interoperability, bandwidth issues, technical standards & spectrum management, Expansion of Internet: 128 bit IP addressing issue; Legal Issues: Uniform Commercial code for E-commerce (**'Model Law on Electronic Commerce'** by United Nations Commission on International Trade Law, IT Act 2000 by Govt of India), Intellectual Property Protection (Copyrights, Patents, Trademarks & Domain Names), Privacy, Security (storage of electronic messages & their evidence value), Customs & Taxation laws, Role of governments & regulatory bodies, Jurisdiction issues.

Applications of E-Commerce & Case Studies: 1. Case studies & applications of e-commerce in Retailing, Banking, Manufacturing, Airlines & Railway reservation & e-governance; 2. Cyber Crimes. **[No. of Hrs: 10]**

TEXT BOOKS:

[T1] e-commerce: Strategy, Technologies and Applications, David Whiteley, Tata McGraw Hill

[T2] E-Commerce: The Cutting Edge of Business, KK Bajaj & Debjani Nag, McGraw Hill.

REFERENCES:

[R1] The Complete Reference: Internet, Margaret Levine Young, Tata McGraw Hill.

[R2] e-Commerce: Concepts, Models, Strategies, CSV Murthy, Himalayas Publishing House.

[R3] Frontiers of Electronic Commerce, Ravi Kalakota & Andrew B. Wilson, Addison-Wesley (An Imprint of Pearson Education)

[R4] Network Security Essentials: Applications & Standards, William Stallings, Pearson Education.

Skill Enhanced Courses (Any 1)

Paper Title: Artificial Intelligence
Course Code: BCASEC-301 (A)
Credit: 2

UNIT - 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.

UNIT - II

Knowledge representation: Definition and importance of knowledge, Knowledge representation, various approaches used in knowledge representation, Issues in knowledge representation.

Using Predicate Logic: Represent ting Simple Facts in logic, Representing instances and is-a relationship, Computable function and predicate.

UNIT - 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.

UNIT - IV

Expert System: Introduction, Representing using domain specific knowledge, Expert system shells. LISP and other AI Programming Language

TEXTBOOKS:

[T1] E. Rich and K. Knight, "Artificial intelligence", TMH, 2nd ed., 1999.

REFERENCE:

[R1] D.W. Patterson, "Introduction to AI and Expert Systems", PHI, 1999

[R2] Nils J Nilsson,"Artificial Intelligence -A new Synthesis" 2nd Edition (2000), Harcourt Asia Ltd.

TEXTBOOKS:

[T1] W. Stallings, Networks Security Essentials: Application & Standards, Pearson Education, 2000

[T2] TCP/IP Protocol Suite , Behrouz A. Forouzan, “Data Communication and Networking”, Tata Mc Graw Hill,

REFERENCE BOOKS:

[R1] W. Stallings, Cryptography and Network Security, Principles and Practice, Pearson Education, 2000.

Paper Title: Personality Development & Motivation
Course Code: BCASEC-301 (B)
Credit: 2

Unit 1:

Personality, Personality Crisis, Personality Development: Concepts and characteristics, Evolutionary Perspectives, Lifespan Perspective, Influencing Factor,

Unit 2:

Personality Right, Personality Style, Motivation, Laws related to motivation, Types of theories and models, Adaptive performance, Addition, Happiness at work, human behavior

Unit 3:

Organizational Behavior, work engagement, positive education, positive psychology, ways in motivation

Unit 4:

Carrier and motivation, education and motivation, body language and relationship

Semester IV

Core Courses

Paper Title: Web Technologies

Course Code: BCAC-401

Credit: 6

Theory Portion: 4 Credits

UNIT – I

History of the Internet and World Wide Web, Search Engines, News-group, E-mail and its Protocols, Web Portal, Browsers and their versions, Its functions, URLs, web sites, Domain names, Portals.

Static Web Development: HTML - Introduction to HTML, HTML Document structure tags, HTML comments, Text formatting, inserting special characters, anchor tag, adding images and Sound, lists types of lists, tables, frames and floating frames, Developing Forms, Image maps.

UNIT – II

Introduction to Java Script: Data Types, Control Statements, operators, Built in and User Defined Functions, Objects in Java Script, Handling Events.

Cascading Style Sheet: Types of Style Sheets – Internal, inline and External style sheets, creating styles, link tag.

UNIT – III

DHTML : Introduction to DHTML, JavaScript & DHTML, Document Object Model, Filters and Transitions, DHTML Events, Dynamically change style to HTML Documents.

UNIT – IV

Introduction to WYSIWYG Design tools, Introduction to Dreamweaver, Website Creation and maintenance, Web Hosting and Publishing Concepts, XML: Introduction to XML-Mark up languages, Features of Mark up languages, XML Naming rules, Building block of XML Document, Difference between HTML & XML, Components of XML, XML Parser, DTD's Using XML with HTML and CSS

TEXT BOOKS

[T1] The complete reference HTML, by Thomas A powell, TMH publication.
[T2] Mastering HTML 4.0 by Deborah S. Ray and Erich J. Ray. BPB Publication.

[T3] Internet and World Wide Web Deitel HM, Deitel ,Goldberg , Third Edition

Practical Portion: 2 Credits

1. Writing different HTML pages using HTML commands
2. Creating Web pages
3. Writing HTML documents for Basic styles, creating lists, Adding links, adding images to a
4. Web page.
5. Program using image map for navigation
6. Program for creating frames, creating HTML forms.
7. Programs for creating tables of data.
8. Creating dynamic web pages
9. Solution of different common problems using JAVA
10. Solution of different problems using arrays.
11. Writing programs for inheritance, polymorphism, operator overloading
12. Writing program for multithreading handing.
13. Applet programming and tagging of applet in HTML document.

Paper Title: Java Programming
Course Code: BCAC-402
Credit: 6
Theory Portion: 4 Credit

UNIT-I

Java Programming: Introduction, Data types, acces specifiers, operators, control statements, arrays.

Classes: Fundamentals, objects, methods,constructors.

Inheritance: Super class,sub class,this and super operator, method overriding, use of final, packages, abstract class, interface.

Polymorphism: Method overloading, constructor overloading. [T1, R1]

UNIT – II

Exception Handling: Exception Class, built in checked and unchecked exceptions, user defined exceptions, use of try, catch, throw, throws, finally.

Multi threaded programming: Overview, comparison with multiprocessing ,Thread class and runnable interface, life cycle, creation of single and multiple threads, thread priorities, overview of Synchronization.

Java Library: String handling (only main functions), String Buffer class.

Elementary concepts of Input/Output :byte and character streams, System.in and Sysem.out, print and println, reading from a file and writing in a file. [T1, R1]

UNIT – III

Software Development using Java:

Applets :Introduction, Life cycle, creation and implementation,

AWT controls: Button, Label,TextField, TextArea, Choice lists, list, scrollbars, check boxes, Layout managers,

Elementary concepts of Event Handling :Delegation Event Model, Event classes and listeners, Adapter classes, Inner classes.

Swings: Introduction and comparison with AWT controls. [T1, R1]

UNIT – IV

Networking Basics: Socket (datagram and TCP/IP based client and server socket), factory methods, InetAddress

JDBC: JDBC Architecture, JDBC Drivers, Connecting to the Database

Introduction to Java Servlets: Life cycle,Interfaces and classes in javax.servlet package(only description) Creating a simple servlet[T1, T2, R1, R2]

TEXT BOOKS:

[T1] Patrick Naughton and Herbert Schildt, “Java-2 The Complete Reference”, TMH.

[T2] Y. Daniel Liang, “Introduction to Java Programming, Comprehensive Version, 7/e” Pearson.

REFERENCE BOOKS: -

[R1] Krishnamoorthy R, Prabhu S ,"Internet and Java Programming", New Age Intl.

[R2] David Flanagan, Jim Farley, William Crawford and Kris Magnusson, "Java Enterprise in a Nutshell", O'Reilly.

Practical Portion: 2 Credits

1. Program to illustrate the use of classes and objects
2. Program to illustrate the use of String Class
3. Program to illustrate the use of final and static keyword
4. Program to illustrate the use of inheritance
5. Program to illustrate the use of interfaces
6. Program to illustrate the use of packages
7. Program to illustrate the use of multithreading
8. Program to illustrate the use of Exception handling
9. Program to illustrate the use of Utility classes
10. Program to create and read file.
11. Program to create applet and pass parameter to it
12. Program to illustrate handling of mouse event Other than these, possible lab exercises related to syllabus can also be included.

Paper Title: Software Engineering
Course Code: BCAC-403
Credit: 6

UNIT – I

Introduction: Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models

Software Requirements analysis & specifications: Requirement engineering, requirement elicitation techniques like FAST, QFD, Requirements analysis using DFD(with case studies), Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS.[T1][T2] [T3]

UNIT – 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.[T1][T2][T3]

UNIT - III

Software Design: Cohesion & Coupling, Classification of Cohesiveness & Coupling, Layered arrangement of modules, Function Oriented Design, Object Oriented Design[T1][T2]

Software Metrics: Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics.[T1][T2]

UNIT - IV

Software Testing: Code Review, Testing Process, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing(Performance Testing and Error Seeding), Debugging Activities. [T1][T2][R1]

Software Maintenance: Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.[T1][T3]

TEXT Books:

[T1] K. K. Aggarwal & Yogesh Singh, “Software Engineering”, 2nd Ed., New Age International, 2005.

[T2] Rajib Mall, “Fundamental of Software Engineering”, 3rd Edition, PHI Learning Private Limited

[T3] I. Sommerville, "Software Engineering", 9th Edition, Pearson Edu.

REFERENCE:

[R1] Jibitesh Mishra and Ashok Mohanty, "Software Engineering", Pearson

[R2] R. S. Pressman, "Software Engineering – A practitioner's approach", 5th Ed., McGraw Hill Int. Ed., 2001.

[R3] James Peter, W. Pedrycz, "Software Engineering: An Engineering Approach", John Wiley & Sons.

Generic Elective Courses (Any 1)

Paper Title: Data Ware Housing & Data Mining
Course Code: BCA GE-401 (A)
Credit: 6

UNIT – I

Data mining: Introduction, Data mining – on what kind of data, data mining functionalities – what kind of patterns to be mined, Classification of data mining systems, data mining task primitives, integration of a data mining systems with a database or data warehouse systems, major issues in data mining.

Data preprocessing: Descriptive data summarization, data cleaning, data integration and transformation, data reduction, data descretization and concept hierarchy generation.

UNIT – II

Data warehouse and OLAP technology: What is data warehouse, A multidimensional datamodel, data warehouse architecture, data warehouse implementation, data warehouse usage, OLAP, OLAM

Mining frequent patterns, association and correlation, efficient and scalable frequent itemset mining methods, From association mining to correlation analysis.

UNIT – III

Classification and prediction: Introduction, issues, classification by decision tree induction, rule based classification, classification by back propagation, lazy learners, other classification methods, Prediction: accuracy and error measures, evaluating the accuracy of a classifier or predictor.

Cluster Analysis: Types of data in cluster analysis, a categorization of major clustering methods, partitioning methods.

UNIT – IV

Mining complex types of data: Multidimensional analysis and descriptive mining of complex data objects, mining spatial database, multimedia database, mining world wide web.

Applications and trends in data mining: Data mining applications, data mining system products and research prototypes, social impact of data mining, trends in data mining.

TEXT BOOKS:

[T1] Kamber and Han, "Data Mining Concepts and Techniques", Hartcourt India P. Ltd.,2001.
[T2] Paul Raj Poonia, "Fundamentals of Data Warehousing", John Wiley & Sons, 2000

REFERENCE BOOKS:

[R1] Margaret Dunham, " Data Mining: Introductory and Advanced Topics, 1/e", Pearson [R2] G. K. Gupta, "Introduction to Data Mining with Case Studies", PHI, 2006.
[R3] W. H. Inmon, "Building the Operational Data Store",2nd Ed., John Wiley, 1999
[R4] B. M. Shawkat Ali, Saleh A. Wasimi, "Data Mining Methods and Techniques", Cengage Learning, 2009

Paper Title: Mobile Computing
Course Code: BCA GE-401 (B)
Credit: 6

UNIT – I

Introduction to wireless communications: Applications, Short History of Wireless Communications, Market of Mobile Communications. [T1]

Elementary Knowledge on Wireless Transmission: Frequency of Radio Transmission, Signals, Antennas, Signal Propagation: Path Loss of Radio Signals, Additional Signal Propagation Effects, Multipath Propagation, Multiplexing: Space Division Multiplexing, Frequency Division Multiplexing, Time Division Multiplexing, Code Division Multiplexing, Modulation: Amplitude Shift Keying, Frequency Shift Keying, Phase Shift Keying, Advanced Frequency Shift Keying, Advanced Phase Shift Keying, Multicarrier Modulation, Spread Spectrum: Direct Sequence Spread Spectrum, Frequency Hopping Spread Spectrum, Cellular Systems. [T1]

UNIT – II

Elementary Knowledge on Medium Access Control: Motivation for a specialized MAC, Hidden and exposed terminals, Near and far terminals, Introduction to SDMA, FDMA, TDMA: Fixed TDM, Classical Aloha, Slotted Aloha, Carrier sense multiple access, Demand

assigned multiple access, PRMA packet reservation multiple access, Reservation TDMA, Multiple access with collision avoidance, Polling, Inhibit sense multiple access, CDMA, Spread Aloha multiple access, Mobile communications, Comparison of S/T/F/CDMA. [T1]
Elementary Knowledge on Telecommunications Systems: GSM: Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, New data services, DECT: System architecture, Protocol architecture.[T1]

Elementary Knowledge on Satellite systems: History, Applications, Basics: GEO, LEO, MEO, Routing, Localization, Handover. [T1]

UNIT – III

Mobile Internet: Introducing the Mobile Internet, Services for the mobile Internet, Business opportunities.[T2]

Implementing WAP Services: WML: WML Variables and Contexts: Variable Substitution, Setting Variables, Browser Contexts, WML Tasks and Events, WML User Interaction: Problems with Web Interaction, Interaction in WAP, Elements: <input> , <select> ,<option>, <optgroup>, <do> , <anchor> , <a> , The tabindex Attribute, WML Timers, WML Decks, Templates, and Cards: Elements: <wml>, <head>, <access>, <meta> , <card> , <template>, WML Text and Text Formatting, Elements <p>,
, Character Formatting, Tables, WML Images: <img> Element, The WBMP Image Format. [T2, T3]

UNIT – IV

WAP: the Mobile Internet Standard, Making the Internet Mobile: Challenges and Pitfalls, Overview of the Wireless Application Protocol [T2]

Implementing WAP Services: WML Script: Datatypes, Variables, and Conversions, Operators and Expressions: Operand Conversions, Assignment Operators, Arithmetic Operators, Bitwise Operators, Shift Operators, Logical Operators, Increment and Decrement Operators, Comparison Operators, Type Operators, The Conditional Operator, The Comma Operator, Precedence and Associativity, WMLScript Statements: Expressions as Statements, Blocks of Statements, Conditions, Loops, Returning from a Function, Other Statements, WMLScript **Functions:** Function Declarations, Function Calls, Calls to Other Script Units, Calling WMLScript from WML, Standard Libraries, WMLScript Pragmas: The access Pragma, The meta Pragma, Elementry Knowledge on Libraries: Lang , Float , String ,URL , WMLBrowser , Dialogs [T2, T3]

TEXT BOOKS

[T1] Jochen Schiller, “Mobile Communications”, PHI/Pearson Education, Second Edition, 2003.

[T2] Sandeep Singhal, “The Wireless Application Protocol, Writing Applications for Mobile Internet”, Pearson Education, 2000
[T3] Learning WML, and WMLScript, Programming the Wireless Web, Martin Frost, Publisher: O'Reilly 2000

REFERENCE BOOKS

[R1] William Stallings, “Wireless Communications and Networks”, PHI/Pearson Education, 2002
[R2] Theodore S Rappaport, “Wireless Communication Principles and Practice”, 2nd Ed, Pearson Education. 2002
[R3] C. Y. Lee and William, “Mobile Cellular Telecommunications”, 2nd Ed, McGraw Hill. 2001

Skill Enhanced Courses (Any 1)

Paper Title: Cyber Security & Laws
Course Code: BCASEC-401 (A)
Credit: 2

Unit-I

Information Security, Cyber Security, Information Assurance, Cyber Crime- Meaning, Types, Need, Function

Unit-II

Information Policy- Meaning, Types, Need, Function, Case Studies, Need, Convergence, Information Divide, Digital Divide, Information Literacy, Network Literacy, Digital Humanities & Sociology, Information and IT Policy as a Discipline and Degrees worldwide

Unit-III

Information Technology Act, Information Security Protocols, Non-repudiation services, related protocols, Fairness in Information Exchanges Protocols

Unit-IV

Trusted Third Party, its use as Adjudicator, message authenticator, Information Security standards, Information Security Infrastructure.

Unit-V

International Information Act & IT Act, Right to Information Act-2005 with Process, Features and Functions, IT Act 2000-Role, Features, Summary, Changes, Data Privacy Rules, Real life Example of IT Act uses, Emerging Cyber Act in India

Text/References:

1.Kahin, B., & Nesson, C. (1996). *Borders in cyberspace: Information policy and the global information infrastructure*. MIT Press.

2. Kamisar, Y. (1980). *Police interrogation and confessions: Essays in law and policy* (p. 1). Ann Arbor, MI: University of Michigan Press.

3. Holtshouse, D. K. (2013). *Information technology for knowledge management*. U. M. Borghoff, & R. Pareschi (Eds.). Springer Science & Business Media.

Paper Title: SEO
Course Code: BCASEC-401 (B)
Credit: 2

Unit-1

Search Engine Optimization and its meaning, features, function and need. Search Engine Optimization and Google, Indexing Methods, Search Engines its features, history, emerging search engines, search strategies

Unit-2

Ranking Concept, Long tail-concept and theory, why content is a king?, SEO Copywriting, Content Development and its features with style, Content Designing, Content Management, Content Management Systems, Content Engineering, Role of Search Engine Optimization in Digital Marketing

Unit-3

On Page SEO-Concept of Content, URL Structure, Pictures in On Page Optimization, Title Tag & Meta Tag in On Page Optimization, Headline Tag, Internal Linking

Unit-4

Off Page Optimization, Linking Approaches, Use Of Social Media, Use of Email on Off Page Optimization promotion, identifying a keywords, long-tail keywords, checking web analytics, keyword research tools, search for keywords

Unit-5

Tariff and SEO, Leads/ROI, Indexed Pages, Inbound Links, Keywords, Ranking, Creating list of Keywords, building keyword focused webpage, setup a blog, creating a link building plan, PPC Advertisement, Webmaster edge, site maps, use of color and psychology

Text/References:

1. Ledford, J. L. (2015). Search Engine Optimization Bible (Vol. 584). John Wiley & Sons.
2. Kent, P. (2012). Search engine optimization for dummies. John Wiley & Sons.
3. Amerland, D. (2013). Google Semantic Search: Search Engine Optimization (SEO) Techniques That Get Your Company More Traffic, Increase Brand Impact, and Amplify Your Online Presence. Que Publishing.

Semester V

Core Courses

Paper Title: Computer Networks
Course Code: BCAC-501
Credit: 6

Unit - I

Basic Concepts: Components of data communication, distributed processing, 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.T[1], T[2]

Unit – II

Telephony: Multiplexing, error detection and correction: 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 overview. ISDN: Services, historical outline, subscriber's access, ISDN, Layers, and broadband ISDN. T[1], T[2]

Unit-III

Devices: Repeaters, bridges, gateways, routers, The Network Layer, Design Issues, Network Layer Addressing and Routing concepts (Forwarding Function, Filtering Function);Routing

Methods (Static and dynamic routing, Distributed routing, Hierarchical Routing);Distance Vector Protocol, Link State protocol. T[1], T[2]

Unit – IV
Transport and upper layers in OSI Model: Transport layer functions, connection management, Functions of session layers, Presentation layer, and Application layer. T[1], T[2]

Text Books
T[1]. A. S. Tenanbaum, "Computer Networks"; Pearson Education Asia, 4th Ed., 2003.

T[2]. Behrouz A. Forouzan, "Data Communication and Networking", 2nd edition, Tata Mc

Graw Hill.

.

Reference Books
R[1]. D. E. Comer, "Internetworking with TCP/IP", Pearson Education Asia, 2001.

R[2]. William Stallings, "Data and computer communications", Pearson education Asia, 7th

Ed., 2002.

Paper Title: Operating System
Course Code: BCAC-502
Credit: 6

UNIT – I

Introduction: What is an Operating System, Simple Batch Systems, Multiprogrammed 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

UNIT – 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

UNIT – 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

UNIT – IV

Information Management: Introduction, A Simple File System, General Model of a File System, Types of File System File-System Interface: File Concept, Access Methods, Directory Structure, Protection: Goals of protection, Domain of protection, Access rights, Consistency Semantics Security: Authentication, Program threats, System threats, Encryption.

TEXT:

[T1] Silbersachatz and Galvin, "Operating System Concepts", John Wiley & Sons, 7th Ed. 2005

[T2] Haldar/Aravind, "Operating System", Pearson Edu.

REFERENCES:

[R1] Madnick E., Donovan J., "Operating Systems", Tata McGraw Hill, 2001

[R2] Tannenbaum, "Operating Systems", PHI, 4th Edition, 2000
[R3] An Introduction to Operating Systems: Concepts & Practice, Bhatt, PHI

Discipline Specific Courses (DSE) –Any 1

Paper Title: Information Systems & Management
Course Code: BCADSE-501 (A)
Credit: 6

Unit-1
Information Systems as a Field, Information Systems Function, Information Systems Professionals, IS Development, IS for Development, Carrier opportunities as Information Systems, Management Science with its principles, Management in Information Systems

Unit-2
Introduction to Information Systems, shift in Information system thinking, latest trends in Information Technology, Use of computers for managerial applications, Technology issues and data and information processing in organizations

Unit-3
Computer Based Information Systems- office automation systems, decision making and MIS, transaction processing systems, decision support system, Group Decision Support, Executive Information systems, DSS generator, Artificial Intelligence based systems, end user computing, distributed data processing

Unit-4
Knowledge Management, Business system, deciding on IS architecture, IT leadership & IS strategic planning, IS strategy and effects of IT on competition**,** ERP, re-engineering work processes for IT applications, Business Process Redesign

Unit-5
Information Systems beyond MIS, Information Systems and Domain based Nature, Geo Information Systems, Bio Information Systems, Health Information Systems, Environmental Information Systems, Educational Information Systems

Text/References:
1.Management Information System, O'Brien, TMH
2. Management Information System: A Concise Study,Kelkar,PHI
3.Decision support Systems, Janaki Raman, PHI
4 Business Information Systems, Munish Kumar, VIKAS
5.Business Application of Computers, M.M. Oka, EPH

Paper Title: Multimedia and its Application
Course Code: BCADSE-502 (B)
Credit: 6

UNIT-I

Introductory Concepts: Multimedia - Definitions, Basic properties and medium types.(Temporal and non temporal) . Multimedia applications Uses of Multimedia, Introduction to making multimedia - The Stages of project, the requirements to make good multimedia, Multimedia skills and training .

Multimedia-Hardware and Software: Multimedia Hardware - Macintosh and Windows production Platforms, Hardware peripherals - Connections, Memory and storage devices, Media software - Basic tools, making instant multimedia, Multimedia software and Authoring tools, Production Standards. [T1,T2,R1]

UNIT-II

Multimedia building blocks Creating & Editing Media elements: Text, image, Sound, animation Analog/ digital video Data Compression: Introduction, Need, Difference of lossless/lossy compression techniques. Brief overview to different compression algorithms concern to text, audio, video and images etc .[T1,T2,R3]

UNIT-III

Multimedia and the Internet: History, Internet working, Connections, Internet Services, The World Wide Web, Tools for the WWW - Web Servers, Web Browsers, Web page makers and editors, Plug-Ins and Delivery Vehicles, HTML, Designing for the WWW -Working on the Web, Multimedia Applications - Media Communication, Media Consumption, Media Entertainment, Media games.[T2.R2]

Multimedia-looking towards Future: Digital Communication and New Media, Interactive Television, Digital Broadcasting, Digital Radio, Multimedia Conferencing, Virtual Reality, Digital Camera. Assembling and delivering a Multimedia project-planning and costing, Designing and Producing, content and talent, Delivering, CD-ROM: The CD family, production process, CD-i – Overview – Media Types Technology.[T2,R2]

TEXTBOOKS:

[T1] Tay Vaughan, “Multimedia: Making it work”, TMH, 1999.
[T2] Ralf Steinmetz and Klara Naharstedt, “Multimedia: Computing, Communications Applications”,Pearson, 2001.

REFERENCES:

[R1] Keyes, “Multimedia Handbook”, TMH, 2000.
[R2] Steve Heath, “Multimedia & Communication Systems”, Focal Press, UK, 1999. [R3] K.

Andleigh and K. Thakkar, “Multimedia System Design”, PHI, PTR, 2000. [R4] Steve Rimmer, “Advanced Multimedia Programming”, MHI, 2000

Paper Title: IT Project Management with Ethics
Course Code: BCADSE-502 (A)
Credit: 6

Unit-I

Project Management, Approaches of Project Management, Processes and Topics of Project Management, Software and Network Project Management, IT Projects and its dealing, Qualities needed for IT Project Management

Unit-II

Engineering and Computing/Informatics profession: Ethical issues in Informatics practice. Conflicts between business demands and professional ideals, Social and ethical Responsibilities of Technologists.

Unit-III

Codes of professional ethics, Whistle blowing and beyond, Case studies, Profession and Human Values Value Crisis in contemporary society. Nature of values: Value Spectrum of a ‘good’ life

Unit-IV

Information and Computing Professions with its emerging nature, Chief Technology Officer, Information Scientist, Computer Scientist, IT Officer, Web Analyst, SEO Engineer, Web Administrator, Database Administrator, Chief Information Officer, Chief Digital Officer, Network and System Administrator, Information Manager, Knowledge Broker, System Engineer, Software Engineer—their basics with roles and comparisons, Job Opportunities

Text/References:

1.Blending the best of the East & West, Dr. Subir Chowdhury, EXCEL
2.Ethics & Mgmt. & Indian Ethos, Ghosh, VIKAS
3.Business Ethics,Pherwani,EPH
4.Ethics,Indian Ethos & Mgmt., Balachandran,Raja,Nair, Shroff Publishers
5.Business Ethics: concept and cases, Velasquez, Pearson

Paper Title: Advance Network Technologies
Course Code: BCADSE-502 (B)
Credit: 6

UNIT-I

Introduction to Network Programming: OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

UNIT-II

Sockets : Address structures, value – result arguments, Byte ordering and manipulation function and related functions Elementary TCP sockets – Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related function.

UNIT-III

TCP client server : Introduction, TCP Echo server functions, Normal startup, terminate and signal handling server process termination, Crashing and Rebooting of server host shutdown of server host.

UNIT-IV

I/O Multiplexing and socket options: I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option.

UNIT-V

Elementary UDP sockets: Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP. Elementary name and Address conversions: DNS, gethost by Name function, Resolver option.

Semester VI

Core Courses

Paper Title: Web Programming (PHP)

Course Code: BCAC-601

Credit: 6

Theory Portion: 4 Credit

UNIT – I

Introduction to web applications, HTML, Client Side Scripting Vs Server Side Scripting, Web Servers : Local Servers and Remote Servers, Installing Web servers, Internet Information Server (IIS) and Personal Web Server (PWS). Static website vs Dynamic website development.

UNIT – II

Introduction to PHP, Start and End Tags of PHP, Data types in PHP, Variables, Constants, operators and Expressions, printing data on PHP page, Control statements – if, switch case, for, while, do while.

Arrays: Initialization of an array, Iterating through an array, Sorting arrays, Array Functions, Functions: Defining and Calling Functions, Passing by Value and passing By references, Inbuilt Functions.

UNIT – III

Working with Forms: Get and Post Methods, Querystrings, HTML form controls and PHP, Maintaining User State: Cookies, Sessions, Application State.

Working With Files: Opening and Closing Files, Reading and Writing to Files, Getting Information on Files

UNIT – IV

PHP Database Connectivity: Introduction to MYSQL, Creating database and other operations on database, connecting to a database, Use a particular database, Sending query to database, Parsing of the query results, Checking data errors.

TEXT BOOKS:

[T1] Programming PHP. Rasmus Lerdorf, Kevin Tatroe. (O'Reilly, ISBN 1565926102).

[T2] PHP, MySQL, and JavaScript: A Step-By-Step Guide to Creating Dynamic Websites by Robin Nixon O'Reilly Media; 1 edition

REFERNCE BOOKS:

[R1] Core PHP Programming. Leon Atkinson (Prentice Hall, ISBN 0130463469).

[R2] Beginning PHP5 and MySQL: From Novice to Professional, W. Jason Gilmore, 2004, Apress, ISBN: 1-893115-51-8

Practical Portion: 2 Credits

1. Introduction to XML :Introduction to XML and its need-XML Revolution – Data Revolution - XML Revolution – Architectural and Software revolution-The XML Technology family-Structure and data typing-The XML Technology family-Presentation Technologies The XML Technology family- Manipulation Technologies.

2. XML Presentation, Manipulation Technologies: XML Document rule-XML structuring rule and Related Data type-XML presentation – CSS – XSL- XSLT (operations) –XPath, Xlink and XQuery-Introduction to XSL-FO-XML – Forms-Uses of Voice XML with a block diagram.

3. Asynchronous Javascript and XML – AJAX :Introduction and Need for AJAX-AJAX Basics - AJAX Architecture-Ajax Web Application Model-Ajax Patterns - Ajax control Toolkit - Ajax controls

4. SOAP Protocol & Web Services: Purpose of SOAP - SOAP Protocol-Approaches to SOAP-SOAP Architecture-XML-RPCStructure of HTTP Request-Introduction to SOAP faults-Concepts of SOAP Attachments-Introduction to Web Services-UDDI Model & Security on XML.

5. Semantic Web :Introduction to Semantic Web: Needs, Evolution. Types of Data etc.,-Levels of Semantics-The layered Architecture: URI, UNICODE, XML NS, RDF-The layered Architecture: Ontology, logic, proof, trust and Digital signature-Un-Resource Description Framework (RDF)-Web Ontology Language (OWL).

Paper Title: System Analysis and Designing
Course Code: BCAC-602
Credit: 6

Unit-I

Information Systems, Types and Overview, Information Analysis, Systems Analysis, Software Analysis, IT Management Analysis, Professionals and Tools associated with Information SAD, Data Analysis with Analytics

Unit-II

Overview of System analysis and design: Development life cycle (Waterfall, Spiral, incremental models), feasibility studies, Requirements determination, Logical design, Physical design, Program design, Risk and feasibility analysis, prototyping

Unit-III

Information requirement analysis: Process modelling with physical and logical data flow diagrams, Data modelling with entity relationship diagrams, Normalization upto 3NF

Unit-IV

System design: Process descriptions, Input/output controls, object modelling, Database design, User Interface design, Documentation, Data Dictionary

Unit-V

Development methodologies: Top down, bottom up, structured chart, decision table, decision tree, CASE productivity tools.
Testing – Unit, integration, system, Acceptance, regression, Test Case generation

Text/References:

1.System Analysis & Design, Parthasarathi, EPH
2. Analysis & Design of Information Systems,Rajaraman,PHI
3.Analysis & Design of Information Systems, Senn , MH
4.Information Systems: Analysis and Design,Ram Bansal ‘Vigyacharya’,New Age International.
5.System Analysis, Design & MIS, EXCEL BOOKS
6.Analysis, Design & Implementation of Information System, Sharma, VIKAS
7.System Analysis & Design, V.K. Jain, Wiley Dreamtech

Discipline Specific Courses (DSE) - Any 1

Paper Title: E-Learning Technologies
Course Code: BCADSE-601 (A)
Credit: 6
Theory Portion: 4 Credits

Unit 1

E-learning theory, Meaning, Definition, Types, Characteristics, E-Learning History, Advantages of E Learning

Unit 2

Trends in E Learning, Technologies involved with E-Learning, Database & E-learning, Multimedia & E-learning, Web Technology & E-learning, Network Technologies & E-learning

Unit 3

Similar and Allied Technologies: Online Education, Education Technology, Virtual Learning, LMS-Meaning and Features, Synchronous and Asynchronous methods

Unit 4

Tools for creation of E Learning, Micro Learning and Advantages, E Learning Principles, Cloud Computing for E Learning

Unit 5

An Account of E Learning Software, Media for E Learning, Inside into the MOOC, E Learning Projects in International Context and India

Practicals

- Live utilization of NPTEL, Virtual Labs, Talk to Teachers, Spoken Tutorial,
- Live utilization of E Yantra, INFLIBNET,
- Live utilization of Quantum and Nano Computing, ERP Mission,
- Live utilization of Virtual Learning Environment,
- Live utilization of Aakash Educational Portal, OSS, SOS Tools,
- Live utilization of Scopus, Google Scholar, INSPEC, IDEAS,
- Live utilization of YouTube as an Educational Medium

Discipline Specific Courses (DSE)

Paper Title: Emerging Trends in IT & Computing
Course Code: BCADSE-601 (B)
Credit: 6

Unit-I

Parallel Computing: Concept, Features and Emerging Trends-*Mobile Computing*: Mobile connectivity- Cells, Framework, wireless delivery technology and switching methods, mobile information access devices, mobile data internetworking standards, cellular data communication protocols, mobile, computing applications. Mobile databases - protocols, scope, tools and technology. M-business.

Unit-II

Electronic Commerce: Framework, Media Convergence of Applications, Consumer Applications, Organisation Applications. Electronic Payment Systems: Digital Token, Smart Cards, Credit Cards, Risks in Electronic Payment System, Designing Electronic Payment Systems. Electronic Data Interchange (EDI): Concepts, Applications, (Legal, Security and Privacy) issues, EDI and Electronic Commerce, Standardization and EDI, EDI Software Implementation. EDI Envelope for Message Transport, Internet-Based EDI.

Unit-III

Software Agents: Characteristics and Properties of Agents, Technology behind Software Agents (Applets, Browsers and Software Agents), Broadband Telecommunications: Concepts, Frame Relay, Cell Relay, Switched Multimegabit Data Service

Unit-IV

Asynchronous Transfer Mode. Main concepts in Geographical Information Systems (GIS), E-cash, E-Business, ERP packages.

Text/References:

1.Laudon, Kenneth C., and Jane Price Laudon. Management information systems. Vol. 8. New Jersey: Prentice Hall, 2011.
2.Lucey, T. (2005). Management information systems. Cengage Learning EMEA.
3.Leeuwen, J. V., Hartmanis, J., & Goos, G. (1995). Computer science today: recent trends and developments. Springer-Verlag New York, Inc..
4.Ten Teije, A., Miksch, S., & Lucas, P. (Eds.). (2008). Computer-based medical guidelines and protocols: a primer and current trends (Vol. 139). Ios Press.

5.Davis, C. H., Shaw, D., Katz, J. M., Tejedor, F. J., Allard, C. K., Allard, K., & Martín, A. G. (2011). Introduction to information science and technology (No. 004 004). e-libro, Corp..
6.Pour, M.K. (2015), Encyclopedia of information science and technology, 3rd Edition, IGI Global, USA

Paper Title: Project/ Dissertation
Course Code: BCADSEPRO
Credit: 6

रायगञ्ज यूनिभार्सिटि
तमसो मा ज्योतिर्गमय
Estd. 2015

BCA Program *with CBCS*

Department of Computer and Information Science

Raiganj University, Raiganj,

Uttar Dinajpur, West Bengal, India