Kalinga University Atal Nagar (C.G.)

SCHEME OF EXAMINATION
& SYLLABUS

of

BCA
(Bachelor in Computer Application)

UNDER

Faculty of Information Technology

w.e.f. Session 2021-22

Kalinga University,
Naya Raipur,Chhattisgarh
(Bachelor in Computer Application)
(W.e.f. 2021 – 2022)

Semester - I

Subject Code	Subject Name	Credit	Internal	External	Total
BCA101	Mathematics - I	3	30	70	100
BCA102	Fundamentals of Information Technology	4	30	70	100
BCA103	Programming for Problem Solving Using 'C++'	4	30	70	100
	(Choose Any One) 101A/101B	2	15	35	50
BCA104A	Environmental Studies				
BCA104B	NCC				
BCA105	Digital Electronics	3	30	70	100
BCA106P	Fundamentals of Information Technology Lab	1	20	30	50
BCA107P	Programming for Problem Solving Using 'C' Lab	1	20	30	50
		18	**175**	**375**	**550**

Semester – II

Subject Code	Subject Name	Credit	Internal	External	Total
BCA201	Statistical Methods	3	30	70	100
BCA202	Data Structures Using C++	4	30	70	100
BCA203	Database Management Systems (DBMS)	4	30	70	100
BCA204	Financial Accounting	3	30	70	100
	(Choose Any One) 204A/201B	2	15	35	50
BCA205A	English				
BCA205B	NCC				
BCA206P	Data Structures Using C++ Lab	1	20	30	50
BCA207P	Database Management System (DBMS) Lab	1	20	30	50
		18	**175**	**375**	**550**

* Student has to undergo for Internship Assessment completion of 2nd Semester which is to be evaluated in 3rd Semester

Semester - III					
Subject Code	**Subject Name**	**Credit**	**Internal**	**External**	**Total**
BCA301	Programming in Java	4	30	70	100
BCA302	Web Development with PHP	4	30	70	100
BCA303	Design and Analysis of Algorithm	4	30	70	100
BCA304	Principles of Management	3	30	70	100
BCA305	Operating System	4	30	70	100
BCA306P	Programming in Java Lab	1	20	30	50
BCA307P	Web Development with PHP	1	20	30	50
BCA308P	Mini Project/Internship Assessment	1	30	70	100
		22	**220**	**480**	**700**

Semester - IV					
Subject Code	**Subject Name**	**Credit**	**Internal**	**External**	**Total**
BCA401	Computer Graphics & Multimedia Application	4	30	70	100
BCA402	Software Engineering and Testing	4	30	70	100
BCA403	Data Mining and Warehousing	4	30	70	100
BCA404	Optimization Techniques	3	30	70	100
BCA 405	Entrepreneurship Development	3	30	70	100
BCA406P	Python Programming Lab	1	20	30	50
BCA407P	Computer Graphics & Multimedia Application Lab	1	20	30	50
BCA408P	Software Engineering and Testing Lab	1	20	30	50
		21	**210**	**440**	**650**

* Student has to undergo for Internship Assessment completion of 4th Semester which is to be evaluated in 5th Semester

Semester – V					
Subject Code	**Subject Name**	**Credit**	**Internal**	**External**	**Total**
BCA501	Mobile Application Development	4	30	70	100
BCA502	Linux Server Administration	4	30	70	100
BCA503	Computer Network	4	30	70	100
BCA504	**Elective-I**	4	30	70	100
BCA504A	Embedded Systems				
BCA504B	Natural Language Processing				
BCA504C	Enterprise Resource Planning				
BCA505	**Elective-II**	4	30	70	100
BCA505A	Green Computing				
BCA505B	Image Processing				
BCA505C	Big Data Analytics				
BCA506P	Mobile Application Development Lab	1	20	30	50
BCA507P	Linux Server Administration Lab	1	20	30	50
BCA508P	Internship Assessment	1	30	70	100
		23	220	480	700

\begin{center}**Semester - VI**\end{center}					
Course Code	**Title of Paper**	**Credit**	**Internal**	**External**	**Total**
BCA601	Cloud Computing	4	30	70	100
BCA602	**Elective-III**	4	30	70	100
BCA602A	Artificial Intelligence and Machine Learning				
BCA602B	Advance Neural Network & Deep Learning				
BCA602C	Internet Of Things				
BCA603	**Elective-IV**	2	30	70	100
BCA603A	Digital Marketing and Business Analytics				
BCA603B	Ethical Hacking				
BCA603C	IT Security				
BCA604	Soft Skills & Personality Development	3	30	70	100
	Practical (602A, 602B, 602C,)	1	20	30	50
BCA605P(A)	Artificial Intelligence and Machine Learning				
BCA605P(B)	Advance Neural Network & Deep Learning				
BCA605P(C)	Internet Of Things				
BCA606P	Major Project	3	50	150	200
		18	**190**	**460**	**650**

SEMESTER – I

Mathematics – I
(BCA101)

Course Objectives:

- To understand concepts and operations in Set Theory and Relations.
- To understand concepts and operations in Matrices and Determinant.
- To understand fundamentals of Reasoning.
- To provide foundations of Probability theory& Logic.
- To provide foundations of Statistics related to data analysis.

Course Outcomes:

- Student will be able to perform Mathematical Operations like Set operations, Matrix operations
- Student will be able to perform Statistical operations like mean, mode, and median on given datasets.
- Understand and practice Mathematical relations and functions & probability theory.
- Understand and practice Determinant, Matrices& Logic.

UNIT – I

Sets and elements: power set, universal set, union and intersection of sets, difference of sets, complement of a set, ordered pairs, Cartesian product of sets, number of elements in the Cartesian product of two finite sets. Equality of sets, transitivity of set inclusion, universal set,complement of a Set, Subsets Proper and Improper Subsets, Union of Sets, properties of Union. operation, intersection of sets, disjoint sets, properties of intersection operation, relative complement of a set, De Morgan'sLaws, Distributive Laws of Union and Intersection. Definition of Relation: Pictorial Diagrams, Co-domain and Range of a relation.

UNIT - II

Function as a special kind of relation from one set to another. Pictorial representation of a function, domain, co-domain & range of a function. Real valued function of the real variable, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum and greatest integer functions with their graphs. Sum, difference, product and quotients of functions. Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions, composite functions, inverse of a function. Binary operations. Fundamental principle of counting. Factorial n. (n!), permutations and combinations.

UNIT - III

Determinant: Determinant of 3rd order, Cramer's rule, consistency of equations Matrices: types of matrices, algebra of matrices, linear homogeneous equations, linear nonhomogeneous equations.

UNIT - IV

Mathematical reasoning: mathematically acceptable statements. connecting words/ phrases – consolidating the understanding of "if and only if (necessary and sufficient) condition", "implies", "and/or", "implied by", "and", "or", "there exists" and their use through variety ofexamples related to real life and mathematics. Definition of statistics, raw data, classification

of data, average, scatter, range, relationshipbetween mean, median, mode, dispersion, mean deviation, standard deviation, variance.

UNIT - V

Meaning of probability, random experiment an outcome, sample space, sample point, types of sample space, types of events, and probability of an event, total and conditional probability, probability distribution of a random variable, repeated independent (Bernoulli) trials and binomial distribution.

References:

1. Basics of Mathematics By R. D Sharma.
2. Statistics and Solution By V. K. Kapoor.
3. www.e-booksdirectory.com/mathematics
4. www.origoeducation.com/go-maths

Fundamentals of Information Technology
(BCA102)

Course Objectives:

- To know computer evolution with features of each generation.
- Identify various devices used in Computer system with specific use of each.
- To know the place of computer in our day to day life, its characteristics, its usage, Limitations and benefits etc.
- To know types of software and languages with specific use of each.
- To understand Computer Network and Management Information System basics.
- To familiarize student with Office Automation and Component of Office Automation.
- To make them comfortable to evaluate, select and use Office Software appropriate to specific task.
- To make them work on Open Software for Office Automation.
- To develop expertise in Word Processing, Spreadsheet, and Presentation Skills.

Course Outcomes:

- Describe Computer System evolution, Characteristics and Types.
- Select Need base System Hardware and Software.
- Describe the OS, Types of OS, Batch File and features.
- Describe the Use, Process, Types and Topologies of Computer Communication.
- Outline Office Suit components with specific application.List Open Office Software.
- Apply Word Processing Tools including Document Formatting, Using Graphics, Working with Macro and Mail Merge.
- Apply Spread Sheet Tools including Worksheet formatting, Using Functions, Graphics and Charts.
- Create effective Presentation Using Animation and Transition.

UNIT - I

Introduction to Computers: Introduction, Characteristics of Computers, Block diagram of computer. Types of computers and features, Mini Computers, Micro Computers, Mainframe Computers, Super Computers. Types of Programming Languages (Machine Languages, Assembly Languages, High Level Languages). Data Organization, Drives, Files, Directories. Types of Memory (Primary And Secondary) RAM, ROM, PROM, EPROM. Secondary Storage Devices (FD, CD, HD, Pen drive)I/O Devices (Scanners, Plotters, LCD, Plasma Display) Number Systems Introduction to Binary, Octal, Hexadecimal system Conversion.

UNIT - II

Operating System and Services in O.S. Dos – History, Files and Directories, Internal and External Commands, Batch Files, Types of O.S.Windows Operating Environment Features of MS – Windows, Control Panel, Taskbar, Desktop, Windows Application, Icons, Windows Accessories, Notepad, Paintbrush etc.Use of communication and IT, Communication Process, Communication types- Simplex, HalfDuplex, Full Duplex, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication,

Modem - Working and characteristics, Types of network Connections - Dialup, Leased Lines, ISDN, DSL, RF, Broad band, Types of Network - LAN, WAN, MAN, Internet, VPN etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Components of LAN -Media, NIC, NOS, Bridges, HUB, Routers, Repeater and Gateways.

UNIT - III

Introduction to Office Automation Suit, Elements of Office Suit & Area of Use. WordProcessing, Spreadsheet, Presentation Graphics, Database. Introduction of various Office Suites Open Office, Libre Office, WPS Office, Microsoft Office. Word Basics Using MSOffice : Starting Word Processor, The parts of a Word Processor Window, Menus & Commands, Toolbars & Buttons, Shortcut Menus, Creating a New Document, Different Page Views and Layouts, Applying various Text Enhancements, Formatting Text and Documents:Auto Format, Text Attributes, Paragraph and Page Formatting, Line Spacing, Margins, Borders and Shading, Tabs and Indents, Text Editing using various features, Bullets, Numbering, Working with Styles, Printing & various print options, Spell Check ,Working with Headersand Footers, Tables: Creating a Simple Table, Creating a Table using the Table Menu, Entering and Editing Text in a Table, Selecting in Table, Adding Rows, Changing Row Heights, Deleting Rows, Inserting Columns, Deleting Columns, Changing Column Width.

UNIT – IV

Spreadsheet Basics: Overview of Spreadsheet, Features, Creating a New Worksheet, Selecting Cells, Entering and Editing Text, Entering and Editing Numbers, Entering and Editing Formulas, Referencing Cells, Moving Cells, Copying Cells, Sorting Cell Data, Inserting Rows,Columns, Inserting Cells, Deleting Parts of a Worksheet, Clearing Parts of a Worksheet. Formatting: Page Setup, Changing Column Widths and Row Heights, Auto Format, Changing Font Sizes and Attributes, Using Border Buttons and Commands, Changing Colors andShading, Hiding Rows and Columns.Function in Spreadsheet, Functions by category: Date and Time functions, Statistical functions, Text functions. Spreadsheet Charts: Chart parts and Terminology, Instant Charts with the Chart Wizard, Creation of different types of Charts, Printing Charts, Deleting Charts, L:inking in Spreadsheet. Spreadsheet Graphics: Creating and Placing Graphic Objects, Resizing Graphics, Drawing Lines and Shapes.

UNIT - V

Creating Presentations: Using Blank Presentation Option, Using Design Template , Adding Slides, Deleting a Slide, Importing Images from Outside, Transition and Build Effects, Deleting a Slide, Numbering a Slide, Saving Presentation, Closing Presentation, Printing Presentation.

Reference:

- Pradeep K Sinha, Priti Sinha, Computer Fundmentals, Sixth Edn. BPB Publications
- S.K.Basandra, "Computers Today ", Galgotia Publications.
- Alexis Leon & Mathews Leon, "Fundamentals of Information technology ", Vikas Publishing House, New Delhi.
- V.Rajaraman, NeeharikaAdabala, Computer Fundamentals, PHI
- Microsoft Office Ste by Step Beth Melton,Mark Dodge , Published with the authorization of Microsoft Corporation by: O'Reilly Media.
- Office 2013 Bible: The Comprehensive Tutorial Resource Paperback – by Lisa A. Bucki (Author), John Walkenbach (Author), Michael Alexander.

- Learning Microsoft Office 2013 by Ramesh Bangia, Khanna Publishers
- www.openoffice.org/documentation/manuals/.../0100GS3- GettingStartedOOo3.pdf
- Open Office for Dummies (https://whc.es/OpenOffice%20org%20For%20Dummies.pdf)
- https://www.libreoffice.org/get-help/documentation/Libre Office 5.1 Writer, Calc, Math Formula Book- Vol 1 by Lalitmali

Programming for Problem Solving Using 'C and C++'
(BCA103)

Course Objectives:

- Have Understanding of Programming Language Standards, Problem Solving Techniques, IDE and Compilers for C and C++.
- To have in depth knowledge of Writing, Compiling and Running Programs.
- To understand and Practice Programming Construct: Variable, Operators, Control Structures, Loop, Functions with C and C++.
- To understand and Practice basics of arrays, pointers, preprocessor, Structure and Union
- To learn difference in procedural and Object oriented programming language with understanding of OOPs features and Practice beginner level of Pointers, Preprocessor, Programming

Course Outcomes:

- List and Demonstrate Basic Terminology Used in Computer Programming Write, Compile and Debug Programs in C and C++ Language.
- Understand and Apply Variable, Conditional Statements, Loops, Functions in C and C++.
- Practice Pointers, Structure, Union and Class in Programming.
- Explain and Differentiate the Process of Problem Solving Using Procedural and Object Oriented Programming Language.
- Understand and Practice Object Oriented Programming Concepts in C++

UNIT-I

Idea of Algorithm: Representation of Algorithm, Flowchart, Pseudo code with examples, From algorithms to programs, source code. Introduction to C Language, Language Standards, Features of Procedural Language specific to C, Structure of C and C++ Program, Introduction to Compilers, Creating, Compiling and Executing C and C++ Programs, IDE Features of Turbo Compiler. Keywords , Identifiers, Variables, Constants, Scope and Life of Variables, Local and Global Variable, Data Types, Expressions. Operators - Arithmetic, Logical, Relational, Conditional and Bit Wise Operators, Precedence and Associativity of Operators, Type Conversion. Library Function, Character Input/Output- getch( ), getchar( ). getche( ), putchar( ). Formatted Input/Output-printf( ) and scanf( ), Mathematical & Character Functions in C and C++.

UNIT- II

Control Structures: Declaration Statement, Conditional Statement - if Statement, if-else Statement, Nesting of if Statement, else if Ladder, The?: Operator, switch Statement. Iteration Statements - For Loop, While Loop, Do-While Loop. Jump Statements: break, continue, goto,exit( ). Arrays - Concept of Single and Multi-Dimensional Arrays, Array Declaration and Initialization. Strings: Declaration, Initialization, String Functions Using C and C++.

UNIT- III

The Need of Functions, User Defined and Library Function, Prototype of Functions, Prototype of main( ) Function, Calling of Functions, Function Arguments, Argument Passing: Call By Value and Call By Reference, Return Values. Nesting of Function, Recursion, Array asFunction Argument, Command Line Arguments, Basics of Pointers, Pointers Operators, Pointer Arithmetic, Pointers and Function, Pointer and Strings. Preprocessor and its Advantages.

UNIT- IV

Storage Class Specifier- Auto, Extern, Static, Register. Defining Structure, Declaration of Structure Variable, Type def, Accessing Structure Members, Member Access Operator, Nested Structures, Array of Structure, Structure Assignment, Structure as Function Argument, Function that Return Structure, Union. Pointer to Structure, Pointers within Structure, Introduction to Static and Dynamic Memory Allocation, The Process of Dynamic Memory Allocation, DMA Functions : malloc( ), calloc( ), free( ), realloc( ), sizeof( ) Operator. C++Classes and Object.

UNIT- V

Constructor and its Types, Array of Objects, Object as Argument, Reference Variable, Default Argument, Destructor Function, Object Oriented Programming Concepts. Polymorphism (Operator Overloading, Function Overloading) . Inheritance and its Types. Access Specifier, Virtual Functions, Abstract Base Classes and Pure Virtual Function. Virtual Base Classes.

References:

- Kerninghan& Ritchie "The C Programming Language", PHI
- Schildt "C:the Complete Reference", 4th Ed TMH.
- Kanetkar Y. "Let Us C", BPB.
- Kanetkar Y.: "Pointers in C",BPB
- Gottfried : "Problem Solving in C", Schaum Series
- Balagurusami "Programming in ANSI C",7thed McGraw Hill Education.
- Herbertz Shield, "C++ The Complete Reference "TMH Publication ISBN 0-07-463880-7
- R. Subburaj, 'Object Oriented Programming WithC++ Vikas Publishing House, New Delhi.Isbn 81-259-1450-1
- E. BalgurUswamy, "C++ " TMH Publication ISBN O-07-462038-X
- M. Kumar 'Programming InC++" TMH Publications
- R. Lafore, 'Object Oriented Programming C++"
- Ashok. N. Kamthane, "Object Oriented Programming WithANSi& Turbo C++ ", Pearson Education Publication,ISBN-8j-7808-772-3

Environmental Studies

(BCA104A)

Unit 1 : Introduction to Environmental Studies   **(6 Lecture)**

- Multidisciplinary nature of environmental studies;
- Scope and importance; Concept of sustainability and sustainable development.

Ecosystems

- What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems :
  a) Forest ecosystem
  b) Grassland ecosystem
  c) Desert ecosystem
  d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 2 : Natural Resources : Renewable and Non---renewable Resources   **(6 Lecture)**

- Land resources and landuse change; Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water : Use and over---exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter---state).
- Energy resources : Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Unit 3 : Biodiversity and Conservation   **(5 Lecture)**

- Levels of biological diversity : genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots
- India as a mega---biodiversity nation; Endangered and endemic species of India
- Threats to biodiversity : Habitat loss, poaching of wildlife, man---wildlife conflicts, biological invasions; Conservation of biodiversity : In---situ and Ex---situ conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

Unit 4 : Environmental Pollution   **(9 Lecture)**

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

Environmental Policies & Practices

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
- Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).
- Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

Unit 5 : Human Communities and the Environment   (4 Lecture)

- Human population growth: Impacts on environment, human health and welfare.

- Resettlement and rehabilitation of project affected persons; case studies.

- Disaster management : floods, earthquake, cyclones and landslides.

- Environmental movements : Chipko, Silent valley, Bishnois of Rajasthan.

- Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.

- Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

Suggested Readings:

1. Carson, R. 2002. *Silent Spring*. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R.1993. *This Fissured Land: An Ecological History of India*. Univ. of California Press.
3. Gleeson, B. and Low, N. (eds.) 1999.*Global Ethics and Environment*, London, Routledge.

4. Gleick, P. H. 1993. *Water in Crisis*. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.

5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll.*Principles of Conservation Biology*. Sunderland: Sinauer Associates, 2006.

6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. *Science,* 339: 36---37.
7. McCully, P. 1996. *Rivers no more: the environmental effects of dams*(pp. 29---64). Zed Books.

8. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.

9. Odum, E.P., Odum, H.T. & Andrews, J. 1971.*Fundamentals of Ecology*. Philadelphia: Saunders.
10. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.
11. Rao, M.N. & Datta, A.K. 1987. *Waste Water Treatment*. Oxford and IBH Publishing Co. Pvt. Ltd.
12. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012.*Environment*. 8th edition. John Wiley & Sons.
13. Rosencranz, A., Divan, S., & Noble, M. L. 2001. *Environmental law and policy in India. Tripathi 1992*.
14. Sengupta, R. 2003. *Ecology and economics*: An approach to sustainable development. OUP.

15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. *Ecology, Environmental Science and Conservation*. S. Chand Publishing, New Delhi.

16. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. *Conservation Biology*: *Voices from the Tropics*. John Wiley & Sons.

17. Thapar, V. 1998. *Land of the Tiger*: *A Natural History of the Indian Subcontinent*.
18. Warren, C. E. 1971. *Biology and Water Pollution Control*. WB Saunders.
19. Wilson, E. O. 2006.*The Creation: An appeal to save life on earth*. New York: Norton.

20. World Commission on Environment and Development. 1987.*Our Common Future*. Oxford University Press.

Digital Electronics

(BCA105)

Digital Electronics

COURSE OBJECTIVE:

1. Understanding the disciplines of analog and digital electronic logic circuits.
2. Various Number system and Boolean algebra then design and implementation of combinational circuits.
3. Design and implementation of Sequential circuits, Hardware description language.

 COURSE OUTCOME:

1. Understand the concepts of various components to design stable analog circuits.
2. Represent numbers and perform arithmetic operations.
3. Minimize the Boolean expression using Boolean algebra and design it using logic gates.
4. Analyze and design combinational circuit.
5. Design and develop sequential circuits.
6. Translate real world problems into digital logic formulations using VHDL.

UNIT-I

Boolean Algebra : Basics Laws of Boolean Algebra, Logic Gates, Simplifications of Boolean equations using K-maps, Code Conversion, (Binary, Octal, Hexadecimal), Overview of Gray codes and Excess – 3 codes.

UNIT-II

Arithmetic Circuits Adder, Subtractor, Parallel binary adder/Subtractor, binary multiplier and divider. Combinational Circuits Multiplexers, De-Multiplexers, decoders, encoders, Design of code converters.

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.

UNIT-IV

Counters- Ripple counter, Synchronous Counter, Modulo Counters, Ring Counter, Twisted Ring Counter. Memory Devices - RAM, ROM, PAL & PLA

Text Books:

1. Moris Mano, "Digital Logic and Computer Design", PHI Publications, 2002
2. R. P. Jain, "Modern Digital Electronics", TMH, 3rd Edition, 2003.

References Books :

1. R.L.Tokheim, "Digital Electronics, Principles and Applications", Tata McGraw Hill, 1999.
2. W.Gothman, "Digital electronics", PHI.
3. S. Salivahanan & S. Arivyhgan. "Digital circuits and design", Vikas Publication, 2001
4. Malvino Leach, "Digital Principles and Application", TMH, 1999.

Fundamentals of Information Technology and Office Automation Lab (BCA106P)

Practical will be based on Paper Fundamentals of Information Technology and Office Automation Lab: Covers UNIT-III, UNIT-IV, and UNIT-V, of Syllabus.

Programming for Problem Solving Using 'C and C++' Lab (BCA107P)

1. Write a Program in C to calculate Simple Interest when the values of Principal, Rate and Time are given.
2. Write a Program in C++ to calculate Temperature in Centigrade when temperature is in Fahrenheit.
3. Write a Program in C to determine whether an input Year is Leap Year or not.
4. Write a program to calculate the Factorial of a number input from Keyboard using Recursive method.
5. Write a Program in C++ to show how to pass an Array to a user defined function.
6. Write a Program in C to swap two numbers using Call by Value and Call by Address.
7. Write a Program in C to read Name, Roll No, and Percentage of five Students and display them using Array of Structures.
8. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by the user. Assign grades according to the following criteria :
   a. Grade A: Percentage >=80
   b. Grade B: Percentage>=70 and <80
   c. Grade C: Percentage>=60 and <70
   d. Grade D: Percentage>=40 and <60
   e. Grade E: Percentage<40
9. Write a Program in C++ to display the first n terms of Fibonacci series.
10. Write a Program in C to calculate the sum of two compatible matrices.
11. Write a Program in C++ to calculate the product of two compatible matrices.
12. Write a C program to pass an entire array to a user-defined function and multiply each element by 3 inside the function and print the elements of the array in main().
13. Write a C program to show usage of pointer to structure using arrow operators
14. Write a C program to show usage of pointer to function
15. Raising a number n to a power p is the same as multiplying n by itself p times. Write a function called power ( ) that takes a double value for n and an int value for p, and returns the result as double value. Use a default argument of 2 for p, so that if this argument is omitted, the number will be squared. Write a main ( ) function that gets values from the user to test this function.
16. Create a class Employee with basic information of Employees as data members and member function to get these information and display employee information.

SEMESTER – II

Statistical Methods
(BCA201)

Course Objectives: To understand the role of statistic and probability in the spatial data analysis and design

Course Outcomes:

at the end of the course the student will able to learn to Understand/(Solve the problems using) the advanced statistical approaches, Identify the statistical methods for solving geospatial problems, apply the advanced statistical methods for image processing and to use geo-statistics for studying spatially varying phenomena

UNIT-I

Basic Statistics:Sources of Data, Organization of Data, The Histogram, Measures of central tendency, Mean Deviation, Standard Deviation, Correlation, Coefficient of correlation, Rank correlation, Regression.

UNIT-II

Probability:equally likely, mutually exclusive events, definitions of probability, additions & multiplication theorems of probability and problems based on them. Bayesian approach, distributions; Poisson, normal, Erlang, Gamma and Weibull probability distributions

UNIT-III

Multivariate Data:Random Vectors and Matrices, sample estimate of centroid, standard deviation, SSCP, dispersion, variance, covariance, correlation matrices.

UNIT-IV

Multivariate Regression Models, Multiple linear Regression:Multiple parameter estimation by method of least squares, tests of significance use of dummy variables, problems associated with multi collinearity, heteroscedasticity.

UNIT-V

Geo-statistics-Pattern Analysis, Measures of Arrangements & dispersion, Auto Correlation, Semi-veriogram, Kriging;

TEXT BOOKS:

- Gupta, S.C. and Kapoor, V.K., "Fundamentals of Mathematics Statistics", Sultan Chand and Sons, 2001.
- Johnson, R.J., "Miller and Freund's Probability and Statistics for Engineers" 6th Edition, Prentice Hall of India, 2002.

REFERENCES:

- Jay L. Devore, "Probability and statistics for Engineering and the Sciences", Thomson and Duxbbury, 2002.

- Sarma, D.D. "Geostatistics with Applications in Earth Sciences", Capital Publishing Company, 2002.
- Cooley W. W and LohnesP.R .- Multivariate Data Analysis, John Wiley and Sons,1971.

Data Structures Using C++

(BCA202)

Course Objectives:

- To learn Several data structure concepts like stack, queue, linked list, trees and graphs
- To learn the Applications of data structures.
- To improve the Problem solving quality using data structure techniques

Course Outcomes:

- Understand the concept and usage of data types, dynamic memory management and data structures.
- Implement stack and queues algorithms
- Implement linked list data structures
- Implement graphs data structures
- Implement tree and sorting in data structures
- Choose the appropriate data structures to solve complex real life problems

UNIT I - INTRODUCTION TO DATA STRUCTURES

Definition – types of data structure-abstract data type-array as an abstract data type representation of array- sparse matrices- asymptotic notation.

UNIT II - STACKS AND QUEUES

Stacks- queue- mazing problem- evaluation of expression- postfix notation- infix to post fix- multiple stack and queue.

UNIT III - LINKED LIST

Singly linked list- representation of linked singly list- operations on singly linked list, doubly linked list- representation of doubly linked list- operations on doubly linked listdifferentiate singly and doubly linked list- circularly singly and doubly linked list

UNIT IV - TREES

Tree Terminology- representation of tree- binary tree- binary tree traversaloperations on tree- applications- Sorting: selection sort- bubble sort- quick sort

UNIT V - GRAPHS

Definition- representation of a graph- operations- breadth first search- depth first search- minimum cost spanning trees- kruskal's algorithm and prim's algorithmshortest path and transitive closure- single source- floyds algorithm- all pair dijikstra's algorithm.

TEXT BOOK

- Ellis Horowitz, Sahni, Dinesh Mehta (1999), "Fundamentals of Data Structures in C++", Golgotha publication, New Delhi.

REFERENCE

- Weiss Mark Allen (2006), "Data Structure and algorithm analysis", Pearson Education.

Data Structures Using C++ Lab
(BCA206P)

Practical List on Data Structures Using C++

1. Program to maintain a Linked List.
2. Program to add a new node to the ascending order Linked List.
3. Program to maintain a Doubly Linked List.
4. Program to implement Stack as an Array.
5. Program to implement Stack as a Linked List.
6. Program to convert an A.E. from Infix form to postfix form.
7. Program to evaluate an Expression entered in Postfix form.
8. Program to Implement Non-Recursive function for Factorial of a Number.
9. Program to Implement Recursive function for Factorial of a Number.
10. Program to implement a Queue as an Array.
11. Program to implement a Queue as a Linked List.
12. Program to implement a Circular Queue as an Array.
13. Program to implement a Circular Queue as a Linked List.
14. Program to implement a Deque using an Array.
15. Program to implement Linear Search in an unsorted Array.
16. Program to implement Binary Search in a sorted Array.
17. Program to implement Selection Sort.
18. Program to implement Insertion Sort (The program should report the number of Comparisons).
19. Program to implement Bubble Sort.
20. Program to implement Quick Sort.

Database Management System

(BCA203)

Course Objectives:

- To understand need of DBMS.
- To understand conceptual and physical design of a database.
- To understand RDBMS and to design Relational database.
- To know basic database backup and recovery mechanism.
- To know advances in DBMS.

Course Outcomes:

- Understand Data, Database system and its architecture.
- Apply ER modeling and Relational Database design using Normalization.
- Apply concepts of database storage and querying.
- Understand Concurrency, Recovery and Security mechanism in DBMS.
- Understand Current advances in DBMS.

UNIT - I

Introduction To Database System : Data - Database Applications - Evolution of DB & DBMS - Need for data management, Introduction and applications of DBMS, File systems versus Database systems, Data Models, DBMS Architecture, Data Independence, Data Modelingusing Entity-Relationship Model, Enhanced ER Modeling.

UNIT - II

Relational Database Concept and Design: Introduction to relational database, Structure of Relational Database, Relational model terminology domains, Attributes, Tuples, Relations, relational DB schema. Relational algebra: Basic operations selection and projection, Set Theoretic operations Union, Intersection, set difference and division, Join operations: Inner, Outer, Left outer, Right outer and full outer join. Relational Database design, Functional Dependency, definition, trivial and nontrivial FD, Normalization 1Nf, 2NF, 3NF, Decomposition using FD dependency preservation, BCNF, Multi valued dependency, 4NF, Join dependency and 5NF.

UNIT - III

Database storage and querying -Basic Concepts of Indexing and Hashing Query Processing, Measures Of Query Cost, Query Processing for Select, Sort Join Operations, Basics of Query Optimization, Transformation of Relational Expression Estimating Statistics of Expression, Choice of Evaluation Plan.

UNIT - IV

Concurrency, Recovery and Security -Concurrency Control: Definition of concurrency, lost update, dirty read and incorrect summary problems due to concurrency. Concurrency Control Techniques: Overview of Locking, 2PL, Timestamp ordering, multi-versioning, validation

Recovery concepts, Shadow paging, Log Based Recovery, Elementary concepts of Database security: system failure, Backup and Recovery Techniques, authorization and authentication.

UNIT - V

Introduction to Current Trends – Centralized and Client Server Architectures, Distributed Databases, Object Oriented Database, Spatial & Temporal Databases, Data Mining & Warehousing, Data Visualization, Mobile Databases, OODB & XML Databases, Multimedia& Web Databases.

References:

- Abraham Silberschatz, Henry Korth, S. Sudarshan, "Database Systems Concepts", 7th Edition, McGraw Hill .
- Rajesh Narang "Database management System" PHI.
- Ramakrishnan and Gherke, "Database Management Systems", TMH.
- R. Elmarsi and SB Navathe, "Fundamentals of Database Systems", Pearson,5th Ed.
- Singh S.K., "Database System Concepts, design and application", Pearson Education
- Bipin Desai, "An Introduction to database Systems", Galgotia Publications

Financial Accounting
(BCA204)

Course Objectives:

This course revisits and strengthens fundamental accounting principles and processes, culminating in the preparation of the financial statements of a sole proprietorship business. The course also focuses on accounting for special transactions such as consignment and joint ventures.

Course Outcome:

1. Upon Understand and apply fundamental accounting concepts, principles and conventions.
2. Record basic accounting transactions and prepare annual financial statements for a sole proprietorship business.
3. Record accounting transactions for Bills of Exchange, Consignment Account, Joint Venture Account, Final Account.

UNIT-I

Overview - Meaning and Nature of Financial Accounting, Scope of Financial Accounting, Financial Accounting & Management Accounting, Accounting concepts & convention, accounting standards in India.

UNIT-II

Basics of accounting – Capital & Revenue items, Application of Computer in Accounting Double Entry System, Introduction to Journal, Ledger and Procedure for Recording and Posting, Introduction to Trail Balance, Preparation of Final Account, Profit & Loss Account and related concepts, Balance Sheet and related concept.

UNIT-III

Financial statement analysis: Ratio analysis, Funds flow analysis, concepts, uses, Preparation of funds flow statement, simple problem, Cash flow analysis, Concepts, uses, preparation of cash flow statement, simple problem, Break – even analysis.

UNIT-IV

Definition nature and Objective of Financial Management, Long Term Sources of Finance, Introductory idea about capitalization, Capital Structure, Concept of Cost of Capital, introduction, importance, explicit & implicit cost, Measurement of cost of capital, cost of debt.

UNIT-V

Concept & Components of working Capital. Factors Influencing the Composition of working Capital, Objectives of working Capital Management – Liquidity Vs. Profitability and working capital policies. Theory of working capital: Nature and concepts, Cash Management, Inventory Management and Receivables Management.

Referential Books:

- Maheshwari&Maheshwari, "An Introduction to Accountancy", 8th Edition, Vikas Publishing House, 2003
- Gupta R.L., Gupta V.K., "Principles & Practice of Accountancy", Sultan Chand & Sons, 1999.
- Khan & Jain, "Financial Accounting"
- Maheshwari S.N., "Principles of Management Accounting", 11th Edition, Sultan Chand & Sons, 2001.
- Shukla and Grewal, "Advanced Accounts", 14th Edition, Sultan Chand & Sons.

English
(BCA205A)

Course Objective

The purpose of this course is to introduce students to the theory, fundamentals and tools of communication and to develop in them vital communication skills which should be integral to personal, social and professional interactions. One of the critical links among human beings and an important thread that binds society together is the ability to share thoughts, emotions and ideas through various means of communication: both verbal and non-verbal. In the context of rapid globalization and increasing recognition of social and cultural pluralities, the significance of clear and effective communication has substantially enhanced.

CONTENTS

Unit I: Introduction: 06

Theory of Communication, Types and modes of Communication, Mediums and channels of communication, barriers to communication, English as a Global language, the Lingua Franca, Social influences on English

Unit II: Language of Communication:
     08

Verbal and Non-verbal (Spoken and Written) Personal, Social and Business Barriers and Strategies Intra-personal, Inter-personal and Group communication, Varieties of English, Language, Accent, Dialect, Colloquialism, Historical influences on English

Unit III: Speaking Skills: 06

Monologue Dialogue Group Discussion Effective Communication/ Mis- Communication Interview Public Speech, Regional influences on English, Convergence and divergence, Linguistic Imperialism,

Unit IV: Reading and Understanding-   06

Close Reading, Reading analysis of a text - Audience and purpose, Content and theme, Tone and Mood, stylistic devices, structure Comprehension- Analysis and Interpretation Translation(from Indian language to English and vice-versa) Literary/Knowledge Texts

Unit V: Writing Skills   06

Documenting Report Writing Making notes Letter writing, Writing tabloids, diary entry, open letters, essays, newsletter and magazine articles, skits, short stories, impersonating characters

Course outcome:

It will enhance Language of communication, various speaking skills such as personal communication, social interactions and communication in professional situations such as interviews, group discussions and office environments, important reading skills as well as

writing skills such as report writing, notetaking etc. While, to an extent, the art of communication is natural to all living beings, intoday's world of complexities, it has also acquired some elements of science. It is hoped that after studying this course, students will find a difference in their personal and professional interactions.

Recommended Readings:

1. Fluency in English - Part II, Oxford University Press, 2006.

2. Business English, Pearson, 2008.

3. Language, Literature and Creativity, Orient Blackswan, 2013.

4. Language through Literature (forthcoming) ed. Dr. Gauri Mishra, DrRanjanaKaul, DrBrati Biswas

Practical List on DBMS
(BCA207P)

1. Draw an ER diagram to University Database.
2. Draw an ER diagram to Library management System.
3. Create a Library management Schema/ database and search anomalies in it.
4. Assume a video library maintains a database of movies rented out. Without any normalization, all information is stored in one table as shown below.
   a. Normalize the following Schema with given Constraints.
   b. books(accessionno, isbn, title, author, publisher)
   c. users(userid,name, deptid, deptname)
   d. accessionno ->isbn
   e. isbn -> title
   f. isbn -> publisher
   g. isbn ->title
   h. userid -> name,
   i. userid ->deptid
   j. deptid -> department

5. Compare 3NF and BCNF with appropriate example.
6. Give exercise on DDL and DML .
7. Create a database named "school.mdb" and perform the following tasks using MS Access or My SQL
8. Create a table named "studentinfo" having following table structure.

Field Name	Data Type	Structure
Class	Number	
Section	Text	
Roll No.	Number	
Name	Text	40 Characters Long
Status	LookUp Wizard	Two Value: Senior and Junior
Photo	OLE Object	Photos of Student
DOB	Date/Time	Date of Birth Of students
Remarks	Memo	

9. Fill atleast 5 records.

   Prepare a query to display all records and Name should be in ascending order.
   Prepare a query named "senior" to display records including fields name, class, sec, rollno, status, photo and value of "status" field must be senior.
   Prepare a form of above query "senior". Prepare a report of all the fields of above table.

10. Create a database named "library.mdb" and perform the following tasks:

11. Create a table named "Book" having following structure:

Field Name	Data Type
Bookid	Text
BName	Text
WName	Text
PYear	Date/Time
PName	Text
Price	Currency

Add at least 5 records.

SEMESTER – III

Programming in Java
(BCA301)

Course Objectives:

- Understand the usage of Java SDK environment and apply to create, debug and run simple java programs.
- Understand and apply the basic concept of java programming such as character set, variables, data types, conditional and iterative execution, methods, etc.
- Understand and implement the Object-Oriented Programming (OOPs) concepts in java, through defining classes, invoking methods, using class libraries, etc.
- Learn the creation and the usage of arrays and threads in java.
- Learn and demonstrate java applets.

Course Outcomes

- Explain the object oriented concepts and apply them for solving real problems.
- Demonstrate and apply the various features Java SDK to develop, run and debug java programs.
- Apply java technology to develop the small applications, utilities, and web applications.
- Apply events management and layout managers using awt, swing, jdbc and servlet for developing the software for various problems.

UNIT-I

C++ vs java, java and internet and WWW, java support systems, java environment, java program structure, tokens, statements, java virtual machine, constants & variables, data types, type casting, operators, expressions & its evaluation, decision making and branching, loops,jumps in loops, labeled loops.

UNIT-II

Defining a class, adding variables and methods, creating objects, accessing class members, constructors, method overloading, static members, nesting of methods, inheritance: extending a class, overriding methods, final variables and method~, final classes, finalizes methods, abstract methods and classes, visibility control.

UNIT-III

Arrays, one dimensional & two dimensional, strings, vectors, wrapper classes, defining interfaces, extending interfaces, implementing interfaces, accessing interface variables, system packages, using system packages, naming conventions, creating packages, accessing apackage, using package, adding a class to a package, hiding classes.

UNIT-IV

Threads, creating threads, extending the threads class, stopping and blocking a thread, life cycle of a thread, using thread methods, thread exceptions, thread priority, synchronization, implementing the unable interface.

UNIT-V

Applets, local and remote applets, applets VS applications, writing applets, applets life cycle, creating an executable applet, designing a web page, applet tag, adding applet to HTML file, running the applet, passing parameters to applets, aligning the display, HTML tags & applets, getting input from the user interface.

References:

- E. Balagurusamy, "Programming with Java, a Primer",TMH, ISBN-13: 978-0-07-061713-1, ISBN-10: 0-07-061713-9.
- Patrick Naughton and Herbert Schildt, "Java: the Complete Reference", TMH Publication, ISBN 0-07-463769-X.
- Yashavantkanetkar, "Let us Java", BPB Publications.
- Cay Horstmann, "Big Java", Wiley Publication
- Peter Norton, "Java Programming", Techmedia Publications.
- Joseph Weber, "Using Java 1.2", PHI, ISBN -81-203-1558-8.

Practical List on Programming in JAVA
(BCA306P)

1. Write a program to find the largest of n natural numbers.
2. Write a program to find whether a given number is prime or not.
3. Write a menu driven program for following:
    a. Compute Factorial of a number
    b. Check whether a given number is odd or even.
    c. Check whether a given string is Palindrome or not.
4. Write a program to print the sum and product of digits of an Integer and reverse the Integer.
5. Write a program to create an array of 10 integers. Accept values from the user in that array.Input another number from the user and find out how many numbers are equal to thenumber passed, how many are greater and how many are less than the number passed.
6. Write a program that will prompt the user for a list of 5 prices. Compute the average ofthe prices and find out all the prices that are higher than the calculated average.
7. Write a program in java to input N numbers in an array and print out the Armstrongnumbers from the set.
8. Write java program for the following matrix operations:
    a. Addition of two matrices
    b. Multiplication of two matrices
    c. Input the elements of matrices from user.
9. Write a java program that computes the area of a circle, rectangle and a triangle usingfunction overloading.
10. Write a Java for the implementation of Multiple inheritance using interfaces to calculatethe area of a rectangle and triangle.
11. Write a java program to create a frame window in an Applet. Display your name, addressand qualification in the frame window.
12. Write a java program to draw a line between two coordinates in a window.
13. Write a java program to display the following graphics in an applet window.
    a. Rectangles
    b. Circles
    c. Ellipses
    d. Arcs
    e. Polygons
14. Write a program for the following string operations:
    a. Compare two strings
    b. Concatenate two strings
    c. Compute length of a string
15. Create a class called Fraction that can be used to represent the ratio of two integers. Includeappropriate constructors and methods. If the denominator becomes zero, throw and handlean exception.
16. Write a program to Display Fibonacci series.

Web Development with PHP

(BCA302)

Course Objective:

This course is aimed to provide a fundamental understanding of dynamic web site creation. PHP is the language used for development of most common web sites. Syllabus includes basic and advancedfeatures of PHP which includes detailed introduction of PHP and MYSQL, Arrays, Loops andvariables etc. It also gives an overview open source framework like JOOMLA, ZEND etc.

Course Outcomes:

- Develop programs using HTML and PHP.
- Develop PHP Program using Character set, variables, data types, conditional and iterative statements, functions etc.
- Develop WebPages using built-in functions related to string manipulation, mathematical, date and time etc.
- Develop Web pages using Arrays, Web forms, files, and databases with PHP

UNIT - I Introduction to HTML

HTML INTRODUCTION: History of HTML – HTML Document – Anchor Tags – Hyper Links-Sample HTML Documents.HEAD AND BODY SECTIONS: Header Section – Title – Prologue – Links – Comment – Heading – Horizontal Rule – Paragraph – Images and Pictures - Ordered and Unordered List.TABLES: Table Creation – ColSpan, RowSpan – Cell Spacing, Cell Padding – Nested Tables. FRAMES: Frameset Definition – Frame Definition – Nested Frames.FORMS: Action Attribute – Method Attribute – Drop Down List – Sample Forms.

UNIT - II Introduction to Open Source and PHP programming

Introduction to Open Sources Technologies, Introduction to PHP, installation and configuration, Advantages and Disadvantages of PHP, Client Side Scripting, Server Side Scripting, Variables, data types, various types of function, creating your own function, Strings in PHP, String Functions.Operator, Loops, Array, Exception and Error Handling Operators, Conditions, Loops, Using for each, Creating and Using Arrays, Multidimensional Array, Associative array. Error Handling in PHP, Errors and Exceptions, Exception class, try/catch block, throwing an exception, defining your own Exception subclass.

UNIT - III

Classes, File system, Passing Information between pages Object oriented programming with PHP, Working with Date time, code re-use, require (), include(), and the include path; Understanding PHP file permissions, File reading and writing functions, File system functions, File uploads, Sending mail & use of email server. HTTP, GET arguments, POST arguments, Using Session in PHP, cookies, The setcookie() function, Deleting Cookies and Reading Cookies.

UNIT - IV Working with Database

HTML Tables and Database tables, Databasemanipulation(Select, Insert, Update, Delete), validating User Input usingJavascript.MYSQL, Introducing MySQL; database design concepts; the Structured Query, Language (SQL); communicating with a MySQL backend via the PHP, MySQL API Building Database Applications.

UNIT - V Working with Frameworks

Working with Mambo, Working with Joomla, Working with framework.Use of Joomla in rapid development of website.Developing of simple website using joomla.

References/Text Books:

- Beginning PHP, Apache, MySQL Web Development
- Michael K. Glass, Yann Le Scouarnec, Elizabeth Naramore, Gary Mailer, Jeremy Stolz, Jason Gerner
- PHP Manual.
- The Complete Reference PHP, by Steven Holzner, TAYA McGraw-Hill Publication
- Beginning PHP and MYSQL, by W. Jason Gilmore, Apress Publication

Practical List on Web Development with PHP-Lab (BCA307P)

1. Write the process of installation of web server.
2. Write programs to print all details of your php server. Use phpinfo().
3. Write a program to give demo of ECHO and PRINT command.
4. Write a program to implement the string functions.
5. Write a program to print Fibonacci series upto given number.
6. Write a menu driven program to implement a calculator which performs only addition, subtraction, multiplication and division. The operation should happen based on user choice.
7. Write a program sort ten number by using array.
8. Write a program to demonstrate the concept of associative array.
9. Write a program to demonstrate the concept of multidimensional array.
10. Write a program to demonstrate the concept of Classes & objects.
11. Create a login form with two text fields called "login" and "password". When user enters "Kalinga"as a user name and "University" as a password it should be redirected to a Welcome.HTML page or toSorry.HTML in case of wrong username/password.
12. Create a database in MySql and connect that database from PHP.
13. Write a program to Update, insert and delete the values of table in database.
14. Create a form with a text box asking to enter your favorite city with a submit button when the user enters the city and clicks the submit button another php page should be opened displaying "Welcome to the city".
15. Write a program to design login form in which find the greatest number amongst three numbers.
16. WAP for Marksheet generation

Design and Analysis of Algorithm
(BCA303)

Course Objective:

The designing of algorithm isan important component of computer science. The objective of this course is to make students aware of various techniques used to evaluate the efficiency of a particular algorithm. Students eventually should learn to design efficient algorithm for a particular program.

Course Outcomes:

- To learn a strong foundation about algorithms.
- To learn different techniques for writing algorithm.
- To apply the techniques for producing algorithm for different problems.

UNIT - I: Introduction

Algorithm Design paradigms - motivation, concept of algorithmic efficiency, run time analysis of algorithms, Asymptotic Notations. Recurrences- substitution method, recursion tree method, master method

UNIT - II: Divide and conquer

Structure of divide-and-conquer algorithms: examples; Binary search, quick sort, Merge sort, Strassen Multiplication; Analysis of divide and conquer run time recurrence relations. Greedy Method: Overview of the greedy paradigm examples of exact optimization solution (minimum cost spanning tree), Approximate solution (Knapsack problem), Single source shortest paths, traveling salesman

UNIT - III: Dynamic programming

Overview, difference between dynamic programming and divide and conquer, Applications: Shortest path in graph, chain Matrix multiplication, Traveling salesman Problem, longest Common sequence, knapsack problem

UNIT - IV: Graph searching and Traversal

Overview, Representation of graphs, strongly connected components, Traversal methods (depth first and breadth first search), Back tracking: Overview, 8-queen problem, and Knapsack problem, Brach and bound: LC searching Bounding, FIFO branch and bound, LC branch and bound application: 0/1 Knapsack problem, Traveling Salesman Problem

UNIT - V: Computational Complexity

Complexity measures, Polynomial Vs non-polynomial time complexity; NP-hard and NP-complete classes, examples.

References/Text Books:

- E. Horowitz, S. Sahni, and S. Rajsekaran, "Funadmentals of Computer Algorithms," Galgotia Publication
- T. H. Cormen, Leiserson, Rivest and Stein, "Introduction of Computer algorithm,"

- Sara Basse, A. V. Gelder, "Computer Algorithms," Addison W
- J.E Hopcroft, J.D Ullman, "Design and analysis of algorithms"
- D. E. Knuth, " The art of Computer Program

PRINCIPLES OF MANAGEMENT
(BCA304)

Course Objective:

- To enable the students to learn about increasing organizational effectiveness.
- To achieve optimum utilization of various resources.
- To have co-ordination between various department in the organization

Course Outcomes:

- Describe and discuss the evolution of management thinking.
- Describe and discuss the environment of management by completing case analyses and article reviews.
- Explain the importance of planning, organizing, leading and controlling.
- Give examples of realistic and practical applications of managerial concepts.

UNIT – I

Management: Meaning – Importance – Management and Administration-Levels of Management- Functions of management- Development Management thoughts – Contributions of F.W. Taylor- Henry Fayol and Elton Mayo.

UNIT – II

Planning: Nature- Characteristics and importance- - Purpose – Steps – Types – Merits and Demerits of planning – Decision making.

UNIT – III

Organizing: Nature – purpose- types of organization structure – use of staff units and committees –Power- Authority – Responsibility – Delegation -Centralization Vs Decentralization.

UNIT – IV

Directing : Elements and Principles of Direction –Characteristics-Functions of Leader-Leadership Styles - Characteristics of leaders and Management –Motivation– Characteristics-Theories of Motivation (Maslow need Hierarchy Theory, Herzberg theory).

UNIT – V

Controlling: meaning – Elements and significance – steps in control processEffective Control-Techniques of control. Coordinating: Need – principles – approaches to achieve effective co-ordination.

TEXT BOOKS:

- Gupta C.B. - Business Management, Sultan Chand & Sons, Revised Edition 2009
- Robbins S.R. - Management ,Prentice Hall-2012, 11th Edition

REFERENCE BOOKS:

- Harold Koontz And O'Donnel- Essentials of Management,McGrawHill-2009,
- DinkarPagare - Business Management, Sultan Chand & Sons-2008
- Tripathi P.C. and Reddy P.N - Principles of Management,TMH-2009, 4th Edition

Operating Systems

(BCA305)

Course Objectives:

- To understand the services provided by operating system
- To understand the working and organization of process and its scheduling and synchronization.
- To understand different approaches of memory management techniques.
- To understand the structure and organization of the file system.

Course Outcomes:

- Understand, identify and describe the services provided by operating systems.
- Understand and solve problems involving process control, mutual exclusion, synchronization and deadlock.
- Implement processor scheduling, synchronization and disk allocation algorithms for a given scenario.
- Understand different types of operating system.

UNIT-I

Operating Systems - Definitions, functions, Types of operating system - Multiprogramming, Batch, Time Sharing, Single user and Multiuser, components, Operating system Services, System Calls, programs, System structure.

UNIT –II

Process management - process concepts, process state & process control block, process scheduling, scheduling criteria, scheduling algorithms, multiple processor scheduling, realtime scheduling, threads.

UNIT –III

Critical section problem, semaphores, classical problem of synchronization,, deadlock characterizations, method for handling deadlocks, deadlock prevention, deadlock avoidance,deadlock detection, recovery from deadlock .

UNIT –IV

Memory management - logical versus physical address space, contiguous allocation, fixed partition, variable partition, swapping, paging, segmentation, virtual memory, demand paging, page replacement, page replacement algorithms

UNIT –V

Disk scheduling, disk management, swap space management, disk reliability, stable storage implementation. File concepts, directory structure, and protection.

References:

- Operating system concepts by Silberschatz, Galvin, Gagne, Wiley Student Edition
- Operating system concepts & design by Milan Milenkovic, TMH publication

SEMESTER – IV

Computer Graphics & Multimedia Application
(BCA401)

Course Objective:

The objective of the course is to provide the understanding of the fundamental graphical operations and the implementation on computer, the mathematics behind computer graphics, including the use of spline curves and surfaces. It gives the glimpse of recent advances in computer graphics, user interface issues that make the computer easy, for the novice to use.

UNIT - I: Introduction to Graphics and Graphics Hardware System

Application of computer graphics, Video Display Devices, Raster Scan Display, Random Scan Display, Input Devices, Graphic Software and graphics standards, Numerical based on Raster and Random scan display, Frame buffer, Display processor.

UNIT - II: Output Primitives and Clipping operations

Algorithms for drawing 2D Primitives lines (DDA and Bresenham‚s line algorithm), circles (Bresenham‚s and midpoint circle algorithm), Antialiasing and filtering techniques. Line clipping (cohen-sutherland algorithm), Curve clipping algorithm, and polygon clipping with Sutherland Hodgeman algorithm, Area fill algorithms for various graphics primitives: Scanline fill algorithm, boundary fill algorithm, flood fill algorithm, Polygon representation, various method of Polygon Inside test: Even-Odd method, winding number method, Character generation techniques.

UNIT - III: 2D & 3D Geometric transformation

2D Transformation: Basic transformat ion, Translation, Rotation, Rotation relative to an arbitrary point, scaling, Matrix Representations and Homogeneous coordinates, window to viewport transformation. 3D Concepts: Parallel projection and Perspective projection, 3D Transformations, composite 3D transformation, co-ordinate transformation, Inverse transformation

UNIT - IV: object modeling and Visible Surface detection

fractal geometry methods, fractal dimensions, Geometric construction of deterministic self-similar fractals, Iterated function system to generate fractals. Bezier curves and Bezier surfaces, Bspline curves and surfaces, Visible surface detection method: Basic illumination, diffuse reflection, specular reflection, shadows. Ray tracing method, Depth-buffer method, A-buffer method, Depth-sorting method (painter‚s algorithm), Binary search partition method, Scan line method.

UNIT - V: Introduction to multimedia

Design of animation sequences, Computer Animation languages, Elementary filtering techniques and elementary Image Processing techniques, graphics library functions used in animation design.

Text/References Books:

- Foley et. al., "Computer Graphics Principles& practice", 2nded. AWL, 2000.

- D. Hearn and P. Baker, "Computer Graphics", Prentice Hall, 1986.
- R. Plastock and G. Kalley, "Theory and Problems of Computer Graphics", Schaum"s Series, McGraw Hill, 1986
- R.H. Bartels, J.C. Beatty and B.A. Barsky, "An Introduction to Splines for use in Computer Graphics and Geometric Modeling", Morgan Kaufmann Publishers Inc., 1987.
- C.E. Leiserson, T.H. Cormen and R.L. Rivest, "Introduction to Algorithms", McGraw-Hill Book Company, 1990.
- W. Newman and R. Sproul, "Principles of Interactive Computer Graphics, McGraw-Hill, 1973.
- F.P. Preparata and M.I. Shamos, "Computational Geometry: An Introduction", Springer-Verlag New York Inc., 1985.
- D. Rogers and J. Adams, "Mathematical Elements for Computer Graphics", MacGraw-Hill International Edition, 1989
- David F. Rogers, "Procedural Elements for Computer Graphics", McGraw Hill Book Company, 1985.
- Alan Watt and Mark Watt, "Advanced Animation and Rendering Techniques", Addison-Wesley, 1992

SOFTWARE ENGINEERING AND TESTING
(BCA402)

Course Objectives:

- Understand, learn and apply the theoretical and practical knowledge of software development such as software development paradigms, process, models, tools and techniques.
- Understand and learn the process of software requirements identification, analysis, review, and learn recording requirements in the standard format of the SRS document.
- Understand the various types and levels of software testing and basic approaches of test case designing.

Course Outcomes:

- To classify the various Software Process Models
- To understand the Software Testing Concepts.
- To implement the Software Quality and Control Concepts
- To Design the Test cases and to get familiarity over Automated Testing tools

UNIT I - THE PRODUCT AND THE PROCESS

The Evolving Role of Software– Software Characteristics– Software Applications– Software: A Crisis on the Horizon?- Software Myths- Software Engineering: A Layered Technology– The Software Process– Software Process Models– The Linear Sequential Model– The Prototyping Model- The RAD Model- Evolutionary Software Process Models- Component-Based Development.

UNIT II - SYSTEM ENGINEERING AND ANALYSIS CONCEPTS

Computer-Based Systems– The System Engineering Hierarchy – Business Process Engineering: An Overview– Product Engineering: An Overview– Requirements Engineering– System Modeling– Requirement Analysis- Requirements Elicitation for Software- Software Prototyping- Specification- Specification Review.

UNIT III PRINCIPLES OF TESTING

PRINCIPLES OF TESTING: Introduction - Phases of software – Quality assurance and Quality control - Testing verification and validation - TECHNIQUES: White box - static testing - structural testing - challenges in white box testing - Black box testing.

UNIT IV - TYPES OF TESTING

TYPES OF TESTING: Integration testing - Top-Down Integration – Bottomup integration-Bi-Directional Integration - System - Integration – SYSTEM ACCEPTANCE TESTING: Functional versus Non Functional Testing - Functional System Testing - Non Functional Testing Acceptance Testing.

UNIT V - PERFORMANCE TESTING

PERFORMANCE TESTING: Introduction - Factors of governing - performance testing - Methodology for performance testing - Tools for performance testing - Process for

performance Testing – REGRESSION TESTING: Introduction - Types regression testing - Best pratice in regression testing.

TEXT/REFERENCES BOOKS

- Roger S. Pressman, (2001), "Software Engineering ", Fifth edition, McGraw-Hill Higher Education - A Division of The McGraw-Hill Companies.
- Srinivasan Desikan and Gopalasamy Ramesh, "Software Testing for Principles and Practices", Person Education,.
- William E. Perry (2006), "Effective Methods of Software Testing", 3rd Ed, Wiley
- India.
- RenuRajani, Pradeep Oak (2007), "Software Testing", TMH.

DATA MINING AND WAREHOUSING
(BCA403)

Course Objective:

- Explain the concept of data mining and data warehouse.
- Explain the concept of KDD, OLAP techniques, and NN with genetic algorithms.
- Explain the concept of data warehouse architecture, and database schema.
- Explain the Hardware and operational design of data warehouse, planning and testing the data warehouse.

Course Outcomes:

- To know the basic concepts of data mining
- To classify & cluster the data
- To use association rules on data.
- To introduce the concept of data warehousing
- To recover data in case of data loss

UNIT I - DATA MINING

Introduction- information and production factor- data mining Vs query tools - data mining and marketing -self learning computer system-computer learning-data learning, data mining and data warehouse.

UNIT II - KNOWLEDGE DISCOVERY PROCESS

Data selection- cleaning-enrichment-coding preliminary analysis of data set using traditional query tools-visualization techniques-OLAP tools-decision trees association rules-Neural networks genetic algorithms-KDD(Knowledge discover in databases) environment.

UNIT III - DATA WAREHOUSE – ARCHITECTURE

System process-process architecture, - design – database schema- partitioning strategy-aggregations - data marting-meta data-system and data warehouse process managers.

UNIT IV - HARDWARE AND OPERATIONAL DESIGN

Hardware and operational design of data warehouse - hardware arch-physical layoutsecurity-backup and receiver-service level agreement-operating the data warehouse.

UNIT V - PLANNING, TUNING AND TESTING

Capacity planning- tuning the data warehouse- testing the data warehouses-data warehouse features.

TEXT/REFERENCES BOOKS

- Pieter Adriaans, Dolf, Zantinge (1996), "Data mining", Addison Wesley" (Unit I & II)
- Sam Anahory, Dennis Murray "Data Warehousing in real world" (1997), Addison Wesley.(Unit III, IV & V)

- Mark Hall, Ian Witten and Eibe Frank (2011),"Data Mining: Practical Machine Learning Tools and Techniques", Third edition, Morgan Kaufmann Publisher.

Optimization Techniques
(BCA404)

COURSE OBJECTIVES:

- Enumerate the fundamental knowledge of Linear Programming and Dynamic Programming problems.
- Learn classical optimization techniques and numerical methods of optimization.
- Know the basics of different evolutionary algorithms.
- Explain Integer programming techniques and apply different optimization techniques to solve various models arising from engineering areas.

COURSE OUTCOMES:

- Explain the fundamental knowledge of Linear Programming and Dynamic Programming problems.
- Use classical optimization techniques and numerical methods of optimization.
- Describe the basics of different evolutionary algorithms.
- Enumerate fundamentals of Integer programming technique and apply different techniques to solve various optimization problems arising from engineering areas.

UNIT- I

LINER PROGRAMMING (L.P): Revised Simplex Method, Duel simplex Method, Sensitivity Analysis.

DYNAMIC PROGRAMMING (D.P): Multistage decision processes. Concepts of sub optimization, Recursive Relation-calculusmethod, tabular method, LP as a case of D.P.

UNIT-II

CLASSICAL OPTIMIZATION TECHNIQUES: Single variable optimization without constraints, Multi variable optimization without constraints, multivariable optimization with constraints – method of Lagrange multipliers, Kuhn-Tucker conditions.

NUMERICAL METHODS FOR OPTIMIZATION: Nelder Mead's Simplex search method, Gradient of a function, Steepest descent method, Newton's method.

UNIT-III

MODERN METHODS OF OPTIMIZATION: GENETIC ALGORITHM (GA): Differences and similarities between conventional and evolutionary algorithms, working principle, Genetic Operators- reproduction, crossover, mutation.

GENETIC PROGRAMMING (GP): Principles of genetic programming, terminal sets, functional sets, differences between GA &GP, Random population generation. Fuzzy Systems: Fuzzy set Theory, Optimization of Fuzzy systems

UNIT-IV

INTEGER PROGRAMMING: Graphical Representation, Gomory's Cutting Plane Method, Balas' Algorithm for Zero–OneProgramming, Branch-and-Bound Method.

UNIT-V

APPLICATIONS OF OPTIMIZATION IN DESIGN AND MANUFACTURING SYSTEMS: Formulation of model- optimization of path synthesis of a four-bar mechanism, minimization of weight of a cantilever beam, general optimization model of a machining process,optimization of arc welding parameters, and general procedure in optimizing machining operations sequence.

Text/References Books:

- Engineering Optimization (4th Edition) by S.S.Rao, New Age International,
- Optimization for Engineering Design by Kalyanmoy Deb, PHI Publishers
- Genetic algorithms in Search, Optimization, and Machine learning – D.E.Goldberg, Addison-Wesley Publishers
- Operations Research by Hillar and Liberman, TMH Publishers
- Optimal design – Jasbir Arora, Mc Graw Hill (International) Publishers

Entrepreneurship Development
(BCA405)

COURSE OBJECTIVES:

- To develop and strengthen entrepreneurial quality and motivation in students.
- To provide knowledge and information about the source of help, incentives and subsidies available from government to set up the project
- To impart information about the process, procedure and rules and regulations for setting up a new projects

COURSE OUTCOMES:

- Ability to recognize a business opportunity that fits the individual student
- Demonstrate the understanding of how to launch the individual's entrepreneurial career
- To inculcate the spirit of entrepreneurship in students and make them job creators instead of job seekers

UNIT-I

Entrepreneurship concept- Entrepreneurship as a Career –Entrepreneurial Personality - Characteristics of Successful, Entrepreneur –Knowledge and Skills of Entrepreneur. Problems faced by Women Entrepreneurs – Factors affecting Entrepreneurial Growth –Intrapreneur – Agripreneur.

UNIT-II

Business Environment -Role of Family and Society –Entrepreneurship Development Training and Other Support Organizational Services -Central and State Government Industrial Policies and Regulations.

UNIT-III

Sources of Product for Business -Prefeasibility Study -Criteria for Selection of Product - Ownership -Project Profile Preparation -Matching Entrepreneur with the Project - Feasibility Report Preparation and Evaluation Criteria.

UNIT-IV

Finance and Human Resource Mobilization Operations Planning -Market and Channel Selection -Growth Strategies -Product Launching–Incubation, Venture capital, Angel Investors, Startups-Project Proposal-Project Management.

UNIT-V

Monitoring and Evaluation of Business -Preventing Sickness and Rehabilitation of Business Units-Effective Management of small Business.

TEXTBOOKS :

- Hisrich, Entrepreneurship, Tata McGraw Hill, New Delhi, 2001.

- S.S.Khanka, Entrepreneurial Development, S.Chand and Company Limited, New Delhi, 2001.

REFERENCE BOOKS:

- MathewManimala, Entrepreneurship Theory at the Crossroads, Paradigms & Praxis, Biztrantra ,2ndEdition ,2005
- Prasanna Chandra, Projects –Planning, Analysis, Selection, Implementation and Reviews, Tata McGraw-Hill, 1996.
- P.Saravanavel, Entrepreneurial Development, Ess Pee kay Publishing House, Chennai - 1997.
- Arya Kumar. Entrepreneurship. Pearson. 2012

Python Programming Lab
(BCA405P)

Course Objectives:

- To Introduce Python Programming Language as Multipurpose Programming Language with Features and Applications.
- To Learn Installing Python and Introducing Cross Multiplatform Usage of Python.
- To Practice Basic Language Features of Python and Implement Oops Concepts Using Python.
- Learn core python structures and flow control, Create and run python functions
- Explore the python library functions for various purpose

Course Outcomes:

- Install and use Python on Various Platform.
- Understand and Explain various features of Python language
- Design and Develop Python applications for data analysis using object-oriented concept
- Build package and modules in Python with reusability and exception Aspect
- Write and execute Simple programs for sorting and searching in Python.

UNIT - I

Introduction to python: python interpreter, using python as calculator, python shell, indentation. Atoms, identifiers and keywords, literals, strings, operators (arithmetic operator, relational operator, logical or Boolean operator, assignment, operator, ternary operator, bit wiseoperator, increment or decrement operator) Creating python programs: input and output statements, control statements(branching, looping,conditional statement, exit function, difference between break, continue and pass.), defining functions, default arguments, errors and exceptions. Iteration and recursion: conditional execution, alternative execution, nested conditionals, the return statement.

UNIT - II

Recursion, stack diagrams for recursive functions, multiple assignment, the while statement, tables, two-dimensional tables. Strings and lists: string as a compound data type, length, traversal and the for loop, string slices, string comparison, a find function.

UNIT - III

Looping and counting, list values, accessing elements, list length, list membership, lists and for loops, list operations, list deletion. Cloning lists, nested lists Object oriented programming: introduction to classes, objects and methods, standard libraries.

UNIT - IV

Data structures: arrays, list, set, stacks and queues. Searching and sorting: linear and binary search, bubble, selection and insertion sorting.

References:

- T. Budd, Exploring Python, TMH, 1st Ed, 2011
- How to think like a computer scientist: learning with Python / Allen Downey, Jeffrey Elkner, Chris Meyers. 1st Edition – Freely available online.
- http://docs.python.org/3/tutorial/index.html
- http://interactivepython.org/courselib/static/pythonds

Computer Graphics & Multimedia Application Lab
(BCA406P)

Practical will be based on Paper Computer Graphics & Multimedia Application: Covers Units of Syllabus.

Software Engineering and Testing Lab
(BCA407P)

Practical will be based on Paper Software Engineering and Testing Lab: Covers Units of Syllabus.
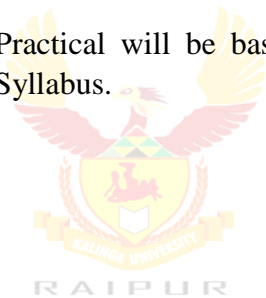
SEMESTER – V

MOBILE APPLICATION DEVELOPMENT
(BCA501)

Course Objectives:

- To introduce Android platform and its architecture.
- To learn activity creation and Android UI designing.
- To be familiarized with Intent, Broad cast receivers and Internet services.
- To work with SQLite Database and content providers.
- To integrate multimedia, camera and Location based services & REST full web Services in Android Application.
- To explore publishing process of Android Application

Course Outcomes:

- Describe Android platform, Architecture and features.
- Design User Interface and develop activity for Android App.
- Use Intent, Broadcast receivers and Internet services in Android App.
- Design and implement Database Application and Content providers.
- Use multimedia, camera and Location based services in Android App.
- Discuss various stages in Android App publishing.

UNIT - I

Various mobile platforms, introduction to android, history and versions of android, android API, android architecture, android runtime, dalvik virtual machine, features of android, introduction and installation of eclipse and ADT plugin and/or introduction and installation ofandroid studio, requirements and installation of android SDK, SDK manager, emulator, avd, android virtual device manager, Google play account, installing android app from google play, APK file.

UNIT - II

Setting up Development Environment, Installing Packages using SDK Manager, Android Project Structure, Creating Hello Android App, Deploy it on USB-connected Android device, Setting up an Emulator, Android Tool Repository, Manifest File, DDMS, File Explorer,Installing and Running Android - Hello App, Activity Life Cycle and its methods, Logcat, Components of an Android App – Activity, Service, Broadcast Receiver, Content Provider

UNIT - III

Layout – Linear Layout, Relative Layout, Scroll View Layout, Table Layout, Frame Layout, UI Resources – Layout Resources, UI Elements, Views – Text view, Edit Text, Button, Check Box, Radio Button, Image Button, Spinner, Navigating between Activities – Intent,Exchanging Data between Activities, Action Bar, Event Handling, Listeners, Notifying the User –Toast.

UNIT - IV

Using Threads, Image View, Exception Handling, Multimedia - Playing Audio using an Intent, Playing Video using an Intent, Playing Audio using Media Player, Playing Video using Video View, Fragment, Fragment Life Cycle.

UNIT - V

SQLite database, creation of database and tables, CRUD operations – create, retrieve, update and delete operations, Cursor, list view,Introduction – REST full web Services, JSON, Google Play Services, location services, publishing apps.

References:

- Michael Burton, Donn Felker, "Android Application Development for Dummies", Dummies, ISBN : 9788126538775
- Pradeep Kothari, " Android Application Development (with Kitkat Support)", Kogent Learning Solutions Inc., Black Book, DreamTech Press, ISBN : 9789351194095
- W. Frank Ableson, Robi Sen, Et. Al., " Android in Action", Manning, ISBN : 9789350042915
- Charlie Collins, Michael Galpin, Et. Al., " Android in Practice", Manning, ISBN : 9789350042397
- Anubhav Pradhan, Anil V Deshpande, "Composing Mobile App, Learn | Explore | Apply using Android", Wiley, ISBN : 9788126546602
- James C. Sheusi, " Android Application Development For Java Programmers", Cengage Learning, 2013.
- Wallace Jackson, "Android Apps for Absolute Beginners", Apress, ISBN : 9788132211372
- http://www.developer.android.com

PRACTICAL LIST ON MOBILE APPLICATION DEVELOPMENT

(BCA506P)

1. Installing Android Environment.
2. Create "Hello World" application. That will display "Hello World" in the middle of the screen in the emulator. Also display "Hello World" in the middle of the screen in the Android Phone.
3. Create an application with login module. (Check username and password).
4. Create spinner with strings taken from resource folder (res >> value folder) and on changing the spinner value, Image will change.
5. Create a menu with 5 options and selected option should appear in text box.
6. Create a list of all courses in your college and on selecting a particular course teacherin-charge of that course should appear at the bottom of the screen.
7. Create an application with three option buttons, on selecting a button color of the screen will change.
8. Create and Login application as above. On successful login, pop up the message.

9. Create an application to Create, Insert, update, Delete and retrieve operation on the database.
10. Create a Simple Application using Android Resources.
11. Create a Simple Application using Layouts.
12. Create a Simple Application using Intents.
13. Create a Simple Application using user interfaces.
14. Create a Simple Application for playing Audio and Video files.

Linux Server Administration.
(BCA502)

Course Objectives:

- Understand fundamental concepts of Linux server administration,
- Will be able to put those concepts to use in real-world situations.
- Understand how to install and customize Linux
- Manage users, permissions, folders, and native applications;
- Configure Internet and intranet services (understanding and managing the Linux TCP/IP networking stack and services);
- Creating and maintaining print, e-mail, FTP, and web servers.

Course Outcomes:

- Write shell program for simple problem
- Use of basic commands of Linux.
- Analyze the need for security measures for Linux sever.
- Managing user account in Linux.
- Install and configure Email Sever, DNS, FTP etc.

UNIT – I

Linux introduction and file system - basic features, different flavors of Linux. Advantages, how Linux access files, storage files, Linux standard directories. Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, creating and viewing files using cat, file comparisons – cmp&comm, view files, disk related commands, checking disk free spaces.

UNIT–II

Understanding shells, Processes in Linux, connecting processes with pipes, Redirecting input output, manual help, Background processing, managing multiple processes, changing process priority with nice, scheduling of processes at command, cron commands, kill, ps, who, sleep, Printing commands, touch, file related commands - wc, cut, dd, etc. Mathematical commandsbc, expr. Creating and editing files with vi& vim editor. Simple filter commands – pr, head, tail, cut, paste, sort, uniq, tr. Filter using regular expressions – grep, egrep, and sed.

UNIT–III

Introduction to shell programming-develop some shell programs. System administration: common administrative tasks, configuration and log files, role of system administrator.Installing requirement, partitioning the hard drive for Linux, installing the Linux system, system startup and shut-down process.

UNIT–IV

Managing user accounts-adding & deleting users, changing permissions and ownerships, creating and managing groups, modifying group attributes, temporary disable user's accounts, creating and mounting file system, file security & permissions, becoming super user using

su.Host name, disk partitions & sizes, users, kernel. Backup and restore files, installing and removing packages. Starting & using KDE &GNOMEgraphical interfaces. Basic networking administration: setting up a LAN using LINUX, choosing peer to peer vs client/server model, setting up an Ethernet LAN, configuring host computers, checking Ethernet connecting, connecting to internet, common networking administrative tasks, configuring Ethernet, initializing Ethernet interface, ifconfig, netstat and netconfig commands,TCP/IP network, DNS services.

UNIT-V

Installation, configuration & Administration of following servers in Linux

- Mail server
- DNS
- Remote access
- FTP server
- Apache web server
- VNC Server

References:

- Fedora 9 And Red Hat Enterprise Linux Bibile by Christopher Negus, Wiley India Ltd.
- Linux Bible, 9ed, by Christopher Negus, Wiley India Ltd
- Linux Administration, by Kogent Learning Solutions Inc., ISBN 13- 9789350044209, ISBN 10-935004420X, Wiley India
- Unix & Shell Programming by Forouzan, Cengage Publications
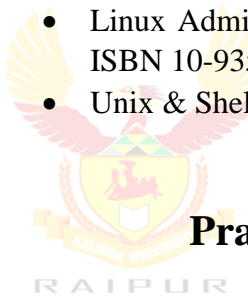
Practical List on Linux Server administration
(BCA507P)

1. Write a Shell script that displays list of all the files in the current directory to whichthe user has read, write and execute permissions?
2. Write a Shell script to list all of the directory files in a directory.
3. Write a Shell script to find factorial of a given integer?
4. Write a shell script to change data format. Show the time taken in execution of this script.
5. Write a shell script to print files names in a directory showing date of creation & serial number of the file.
6. Write a shell script to count lines, words and characters in its input (do not use wc).
7. Write a shell script to compute gcdlcm& of two numbers. Use the basic function to findgcd& LCM of N numbers.
8. Write a shell script to find whether a given number is prime.
9. Write shell script for Showing the count of users logged in.
10. Run all the command given in syllabus using all the syntax in command mode.

Computer Networks

(BCA503)

Course Objectives:

- Build an understanding of the fundamental concepts of computer networking.
- Familiarize the student with the basic taxonomy and terminology of the computer networking.
- Preparing the student for entry in advanced courses of computer networking.
- To gain knowledge of various protocols for network design and maintenance.

Course Outcomes:

- Understand and explain Data Communications System and its components.
- Understand Computer Network basics and OSI and TCP/IP model.
- Understand Networks switching, error detection and error correction techniques.
- Identify the different types of network devices and their functions.
- Familiarity with the various protocols of computer networks.

UNIT-I

Basic concepts: network definition, components of data communication, distributed processing, topology, transmission mode, categories of networks. OSI and TCP/IP models: layers and their functions, comparison of models. Digital transmission: modems, modems, cable modems. Analog and digital signal; data-rate and limits; digital to digital line encoding schemes; parallel and serial transmission; modulation scheme, multiplexing techniques FDM, TDM, transmission media.

UNIT-II

Networks switching techniques and access mechanisms, circuit switching; packet switching, message switching, connection-oriented virtual circuit switching; dial-up modems; digital subscriber, data link layer functions and protocol, error detection and error correction techniques, data -link control framing and flow control, error recovery protocols - stop and wait ARQ, go-back-n ARQ; point to point protocol.

UNIT-III

Multiple access protocol and networks, ALOHA, SLOTTED ALOHA, CSMA/CD, protocols; Ethernet LANS, Token Ring, Token Bus, back-bone networks, network adapters cards, repeaters, hubs, switches, bridges, types of bridges, router and gateways.

UNIT-IV

Networks layer functions and protocols, routing: routing algorithms distance vector routing; shortest path routing, network layer protocol, IP protocol, internet control protocols, Unicasting, multicasting, broadcasting, ISDN: services, historical outline, PRI, BRI.

UNIT-V

Transport layer functions and protocols, overview of TCP and UDP, transport services error and flow control, connection establishment and release, three way handshake, overview of session layer and presentation layer, overview of application layer protocol overview of DNS protocol, overview of internet, WWW,HTTP, FTP, SNMP protocol. Internet services, email services, www services, search service etc.

References:

- B. A. Forouzan: Data Communications and Networking, Fourth edition, THM,
- A.S. Tanenbaum: Computer Networks, Fourth edition PHI.
- Ames Chews Charles Perkins, Matthew Strebe "Networking Essentials: Study Guide "MCSE BPB Publications.
- K.Basandra& S. Jaiswal "Local Area Network" Galgotia Publications
- William Stalling "Data and Computer Communication" Pearson Prentice Hall
- Prakash C Gupta " Data Communication and Computer Network " PHI

Embedded Systems

(BCA504A)

Course Objectives:

- Introduce students to the features, applications of embedded systems
- Develop an understanding of the design challenges of embedded systems
- Understand the basic architecture of 8051 microcontroller
- Introduce students to Embedded C programming
- Enable students to develop basic programs for embedded systems using Embedded C.

Course Outcomes:

- Explain hardware and software design requirements of Embedded Systems
- Discuss the architecture of 8051 processor
- Describe 8051 Processor Addressing modes and instruction sets
- Use Embedded C for writing basic programs for embedded systems
- Examine the use of various Embedded C programming constructs for writing programs for embedded systems.

UNIT - I

Fundamentals of Embedded Systems: Introduction, Features, Applications of Embedded Systems, Subsystems in an Embedded System.Design Considerations of Embedded Systems: Design Challenges, Common Design Metrics, Design Trade-offs and Performance Classification of Computer Architecture: Basic operation of a computer system, CPU Architecture, Microprocessor, Microcomputer.Introduction to Real Time Operating Systems.

UNIT - II

Microcontrollers: Evolution and Uses in Embedded Systems and its Advantages. Architecture of 8051 Microcontroller: Introduction, Block Diagram, Registers, Internal Memory, Counters, I/O Ports, Basic Concepts in Serial I/O.

8051 Processor Addressing modes and Instruction Set: Assembly language programming in 8051, Data Types, Addressing Modes,Arithmetic and Logical Operators Interfacing 8051 with external devices: LED's and SSD.

UNIT - III

Introduction to Embedded C, Difference between C & Embedded C, Programming style, Basic structure of the program. Keywords & Identifiers, Data type & its memory representation, Arrays and strings , Input and Output.

UNIT - IV

Types of Operators, Bitwise Operators Decision making with if statement, If….else statement, Switch statement, and GOTO statement, The While and Do – While statements, For statement Embedded C Programming : Functions : Why Functions, Types of Functions, A Multi functional program, Return values & their types.

UNIT - V

Case Study : Use of Embedded systems is designing various commercial applications / appliances : Home Automation Systems, Washing machine etc.

Reference:

- K V K Prasad, "Embedded/Real Time Systmes : Concepts, Design and Programming", Dreamtech Press
- Steve Furber, "ARM System-on-chip Architecture", 2e, Addison Wesley
- Tammy Noergaard, "Embedded System Architecture : A comprehensive Guide for Engineers and Programmers", Newnes (Elsevier)
- Shibu K V, "Introduction to Embedded Systems", Tata McGraw Hill
- Raj Kamal, "Embedded Systems : Architecture, Programming and Design", 2e, Tata McGraw Hill
- K Uma Rao, AndhePallavi, "The 8051 and MSP430 Microcontrollers : Architecture, Programming and Applications, Wiley
- Bahadure, Chandrakar, " Microcontrollers and Embedded System Design", Wiley
- Raj Kamal, "Embedded Systems : Architecture, Programming and Design", Tata McGraw Hill.

Natural Language Processing

(BCA504B)

Course Objective:

- Understand natural language processing and to learn how to apply basic algorithms in this field.
- Get acquainted with the basic concepts and algorithmic description of the main language levels: morphology, syntax, semantics, and pragmatics.
- Implement a rule based system to tackle morphology/syntax of a Language
- Compare and contrast use of different statistical approaches for different types of applications
- Design a tag set to be used for statistical processing keeping an application in mind, design a Statistical technique for a new application
- Design an innovative application using NLP components

Course Outcome:

- Understand the computational properties of natural languages and the commonly used algorithms for processing linguistic information.
- Understand the information retrieval techniques using NLP
- Apply mathematical techniques that are required to develop NLP.
- Analyze various NLP algorithms and text mining NLP applications.
- Design real world NLP applications such as machine translation, text categorization, text summarization, information extraction by
- applying NLP techniques.

UNIT - I

Introduction: History of NLP, Generic NLP system, levels of NLP , Knowledge in language processing , Ambiguity in Natural language , stages in NLP, challenges of NLP ,Applications of NLP. Word Level Analysis: Morphology analysis –survey of English Morphology, Inflectional morphology & Derivational morphology, Lemmatization, Regular expression, finite automata, finite state transducers (FST) ,Morphological parsing with FST , Lexicon free FST Porter stemmer. N –Grams- N-gram language model.

UNIT - II

Syntax analysis: Part-Of-Speech tagging(POS)- Tag set for English (Penn Treebank) , Rule based POS tagging, Stochastic POS tagging, Issues –Multiple tags & words, Unknown words. Introduction to CFG, Sequence labeling: Hidden Markov Model (HMM), Maximum Entropy.

UNIT - III

Semantic Analysis: Lexical Semantics, Attachment for fragment of English- sentences, noun phrases, Verb phrases, prepositional phrases, Relations among lexemes & their senses – Homonymy, Polysemy, Synonymy, Hyponymy, Robust Word Sense Disambiguation (WSD),Dictionary based approach.

UNIT - IV

Text Summarization, Text Classification, Text summarization- LEXRANK , Optimization based approaches for summarization , Summarization evaluation, Text classification.

UNIT - V

Sentiment Analysis and Opinion Mining, Sentiment Analysis introduction , Sentiment Analysis - Affective lexicons, Learning affective lexicons, Computing with affective lexicons, Aspect based sentiment analysis.

Reference:

- Dan Jurafsky and James Martin. "Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition", Prentice Hall, Second Edition, 2009.
- Steven Bird, Ewan Klein, Natural Language Processing with Python, O'Reilly
- Christopher D.Manning and HinrichSchutze, ― Foundations of Statistical Natural Language Processing ―, MIT Press, 1999.
- Siddiqui and Tiwary U.S., Natural Language Processing and Information Retrieval, Oxford University Press (2008).
- Daniel M Bikel and ImedZitouni ― Multilingual natural language processing applications‖ Pearson, 2013
- Alexander Clark (Editor), Chris Fox (Editor), Shalom Lappin (Editor) ― The Handbook of Computational Linguistics and Natural Language Processing ― ISBN: 978-1-118-
- Brian Neil Levine, An Introduction to R Programming
- Niel J le Roux, SugnetLubbe, A step by step tutorial : An introduction into R application and programming
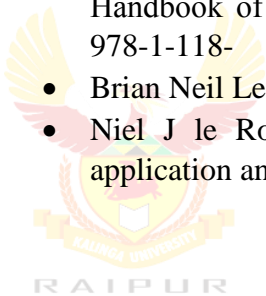
Enterprise Resource Planning
(BCA504C)

Course Objective:

This course examines the evolution of enterprise resource planning (ERP) systems - from internally focused client/server systems to externally focused e-business. This class studies the types of issues that managers will need to consider in implementing cross-functional integrated ERP systems. The objective of this course is to make students aware of the potential and limitations of ERP systems. This objective will be reached through hands-on experience, case studies, lectures, guest speakers and a group project. The course would equip students with the basics of E-Commerce, technologies involved with it and various issues associated with.

UNIT - I: Introduction ERP

An Overview, Enterprise-An Overview, Benefits of ERP, ERP and Related Technologies, Business Process Reengineering (BPR), Data Warehousing, Data Mining, On-line Analytical Processing (OLAP), Supply Chain Management, Management Information systems (MIS), Decision support system (DSS), Executive Information systems (EIS). ERP – A Manufacturing Perspective Materials Requirement Planning (MRP), Bill of Material (Bom), Distribution Requirements Planning (DRP), JIT & Kanban, CAD/CAM, Product Data Management (PDM), Benefits of PDM, MTO, MTS, ATO, ETO, CTO.

UNIT - II: ERP Implementation

To be or not to be, ERP Implementation Lifecycle, Implementation Methodology, Not all Packages are Created Equal!, ERP Implementation-The Hidden Costs, Organizing the Implementation, Vendors, Consultants and Users, Contracts with Vendors, Consultants and Employees, Project Management and Monitoring, After ERP Implementation.

UNIT - III: The Business UNIT - s

Business UNIT - s in an ERP Package, Finance, Manufacturing (Production), Human Resources, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution

UNIT - IV: The ERP Market

ERP Market Place, SAP AG, PeopleSoft, Baan Company, JD Edwards World Solutions Company, Oracle Corporation, QAD, System Software Associates, Inc. (SSA) ERP-Present and Future Turbo Charge the ERP System, Enterprise Integration Applications (EIA), ERP and E-Commerce, ERP and Internet, Future Directions in ERP, Appendices"

UNIT - V: Benefits of ERP

Time Reduction, Resource Utilization, Performance, Customer Satisfaction, Flexibility, Quality, Accuracy.

Text & References:

- S. Sadagopan, "Enterprise Resource Planning", Tata McGraw Hill 2000

- Bajaj, Kamlesh K. and Nag, Debjani, E-Commerce: The Cutting Edge of Business, TataMcGraw-Hill Publishing Company
- Alexis Leon, "Enterprise Resource Planning", Tata McGraw Hill 2001

Green Computing
(BCA505A)

Course Objective:

- Explain why Green IT is important to the enterprise over all
- Create awareness among stakeholders and promote green initiatives in their environments leading to a green movement.
- Adopt special skills such as knowledge about energy efficiency, ethical IT assets disposal, carbon footprint estimation.
- Create eco-friendly environment.
- Conduct basic equipment usage audits
- Improve energy efficiency of their personal computing environment as well as the enterprise-wide computing environment

Course Outcome:

- Acquire expertise for improving the energy efficiency for laptops and personal computers by reducing the power consumption requirements
- Assess enterprise-wide and personal computing and computing energy consumption
- Recognize the necessity for long-term sustainability in IT
- Formulate plans for reducing IT heating and cooling requirements
- Evaluate the regulatory and governance issues surrounding IT
- Choose the best sustainable hardware for their applications

UNIT - I

Trends and Reasons to Go Green: Overview andIssues, Consumption Issues, Minimizing PowerUsage, Cooling.

Introduction to Green IT: GreenIT, Holistic Approach to GreeningIT, Greening byIT (can be used for case study also)

- Using RFID for EnvironmentalSustainability
- SmartGrids
- Smart Buildings and Homes
- Green Supply Chain andLogistics
- Enterprise-Wide EnvironmentalSustainability

UNIT - II

Green Hardware: Introduction, Life Cycle of a Device or Hardware, Reuse, Recycle and Dispose

Green Software: Introduction, Energy-Saving SoftwareTechniques, Sustainable Software Development

UNIT - III

Green Data Centers: Data Centre ITInfrastructure, Data Centre Facility Infrastructure: Implications for Energy, Efficiency, IT InfrastructureManagement, Green Data Centre MetricsGreen Data Storage: Introduction, Storage Media PowerCharacteristics, Energy Management Techniques for HardDisks, System-Level EnergyManagementGreen Networks and Communications: Introduction, Objectives of Green NetworkProtocols, Green Network Protocols andStandards

UNIT - IV

Enterprise GreenIT Strategy: Introduction, Approaching Green IT Strategies, Business Drivers of Green IT Strategy, Organizational Considerations in a Green ITStrategy, Steps in Developing a Green ITStrategy, Metrics and Measurements in GreenStrategies.

Enterprise Green IT Readiness: Background: Readiness and Capability, Development of the G-Readiness Framework, Measuring an Organization's G-Readiness.

UNIT - V

Managing Green IT: Introduction, Strategizing GreenInitiatives, Implementation of GreenIT, InformationAssurance, Communication and SocialMedia.

Green Cloud Computing and Environmental Sustainability: Cloud Computing and Energy Usage Model, Features of Clouds Enabling Green Computing, Towards Energy Efficiency of Cloud Computing, Green Cloud Architecture

The Future of Green IT: Green Computing and theFuture, Megatrends for GreenComputing, Tele-presence Instead ofTravel, Tele-commuting Instead ofCommuting, Deep GreenApproach.

Reference:

- Green IT: Reduce Your Information System's Environmental Impact While Adding to the Bottom Line,TobyVelte, Anthony Velte, Robert Elsenpeter, 2008, McGraw Hill.
- Harnessing Green IT,SanMurugesan, G. R. Gangadharan, 2013, WILEY.
- Green Computing-Tools and Techniques for saving energy, money and resources, Bud E. Smith, 2014, CRCPress.
- GREEN IT FOR SUSTAINABLE BUSINESS PRACTICE, Mark G. O'Neill, An ISEB FoundationGuide.
- Green Computing and Green IT BestPractices, Jason Harris
- The Green of IT – How Companies Can Make a Difference for the Environment, John Lamb, IBM Press (2009).
- Green Project Management, Richard Maltzman and David Shirley, CRC Press a Taylor and Francis Company (2010).
- Foundations of Green IT, Marty Poniatowski, Prentice Hall, 2009

Image Processing

(BCA505B)

Course Objectives:

- Study the fundamental concepts of Digital Image processing and to discuss mathematical transforms .
- Study image enhancement techniques and explore DCT and DFT techniques
- Expose students to various image enhancement, restoration methods and morphological operations.
- Analyze Image Data Compression and morphological Operation
- Explain various Applications of Image Processing

Course Outcomes

- Explain the fundamental concepts of a digital image processing System
- Apply techniques for enhancing digital images
- Examine the use of Fourier transforms for image processing in the frequency domain
- Compare various Image compression standards and morphological Operation
- Identify various Applications of Image Processing

UNIT - I

Introduction to Image Processing Systems: Image representation, basic relationship between pixels, elements of DIP system, elements of visual perception-simple image formation model Vidicon and Digital Camera working principles Brightness, contrast, hue, saturation, mach band effect, Colour image fundamentals-RGB, CMY, HSImodels 2D sampling,quantization.

UNIT - II

Image Enhancement in the Spatial domain: Spatial domain methods: point processing-intensity transformations, histogram processing, image subtraction, image averaging Spatial filtering- smoothing filters, sharpening filters Frequency domain methods: low pass filtering, high pass filtering, homomorphic filter.

UNIT - III

Discrete Fourier Transform: Discrete Fourier Transform: Introduction , DFT and its properties, FFT algorithms ñ direct, divide and conquer approach, 2-D DFT &FFTImage Transforms : Introduction to Unitary Transform, DFT, Properties of 2-D DFT, FFT, IFFT, Walsh transform,Hadamard Transform, Discrete Cosine Transform, Discrete Wavelet Transform: Haar Transforms, KL Transform

UNIT - IV

Image Restoration and Image Segmentation: Image degradation, Classification of Image restoration Techniques, Image restoration Model, Image Blur, Noise Model : Exponential, Uniform, Salt and Pepper, Image Restoration Techniques : Inverse Filtering, Average Filtering,Median Filtering. The detection of discontinuities - Point, Line and Edge detections:

Prewit Filter, Sobel Filter, Fri-Chen Filter Hough Transform, Thresholding Region based segmentation Chain codes, Polygon approximation, Shape numbers.

UNIT - V

Image Data Compression and morphological Operation: Need for compression, redundancy, classification of image compression schemes,Huffman coding, arithmetic coding, dictionary based compression, transform Based compression, Image compression standards- JPEG &MPEG,vector quantization, wavelet based image compression.Morphological Operation: Introduction, Dilation, Erosion, Opening, Closing.

Applications of Image Processing: Case Study on Digital Watermarking, Biometric Authentication (Face, Finger Print, Signature Recognition), Vehicle Number Plate Detection and Recognition, Object Detection using Correlation Principle, Person Tracking using DWT, Handwritten and Printed Character Recognition, Contend Based Image Retrieval, Text Compression.

Reference:

- R.C.Gonzalez&R.E.Woods, Digital Image Processing, Pearson Education, 3rd edition, ISBN. 13:978-01316872882 S.
- Jayaraman Digital Image Processing TMH (McGraw Hill) publication, ISBN- 13:978-0-07- 0144798
- Gonzalez, Woods & Steven, Digital Image Processing using MATLAB, Pearson Education, ISBN-13:978-0130085191
- William K. Pratt, "Digital Image Processing", John Wiley, NJ, 4th Edition,200
- Sid Ahmed M.A., "Image Processing Theory, Algorithm andArchitectures", McGraw-Hill, 1995.Umbaugh, "Computer Vision".
- Anil K.Jain,Fundamentals of Digital Image Processing,Prentice Hall of India,2nd Edition,2004.

BIG DATA ANALYTICS
(BCA505C)

Course Objective:

Students will gain knowledge on analyzing Big Data. It serves as an introductory course for graduate students who are expecting to face Big Data storage, processing, analysis, visualization, and application issues on both workplaces and research environments.

UNIT - I: INTRODUCTION TO BIG DATA

Introduction– distributed file system–Big Data and its importance, Four Vs, Drivers for Big data, Big data analytics, Big data applications. Algorithms using map reduce Big Data – Apache Hadoop & Hadoop EcoSystem, MovingData in and out of Hadoop – Understanding inputs and outputs ofMapReduce -, Data Serialization.

UNIT - II: HDFS, HIVE AND HIVEQL, HBASE

HDFS-Overview, Installation and Shell, Java API; Hive Architecture, Comparison with Traditional Database, HiveQLQuerying Data, Sorting And Aggregating, Map Reduce Scripts, Joins& Sub queries, HBase concepts, Advanced Usage, Schema Design,Advance Indexing, PIG, Zookeeper , how it helps in monitoring acluster, HBase uses Zookeeper and how to Build Applications withZookeeper.

UNIT - III: SPARK

Introduction to Data Analysis with Spark, Downloading Sparkand Getting Started, Programming with RDDs

UNIT - IV: NoSQL

What is it? Where It is Used Types of NoSQL databases, Why NoSQL?, Advantages of NoSQL, Use of NoSQL in Industry, SQL vs NoSQL, NewSQL.

Text & References:

- Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, by Chris Eaton, Paul Zikopoulos
- Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends, By Michael Minelli, Michele Chambers, AmbigaDhiraj
- Boris lublinsky, Kevin t. Smith, AlexeyYakubovich, "Professional Hadoop Solutions", Wiley, ISBN: 9788126551071, 2015.
- BIG Data and Analytics , Sima Acharya, SubhashiniChhellappan, Wiley

Internship Assessment

(BCA508P)

SEMESTER – VI

CLOUD COMPUTING

(BCA601)

Course Objectives:

- Basics of cloud computing.
- Key concepts of virtualization.
- Different Cloud Computing services
- Cloud Implementation and its tools
- Key components of Amazon Web Services
- Cloud Backup and solutions

Course Outcomes:

- Define Cloud Computing and memorize the different Cloud service and deployment models
- Describe importance of virtualization along with their technologies.
- Use and Examine different cloud computing services
- Analyze the components of Google Cloud platform
- Describe the key components of Amazon web Service
- Design & develop backup strategies for cloud data based on features.

Unit - I

Introduction to Computing Paradigms: High-Performance Computing, Parallel Computing, Distributed Computing, Cluster Computing, Grid Computing, Cloud Computing, Biocomputing, Mobile Computing, Quantum Computing, Optical Computing, Nano-computing, Network Computing. Cloud Computing Fundamentals: Motivation, Need, Definition of Cloud Computing. Principles of Cloud computing: Five Essential Characteristics, Four Cloud Deployment Models, Three Service Offering Models, Cloud Ecosystem, Requirements for Cloud Services. Cloud Computing Architecture: cloud Architecture, User/Client Layer, Network Layer, Cloud Management Layer, Hardware Resource Layer, Network Connectivity in Cloud Computing, Public Cloud Access Networking, Private Cloud Access Networking.

UNIT – II

Cloud Computing Management: Cloud Application, Benefits and Drawbacks Applications on the Cloud, Managing the Cloud, Managing the Cloud Infrastructure, Managing the Cloud Application, Migrating Application to Cloud, Cloud Deployment Models: Private Cloud,Outsourced Private Cloud, Community Cloud, On-Premise Community Cloud, Hybrid Cloud. Cloud Service Models: Infrastructure as a Service, : Platform as a Service, Software as a Service, Introduction to Open Source Tools for IaaS, Paas& SaaS : Apache.

UNIT - III

Technological Drivers for Cloud Computing: SOA and Cloud, SOA and SOC, Benefits of SOA, Multi-core Technology: Multi-core Processors and VM Scalability, Memory and Storage

Technologies, Cloud Storage Requirements, Networking Technologies, Web 2.0 :Characteristics, Difference from Web 1.0, Applications, Social Media, Marketing, EducationWeb 3.0:Components , Semantic Web, Web Services, Characteristics, Convergence of Cloud and Web 4.0, Connecting Information: Facebook. Agile Software Models: Agile SDLC forCloud Computing, Features of Cloud SDLC, Agile Software Development Process, Advantages of Agile. Cloud Application Development Platforms: Windows Azure, Google App Engine, Forcecom. IBM Cloud Computing API

UNIT - IV

Virtualization : Full Virtualization, Para virtualization, Hardware-Assisted Virtualization, Hypervisor, OS Virtualization, Server Virtualization, Memory Virtualization, Storage Virtualization, Network Virtualization, Application Virtualization, Processor Virtualization,Memory Virtualization, Storage Virtualization, Network Virtualization, Data Virtualization, Application Virtualization, Hypervisors, Types of Hypervisors, Security Issues and Recommendations, From Virtualization to Cloud Computing VMware. Microsoft Hyper-V.

UNIT - V

Cloud Service Providers ; EMC, EMC IT, Captiva Cloud Toolkit, Google, Cloud Platform, Cloud Storage, Google Cloud Connect, Google Cloud Print, Google App Engine, Amazon Web Services, Amazon Elastic Compute Cloud, Amazon Simple Storage Service, Amazon SimpleQueue Service, Microsoft Azure, Microsoft Assessment and Planning Toolkit, SharePoint, IBM SmartCloud. Security in Cloud Computing, Cloud General Challenges,

Text Books:

- Essentials of Cloud Computing, K Chandrasekaran, CRC Press [ISBN: 3: 978--4822-0544-2]
- Raj Kumar Buyya, James Broberg and rezeiM.Goscinski, -Cloud Computing: Principles and Paradigms,-Wiley 2011.
- Srinivasan, J.Suresh,-Cloud Computing – a Practical Approach for Learning and Implementation, Pearson India, [ISBN 978131776513]
- Toby Velte, Anthony Velte, Robert Elsenpeter,-Cloud Computing, a Practical Approach - McGraw Hill, 2010 [ISBN: 0071626948]

References:

- Greg Schulz -Cloud and Virtual Data Storage Networking, Auerbach Publications [ISBN: 978-1439851739].
- Marty Poniatowski-Foundations of Green It- [ISBN: 978-0137043750].
- Learning Spring Application Development, Ravi Kant Soni, Packt Publishing.
- Michael Miller, Cloud Computing, 2008.
- Judith Hurwitz, Robin Bllor, Marcia Kaufman, Fern Halper, Cloud Computing for Dummies, 2009.
- ° BorkoFurht, Armando Escalante (Editors), Handbook of Cloud Computing, Springer, 2010.

Artificial Intelligence and Machine Learning
(BCA602A)

Course Objective:

- Understand different AI concepts
- Elucidate knowledge of Artificial Intelligence techniques for problem solving
- Understand Artificial intelligence search strategies and neural networks
- Provide an insight into the fundamentals of Machine Learning Techniques
- Become familiar with regression methods, classification methods, clustering methods
- Become familiar with methods to improve the learning

Course Outcome:

- Interpret Artificial Intelligence concepts intelligence concepts
- Apply Artificial intelligence techniques for problem solving
- Analyze the fundamentals of machine learning, the learning algorithms and the paradigms of supervised and un-supervised learning
- Identify methods to improve machine learning results for better predictive performance

UNIT - I

Introduction: Artificial Intelligence, Application of AI, AI Problems, Problem Formulation, Intelligent Agents, Types of Agents, AgentEnvironments, PEAS representation for an Agent, Architecture of Intelligent agents. Reasoning and Logic, Prepositional logic, First order logic, Using First-order logic, Inference in First-order logic, forward and Backward Chaining

UNIT - II

Search Strategies: Solving problems by searching, Search- Issues in The Design of Search Programs, Un-Informed Search- BFS, DFS; Heuristic Search Techniques: Generate-And- Test, Hill Climbing, Best-First Search, AI Algorithm, Alpha beta search algorithm, Problem Reduction, AO*Algorithm, Constraint Satisfaction, Means-Ends Analysis

UNIT - III

Artificial Neural Networks: Introduction, Activation Function, Optimization algorithm-Gradient decent, Networks- Perceptrons, Adaline,Multilayer Perceptrons ,Backpropogation Algorithms Training Procedures, Tuning the Network Size Introduction to ML: Machine Learning basics, Applications of ML,Data Mining Vs Machine Learning vs Big Data Analytics. Supervised Learning- Naïve Base Classifier, Classifying with k-Nearest Neighbour classifier, Decision Tree classifier, Naive Bayes classifier. Unsupervised Learning - Grouping unlabeled items using k-means clustering, Association analysis with the Apriori algorithm Introduction to reinforcement learning.

UNIT - IV

Forecasting and Learning Theory: Non-linear regression, Logistic regression, Random forest, Baysian Belief networks, Bias/variancetradeoff, Tuning Model Complexity, Model Selection Dilemma Clustering: Expectation-Maximization Algorithm, Hierarchical

Clustering,Supervised Learning after Clustering, Choosing the number of clusters, Learning using ANN.

UNIT - V

Kernel Machines & Ensemble Methods: Introduction, Optimal Separating Hyperplane, Separating data with maximum, margin, Support Vector Machine (SVM), Finding the maximum margin, The Non-Separable Case: Soft Margin Hyperplane, Kernel Trick, DefiningKernels Ensemble Methods : Mixture Models, Classifier using multiple samples of the data set, Improving classifier by focusing on error, weak learner with a decision stump, Bagging , Stacking, Boosting ,Implementing the AdaBoost algorithm, Classifying with AdaBoostBootstrapping and cross validation.

Dimensionality Reduction: Introduction, Subset Selection, Principal Components Analysis, Multidimensional Scaling, Linear Discriminant Analysis.

Reference:

- George F Luger, Artificial Intelligence, Fifth Edition-2009, Pearson Education Publications ,ISBN-978-81-317-2327-2
- Stuart Russell, Peter Norvig ,Artificial Intelligence – A Modern Approach, Pearson Education / Prentice Hall of India, 3rd Edition, 2009 .ISBN- 13: 978- 0136042594
- Elaine Rich, Kevin Knight, S.B. Nair, Artificial Intelligence, 3rd Edition, Tata McGraw Hill-2008., ISBN 10: 0070087709 / ISBN 13: 9780070087705
- Anandita Das ,Artificial Intelligence and Soft Computing for Beginners-,2nd Edition, ShroffPublication, ISBN- 9789351106159
- Nils J. Nilsson, ―Artificial Intelligence: A new Synthesis, Morgan Kaufmann Publishers, Harcourt Asia Pvt. Ltd., 2000, ISBN-1-55860-535-5
- Kumar Satish ,Neural Networks, Second edition Tata McGraw Hill-,2013, ISBN1259006166, 9781259006166
- EthemAlpaydın, Introduction to Machine Learning, PHI, Third Edition, ISBN No. 978- 81-203- 5078-6. (this can be made the text book)

Artificial Intelligence and Machine Learning Practical List
(BCA605P)

1. Implementation of Logic programming using LISP /PROLOG-DFS for water jug problem / BFS for tic-tac-toe problem/ Hill-climbing to solve 8- Puzzle Problem.
2. Introduction to Python Programming: Learn the different libraries - NumPy, Pandas, SciPy, Matplotlib, Scikit Learn.
3. Implementation of Linear Regression, Logistic regression, KNN- classification.
4. Implementation of dimensionality reduction techniques: Features Extraction and Selection, Normalization, Transformation, Principal Components Analysis.
5. Implementation of K-Means and K-medoid clustering algorithm.
6. Implementation of Classifying data using Support Vector Machines (SVMs).
7. Implementation of Bagging Algorithm: Decision Tree, Random Forest.
8. Implementation of Boosting Algorithms: AdaBoost, Stochastic Gradient Boosting, Voting Ensemble.
9. Deployment of Machine Learning Models.

Advance Neural Network & Deep Learning
(BCA602B)

Course Objectives:

- To understand the theoretical foundations, algorithms and methodologies of Neural Network
- To design and develop an application using specific deep learning models
- To provide the practical knowledge in handling and analysing real world applications.

Course Outcomes:

- Recognize the characteristics of deep learning models that are useful to solve real-world problems.
- Understand different methodologies to create application using deep nets.
- Identify and apply appropriate deep learning algorithms for analyzing the data for variety of problems.
- Implement different deep learning algorithms
- Design the test procedures to assess the efficacy of the developed model.
- Combine several models in to gain better results

UNIT - I

MACHINE LEARNING BASICS: Learning algorithms, Maximum likelihood estimation, Building machine learning algorithm, Neural Networks Multilayer Perceptron, Back-propagation algorithm and its variants Stochastic gradient decent, Curse of Dimensionality

UNIT - II

DEEP LEARNING ARCHITECTURES: Machine Learning and Deep Learning, Representation Learning, Width and Depth of Neural Networks, Activation Functions: RELU, LRELU, ERELU, Unsupervised Training of Neural Networks, Restricted Boltzmann Machines, Auto Encoders, Deep Learning Applications.

UNIT - III

CONVOLUTIONAL NEURAL NETWORKS: Architectural Overview,Motivation, Layers, Filters, Parameter sharing, Regularization, Popular CNN Architectures: ResNet, AlexNet - Applications.TRANSFER LEARNING:Transfer learning Techniques, Variants of CNN: DenseNet, PixelNet.

SEQUENCE MODELLING – RECURRENT AND RECURSIVE NETS: Recurrent Neural Networks, Bidirectional RNNs, Encoder-decoder sequence to sequence architectures - BPTT for training RNN, Long Short Term Memory Networks.

UNIT - IV

AUTO ENCODERS: Under complete Auto encoder, Regularized Auto encoder, stochastic Encoders and Decoders,Contractive Encoders.

UNIT - V

DEEP GENERATIVE: Deep Belief networks, Boltzmann Machines,Deep Boltzmann Machine, GenerativeAdversial Networks.

Text Book(s) and Journals

- Ian Goodfellow, YoshuaBengio and Aaron Courville, " Deep Learning", MIT Press, 2017.
- Josh Patterson, Adam Gibson "Deep Learning: A Practitioner's Approach", O'Reilly Media, 2017
- Umberto Michelucci "Applied Deep Learning. A Case-based Approach to Understanding Deep Neural Networks" Apress, 2018.

Reference Books

- Kevin P. Murphy "Machine Learning: A Probabilistic Perspective", The MIT Press, 2012.
- EthemAlpaydin,"Introduction to Machine Learning", MIT Press, Prentice Hall of India, Third Edition 2014.
- Giancarlo Zaccone, Md. RezaulKarim, Ahmed Menshawy "Deep Learning with TensorFlow: Explore neural networks with Python", Packt Publisher, 2017.
- Antonio Gulli, Sujit Pal "Deep Learning with Keras", Packt Publishers, 2017.
- Francois Chollet "Deep Learning with Python", Manning Publications, 2017.

Internet of Things (IOT)

(BCA602C)

Course Objective:

This course elucidates concepts related to Internet of Things. The students will get hands-on experience in working with Raspberry Pi 3 and exploring IoT.

Course Outcome:

After completion of the course, the students will be able to understand the working of Raspberry Pi, its features and how various components can be used with Pi. The students will be able to understand IoT practically

UNIT - I

Overview of IoT: Understanding IoT fundamentals, IOT Architecture, protocols, Various Platforms for IoT, Real time Examples of IoT, Overview of IoT components and IoT Communication TechnologiesGetting started with Raspberry Pi:Introduction to Raspberry Pi, Comparison of various Rpi Models, Understanding SoC architecture and SoCs used in Raspberry Pi, Pin Description of Raspberry Pi, On-board components of Rpi, Projects using Raspberry Pi

UNIT - II

Booting Up RPi- Operating System and Linux Commands: Linux- Introduction, Architecture, File System, Raspbian O.S.- Introduction, Tools like Leafpad Editor, Installing Raspbian on Pi, First boot and Basic Configuration of Pi, Popular Linux Commands

UNIT - III

Working with RPi using Python and Sensing Data using Python: Introduction, Python vs. Other Languages, Applications of Python, Understanding Python, Interpreted Languages, Variables, Keywords, Operators and Operands, Data Types in Python, Importing Libraries, Flow Control, Conditional Statement, Loops, Sensors Interfacing- Temperature and Humidity Sensor (DHT11), Motion Sensor(PIR), Obstacle detection using Ultrasonic sensor, etc., Communicating using RPi- GSM interfacing, Accessing on-board Wi-Fi, Connecting Database with RPi.

UNIT - IV

C Language- Imbibing RPi with C: C Basics- compiled language, C Concepts- data types, variables, conditional statement, loops, Library installation, Compiling C programs, Using Wiring Pi for GPIO Programming, Interfacing Rpi using C

UNIT - V

IoT Design using Raspberry Pi: IoT Applications based on Pi, LAMP Web-server, GPIO Control over WebBrowser, Creating Custom Web Page for LAMP, Communicating data using on-board module, Home automation using Pi, Node-RED, MQTT Protocol, Using Node-RED Visual Editor on Rpi.

Text & References:

- Simon Monk, "Programming the Raspberry Pi: Getting Started with Python", January 2012, McGraw Hill Professional
- Eben Upton and Gareth Halfacree, "Raspberry Pi User Guide", August 2016, 4th edition, John Wiley & Sons
- Alex Bradbury and Ben Everard, "Learning Python with Raspberry Pi", Feb 2014, John Wiley & Sons.

List of Programs:

1. Getting started with Raspberry Pi, Install Raspian on your SD card
2. Linux basic commands.
3. Coding simple programs in Python.
4. How to use Python-based IDE (integrated development environments) for the Raspberry Pi and how to trace and debug Python code on the device
5. How to have your Raspberry Pi interact with online services through the use of public APIs andSDKs.

Digital Marketing and Business Analytics
(BCA603A)

Course Objective:

1. Examine and explore the role and importance Digital Marketing in the current business scenario.
2. Familiarize with the various Digital Marketing Tools.
3. Apply Digital Marketing tools for formulating a Digital Marketing Strategy.
4. Understand Digital Marketing Campaigns using various Tools and measure their effectiveness.

Course Outcome:

1. Understand the role of Digital Marketing Remembering
2. Demonstrate use of various Digital Marketing Tools.
3. Discuss key element of Digital Marketing Strategy.
4. Understand use of Digital Marketing Tools for Digital Marketing Campaigns
5. Assess / Measure the effectiveness of the Digital Marketing Campaigns.
6. Demonstrate practical skills using common digital marketing tools like SEO, SEM, Content Marketing

Unit - I

Fundamentals of Digital Marketing: Digital Marketing. Digital Marketing Strategy. Skills Required in Digital Marketing, Digital Marketing Plan, Digital Marketing: Introduction to Display Marketing, Types of Display Ads, Buying Models, Display Plan, Analytics Tools. Dignified Digital Marketing – Ethics and Data Privacy.

Unit - II

Search Engine Advertising: Introduction, Understanding Ad Placement, Understanding AdRanks, Creating First Ad Campaign, Enhance Your Ad Campaign, Performance Reports. Social Media Marketing: Building a Successful Strategy, Facebook Marketing: Facebook Marketing for Business, Anatomy of an Ad Campaign, Adverts, Facebook Insights, Other Marketing Tools, Other Essentials. Instagram Mobile Marketing: Mobile Usage, Mobile Advertising, Mobile Marketing Toolkit, Mobile Marketing Features, Campaign Development Process, Mobile Analytics.

Unit - III

LinkedIn Marketing: Importance of LinkedIn Presence, LinkedIn Strategy, Sales Leads Generation Using LinkedIn, Content Strategy, LinkedIn Analytics, Targeting, Ad Campaign. Twitter Marketing: Getting Started with Twitter, Building a Content Strategy, Twitter Usage, Twitter Ads, Twitter Analytics, Twitter Tools and Tips for Marketers.

Unit - IV

SEO: Search Engine, Concept of Search Engine Optimization (SEO), SEO Phases, On Page Optimization, Off Page Optimization, Social Media Reach, Maintenance.

Unit - V

Web Analytics: Data Collection, Key Metrics, Making Web Analytics Actionable, MultiChannel Attribution, Types of Tracking Codes, Mobile Analytics, Universal Analytics, Competitive Intelligence.

Reference Books:

1. Digital Marketing, Seema Gupta, McGraw Hill Education (India) Private Limited
2. Social Media& Mobile Marketing: Includes Online Worksheets Puneet Singh Bhatia,ISBN: 9788126578078
3. Digital Marketing for Dummies, Ryan Deiss& Russ Henneberry, John Wiley & Son, Inc.
4. Social Media Marketing All-In-One, Jan Zimmerman, Deborah Ng, John Wiley & Sons Inc.
5. Epic Content Marketing, Joe Pulizzi, McGraw Hill Education
6. Youtility, Jay Baer, Gildan Media, LLC
7. Hit Makers : The Science Age of Dice of Popularity in an Age of Distraction, Derek Thompson, Penguin Press
8. The Art of SEO, Eric Enge, Stephan Spencer, Jessie Stricchiola, O'Reilly Media Inc,
9. Digital Marketing 2020, Danny Star,

Ethical Hacking

(BCA603B)

Course Objective:

- Teach students to think like an ethical hacker and at the same time follow the code of professional ethics and the prescribed cyber laws.
- Make oneself aware of the cybercrimes that are taking place in the real world.
- Learn about the different hacking tools and techniques and practically use these tools to gain better understanding of the ethical hacking concepts.
- Provide a deep understanding of security issues, threats and concerns in the cyber world and provide countermeasures to curb hacking.

Course Outcome:

- Recall the networking, sql, and encryption algorithm concepts to further study ethical hacking techniques, threats, tools and
- prevention against attacks.
- Understand ethical hacking concepts, cases, ethics and cyberlaws.
- Apply available hacking tools to find a solution to a given hacking issue.
- Analyze and classify the real-world hacking cases and situations.

UNIT - I

Introduction to ethical Hacking: What is ethical hacking? Types of hacking, advantages, disadvantages and purpose of hacking, Types of hackers, Code of ethics, Types of attacks and attack vector types, Prevention from hackers, The Indian IT Act 2000 and 04Amendments to the Indian IT Act(2008) ,Phases of hacking.

Footprinting and Reconnaissance:What is footprinting? Active and passive footprinting, purpose of footprinting, objectives of footprinting, footprinting threats, Types of footprinting, footprinting countermeasures.

UNIT - II

Scanning networks, Enumeration and sniffing: Scanning networks: Network scanning and its types, objectives of network scanning, scanning live systems, scanning techniques-TCP Connect / Full Open Scan, Types of Stealth scans, port scanning countermeasures, IDS evasion techniques, Banner grabbing and its tools, vulnerability scanning, proxy servers, anonymizers, IP spoofing and its countermeasures.

Enumeration and Sniffing: What is Enumeration? Enumeration techniques, Enumeration types, Enumeration countermeasures, what is sniffing? Wiretrapping and its types, packet sniffing, sniffing threats, how sniffers work?, sniffing methods-ARP spoofing and MAC flooding, active and passive sniffing, types of sniffing attacks, sniffing countermeasures, sniffing detection techniques.

UNIT - III

Trojans and other Attacks: Worms, viruses, Trojans, Types of worms, viruses and worms, Preventing malware attacks, types of attacks: (DoS /DDoS), Waterhole attack, brute force, phishing and fake WAP, Eavesdropping, Man-in-the-middle, buffer overflow, DNS poisoning, ARP poisoning, Identity Theft, IoT Attacks, BOTs and BOTNETs, Steganography - text, image and audio and video, types of Social Engineering: Physical social engineering, Remote social engineering and hybrid social engineering.

UNIT - IV

Hacking web servers, web applications and sql injection: Session hijacking: What is session hijacking? , why session hijacking is successful? session hijacking techniques, session hijacking process, Types of session hijacking, session hijacking countermeasures: protecting and preventing, Hacking web servers and web applications: Causes of webservers being compromised, web server attacks, stages of webserver attacks, defending against web server attacks, web application components, its working, architecture, web server attack vectors, web application threats and counter measures. SQL Injection: What is SQL injection, SQL injection threats, SQL injection attacks, SQLinjection detection, Types of SQL injection, SQL injection methodology, SQL injection prevention and countermeasures.

UNIT - V

Wireless network hacking, cloud computing security, cryptography, Pen testing: Types of wireless Architecture, wireless encryption techniques-WEP and WPA, breaking WEP/WPA and defending WPA encryption, wireless Sniffing, Characteristics, types of cloud computing services, models and benefits, threats and attacks, cryptography and its objectives, cryptography types, cryptography attacks, what is Pen Testing, need for pen testing, types and techniques of pen testing, phases of pen testing.

Reference:

1. Matt Walker, All-In-One-CEH-Certified-Ethical-Hacker-Exam-Guide.
2. Manthan Desai Basics of ethical hacking for beginners.
3. SunitBelapure and Nina Godbole, Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives.
4. Srinivasan, J. Suresh, Cloud Computing: A practical approach for learning and implementation, Pearson.
5. Sean-Philip Oriyano, Sybex, Certified Ethical Hacker Study Guide v9, Study Guide Edition,2016.
6. Emmett Duley and Chuck Easttom ,Comptia Security+ Study Guide.
7. Alana Maurushat, Ethical Hacking.
8. TutorialsPoint Professionals, Ethical Hacking by TutorialsPoint.

IT Security

(BCA603C)

Course Objectives:

- Understand the fundament concepts of Cyber and Information Security
- Gain the knowledge of different types and working of malware and security hazards incident of real-world.
- Understand cryptography techniques and apply them for secure data communication and authentications
- Understand the working and implementation of Firewall.
- Understand the concept of cyberspace and cybercrime and digital signature.

Course Outcomes:

- Explain various security concepts and apply them in daily cyber use.
- Configure firewall and other security setting in computer
- Perform the malware and spam email identification, analysis, virus scanning and cleaning and other services using security tools
- Explain and practice the Cyber Law, Ethics, and Intellectual Property Rights, Patent and Trademark and Design Law

UNIT-I

Information security: overview, information security importance, information security components. Threats to information system- external and internal thread, security threat and vulnerability- overview, malware, type of malware: virus, worms, trojans, rootkits, robots, adware's, spywares, ransom wares, zombies etc., desktop security.

UNIT-II

Application security- database security, e- mail security, internet security, principles of security- confidentiality, integrity, vailability, introduction to cryptography- symmetric key cryptography, asymmetric key cryptography, message authentication, applications of cryptography. Security technology- firewall, type of firewall, firewall benefits, VPN, antivirus software.

UNIT-III

Cyberspace- cloud computing &security, social network sites security, attack preventionpasswords, protection against attacks in social media, securing wireless networks, security threats.

UNIT-IV

Cybercrime-concept of cybercrime, type of cybercrime, phishing, cybercrime prevention, case study, security threats to e- commerce- electronic payment system, Digital Signature– digital signature process.

UNIT-V

ISO- international organization for standardization, world intellectual property organization, cyber law- cyber law in India, IT act 2000, intellectual property rights- definition, intellectual property, categories of intellectual property, rights protected under intellectual property,copyright, patent and trademark, design- design law in India.

References:

- Allan Friedman and P. W. Singer, Cyber Security and Cyber war: What Everyone Needs to Know by Published Oxford University
- Don Franke, Cyber Security Basics: Protect Your Organization by Applying the Fundamentals by Publisher CreateSpace Independent Publishing Platform, 2016
- MayankBhushan, Fundamental of Cyber Security

SOFT SKILLS AND PERSONALITY ENHANCEMENT
(BCA604)

Unit – I

(I)   Team Building – The magic of synergy, characteristics of an effective team, essentials of an effective team, Team Dynamics, Team Leading, Managing a Team.

(II) Art of Negotiation –To understand what is negotiation, Ways of negotiating and being successful in it, To understand the power of language and non-verbal communication.

(III) Grooming –To learn selection of proper attire as per the place, Practiced perception, How to carry one's self,
How to project one's self in the positive frame and spirit.

Unit – II

(I)   Organising Meetings – How to announce, call and organize a meeting in a smooth manner, How to design Agenda and prepare Minutes of Meeting

(II) Telephonic Etiquettes –Learn the tone and pitch of voice while speaking over phone,
How to send a voice mail.

(III) Business Etiquettes –What does business etiquettes mean, Professional and Cultural expectations, Effective writing, Corporate Communication, Interaction with foreign clients.

Unit –III

(I)   Stress Management –Types of stress, Symptoms and causes of Stress, Power of perception, Reaction to stress, Stress Management techniques.

(II) Time Management – Importance of Time Management, Prioritising Tasks, Goal setting, Barriers to Time Management , Planning Routine and Time Tables.

(III) Self Management –Self evaluation, Self discipline, Self criticism, SWOT analysis, Self Awareness, Development of the Self.

Unit – IV

(I)   Presentation Skills –How to prepare a presentation, Knowing the audience and their requirements, Effective ways to deliver presentation, How to prepare Multimedia presentation.

(II) Organisational Skills – How to understand the nature and structure of organisation, To understand hierarchy and communication channel of the organisation, Clarity about the roles and responsibilities in an organisation, How to be a team member, How to draft reports

(III) Leadership Skills

Unit – V

(I)   Group Discussion – Understanding the nature of discussion, Difference between debate and discussion, Ways to form and present arguments, Ways to defend your point.

(II) Personal Interview –To learn the skills of appearing in an interview and being successful in it.

(III) Public Speaking – Art of public speaking, To know the rhetoric of making a public speech, exploring rhetorical elements through various ideas..

(IV) Conference and Meeting, Participation and Technical clarity in conference and meeting, Learning to listen and respond, Final Report drafting.

Reference Books:-

1. Soft Skill for everyone –Jeff Butterfield
2. Soft Skill for-S.I. Hariharan -MJP Publications
3. Personality Development & Soft skill – Goyal Brothers Prakasan

Major Project

(BCA606P)