



**KALINGA  
UNIVERSITY**

**SCHEME & SYLLABUS FOR**

# **Bachelor of Vocational Studies (B. Voc.)**

## **Computer Applications & I.T.**



Kalinga University, Naya Raipur, Chhattisgarh

# EVALUATION SCHEME

## B. VOC-COMPUTER APPLICATIONS & I.T.

Semester-I							
Subject Code	Subject	L	T/P	Credits	Internal Marks	External Marks	Total
BVCAIT101	Communication Skills	3	0	3	30	70	100
BVCAIT102	Fundamentals of Information Technology	3	0	3	30	70	100
BVCAIT103	Statistical Methods	3	0	3	30	70	100
BVCAIT104	Programming for Problem Solving Using C and C++	3	0	3	30	70	100
BVCAIT105P	<b>Industrial Training/ On Job Training/ Workshop</b>	0	36	18	50	150	200
<b>Total</b>		<b>12</b>	<b>36</b>	<b>30</b>	<b>170</b>	<b>430</b>	<b>600</b>

Semester-II							
Subject Code	Subject	L	T/P	Credits	Internal Marks	External Marks	Total
BVCAIT201	Internet & Web Technology	3	0	3	30	70	100
BVCAIT202	Environmental Studies	3	0	3	30	70	100
BVCAIT203	Computer Application in Printing & Graphics	3	0	3	30	70	100
BVCAIT204	Introduction to Database Management System	3	0	3	30	70	100
BVCAIT205P	<b>Industrial Training/ On Job Training/ Workshop</b>	0	36	18	50	150	200
<b>Total</b>		<b>12</b>	<b>36</b>	<b>30</b>	<b>170</b>	<b>430</b>	<b>600</b>

Semester-III							
Subject Code	Subject	L	T/P	Credits	Internal Marks	External Marks	Total
BVCAIT301	Data Structure and Algorithm	4	0	4	30	70	100
BVCAIT302	Object Oriented Programming	4	0	4	30	70	100
BVCAIT303	Software Engineering	4	0	4	30	70	100
BVCAIT304P	<b>Industrial Training/ On Job Training/ Workshop</b>	0	36	18	50	150	200
<b>Total</b>		<b>12</b>	<b>36</b>	<b>30</b>	<b>140</b>	<b>360</b>	<b>500</b>

Semester-IV							
Subject Code	Subject	L	T/P	Credits	Internal Marks	External Marks	Total
BVCAIT401	Operating System	4	0	4	30	70	100
BVCAIT402	Computer Hardware	4	0	4	30	70	100
BVCAIT403	Computer Network	4	0	4	30	70	100
BVCAIT404P	<b>Industrial Training/ On Job Training/ Workshop</b>	0	36	18	50	150	200
<b>Total</b>		<b>12</b>	<b>36</b>	<b>30</b>	<b>140</b>	<b>360</b>	<b>500</b>

Semester-V							
Subject Code	Subject	L	T/P	Credits	Internal Marks	External Marks	Total
BVCAIT501	System Administration Using Linux	4	0	4	30	70	100
BVCAIT502	Android Application Development	4	0	4	30	70	100
BVCAIT503	Database Design & Programming	4	0	4	30	70	100
BVCAIT504P	<b>Industrial Training/ On Job Training/ Workshop</b>	0	36	18	50	150	200
<b>Total</b>		<b>12</b>	<b>36</b>	<b>30</b>	<b>140</b>	<b>360</b>	<b>500</b>

Semester-VI							
Subject Code	Subject	L	T/P	Credits	Internal Marks	External Marks	Total
BVCAIT601	Computer Organization and Architecture	4	0	4	30	70	100
BVCAIT602	Java Programming	4	0	4	30	70	100
BVCAIT603	DTP with Corel Draw	4	0	4	30	70	100
BVCAIT604P	<b>Industrial Training/ On Job Training/ Workshop</b>	0	36	18	50	150	200
<b>Total</b>		<b>12</b>	<b>36</b>	<b>30</b>	<b>140</b>	<b>360</b>	<b>500</b>

# SEMESTER-I

# COMMUNICATION SKILLS

# BVCAIT101

## 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.

## Course outcome:

1. The purpose of this course is to introduce students to the theory, fundamentals and tools of communication
2. To develop vital communication skills which should be integral to personal, social and professional interactions.
3. One of the critical links between human beings.
4. 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.
5. 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:

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:

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:**

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-**

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**

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

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, note taking etc. While, to an extent, the art of communication is natural to all living beings, in today'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.

### **REFERENCE BOOKS:**

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, Dr. Ranjana Kaul, Dr. Brati Biswas

# FUNDAMENTALS OF INFORMATION TECHNOLOGY

## BVCAIT102

### Unit I:

**Computer characteristics:** Speed, storage, accuracy, diligence; Digital signals, Binary System, ASCII; Historic Evolution of Computers; Classification of computers: Microcomputer, Minicomputer, mainframes, Supercomputers; Personal computers: Desktop, Laptops, Palmtop, Tablet; Hardware & Software; Von Neumann model.

### Unit II:

**Hardware:** CPU, Memory, Input devices, output devices. Memory units: RAM (SDRAM, DDR RAM, RDRAM etc. feature wise comparison only); ROM-different types: Flash memory; Auxiliary storage: Magnetic devices, Optical Devices; Floppy, Hard disk, Memory stick, CD, DVD, CD/DVD-Writer; Input devices - keyboard, mouse, scanner, speech input devices, digital camera, Touch screen Voice Input, Joystick, Optical readers, bar code reader; Output devices: Display device, size and resolution; CRT, LCD, LED; Printers: Dot-matrix, Inkjet, Laser; Plotters, Sound cards & speaker.

### Unit III:

**Software:** System software, Application software; concepts of files and folders, Introduction to Operating systems, Different types of operating systems: single user, multitasking, time-sharing multi-user; Booting, POST; Basic features of two GUI operating systems: Windows & Linux (Basic desk top management); Programming Languages, Compiler, Interpreter, Databases; Application software: Generic Features of Word processors, Spread sheets and Presentation software; Generic Introduction to Latex for scientific typesetting; Utilities and their use; Computer Viruses & Protection, Free software, open source.

### Unit IV:

**Computer Networks and Internet:** Connecting computers, Requirements for a network: Server, Workstation, switch, router, network operating systems; Internet: brief history, World Wide Web, Websites, URL, browsers, search engines, search tips; Internet connections: ISP, Dial-up, cable modem, WLL, DSL, leased line Wireless and Wi-Fi connectivity ; email, email software features (send receive, filter, attach, forward, copy, blind copy); characteristics of web-based systems, Web pages, Web Programming Languages.

## Unit V:

**Information Technology And Society:** Indian IT Act, Intellectual Property Rights, issues. Application of information Technology in Railways, Airlines, Banking, Insurance, Inventory Control, Financial systems, Hotel management, Education, Video games, Telephone exchanges, Mobile phones, Information kiosks, special effects in Movies.

**Programming Concepts & Techniques:** Program Concept, Characteristics of Programme, Stages in Program Development, Tips for Program Designing, Programming Aids, Algorithms, Pseudo code, Notations, Design, Flowcharts, Symbols, Rules, compiler & Interpreter. Introduction to programming techniques, Top-down & Bottom-up approach, Unstructured, & Modular programming, Cohesion, Coupling, Debugging, Syntax & Logical Errors, Linking and Loading, Testing and Debugging, Documentation.

## Reference Books:

1. Programming in C, R.S. Salaria, Khanna Publishing House
2. Computer Concepts and Programming in C, R.S. Salaria, Khanna Publishing House
3. Handbook of Computer Fundamentals, N.S. Gill, Khanna Publishing House

# STATISTICAL METHODS

## BVCAIT103

### 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-variogram, 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.

# PROGRAMMING FOR PROBLEM SOLVING

## USING C AND C++

### BVCAIT104

#### 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



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BVCAIT105P**

# SEMESTER-II

## INTERNET & WEB TECHNOLOGY

### BVCAIT201

#### **Unit 1:**

Introduction to internet: Internet, Growth of internet, Anatomy of internet , History of WWW and basic internet terminologies, Browsers, Electronic mail. Internet Applications : Commerce on the internet, Governance on the internet, Impact of internet on society.

#### **Unit 2:**

Internet technology and protocols: What is networks ? Need of computer networks. Characteristics of LAN, MAN,

WAN. A brief idea of OSI reference model and TCP/IP .Difference between OSI and TCP/IP. Physical topologies

( Bus , Ring , Tree , Star , Hybrid etc ..) Logical topologies (protocols) A brief description of Ethernet, FDDI , ATM , Token ring .

#### **Unit 3:**

File transfer protocol: Introduction to FTP & terminologies, FTP servers and authentication, GUI based FTP clients,

Browser based FTP clients.

#### **Unit 4:**

Internet management security concepts: Overview of internet security, Firewalls. Internet security management concepts & information. Privacy & copyright issues.

#### **Unit 5:**

HTML: Introduction to HTML, basics & elements of HTML, attributes, headings, paragraphs, links, Images, Lists, Tables, Forms, Frames. Client side scripting: Introduction to JavaScript & its basics, data

types, variables operators, functions looping, objects, arrays, strings. Server side scripting: Introduction to PHP, basic programming principles & database connectivity.

**Suggested Reading :**

1. HTML & XML an Introduction. PHI .
2. A. S. Godbole, A. Kahate; Web Technologies; Tata McGraw-hill;
3. Andrew S. Tanenbaum; Computer Network; PHI; (Fourth Edition);

# ENVIRONMENTAL STUDIES

## BVCAIT202

### Unit 1 : Introduction to Environmental Studies

- 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

- Land resources and land use 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

- 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**

- 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**

- 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.

# COMPUTER APPLICATION IN PRINTING & GRAPHICS

## BVCAIT203

**Unit I:** Introduction to DTP, trends in printing technology, usage of computers in printing. DTP printing technology. Introduction to DTP software's, Use of Text tool Adobe, Photoshop Corel Draw. Story editing, formatting.

**Unit II:** Working with graphics: using different graphic tools importing graphics working with colour, table editing. Desk Top Publishing Hardware, Macintosh, Cost estimation of DTP.

### **Unit III:** Graphics

Definitions – Print Design Vs Digital Design – Elements of Graphic Design – Tools of Organization – Architecture of Type/Font – Building Blocks of Graphic Design: Whitespace, Rules, Borders, Boxes, Shadows, Bleeds – Illustrations – Working with Photographs – Working with Color Designing for Print: Newsletters – Newspapers – Magazines – Brochures – Pamphlets – Posters

### **Unit IV:** Animation

Definition – Types of Animation: Cel Animation, Stop Motion Animation, Computer Animation, Frame by Frame, Keyframe Animation – Applications – Hardware – Software – Considerations for selecting tool Animation Techniques: Transformation – Compositing – Color Correction – Modeling – Lighting – Masking – Layering – Shading – Particles

**Unit V:** Rendering and Career Prospects Rendering: Types – Features – Techniques – Real-Time Rendering – Software Creators: Visual Development artist, Layout artist, Character animator, Cleanup artist, Color stylist, Graphic Designer, Animator, Effects animator, Composer Image Processing Raster Graphics – Vector Graphics – Image File Formats: Windows Formats, Macintosh Formats, Cross Platform Formats – Audio & Video File formats – Audio & Video Streaming Formats – Graphics and Animation for Web – Web File

Formats – CODEC: LossyVs Lossless, Compression Techniques

# INTRODUCTION TO DATABASE MANAGEMENT SYSTEM

## BVCAIT204

### Unit 1:

File Structure: Record storage and primary file organization: memory hierarchies and storage devices, Storage of DataBases, Placing file records on disks: Records and its Types, Files, Fixed length records and variable length records, Record Blocking, allocating file blocks on disks, operation on files. Issues in Physical Design : Concept of indexes

### Unit 2:

Overview of Database Management System: Definition of DataBase, Traditional File Approach vs. DBMS approach, Characteristics of the Data Base Approach, DBMS user, Role of a DBA, Advantage of using DBMS, DBMS architecture, Data independence ANSI/SPARC 3 level architecture.

### Unit 3:

Relational Models: Fundamental integrity rules: entity integrity, referential integrity, Relational algebra(Select, Project, Cross ,Product , theta join, equi join, natural join, outer join ),Set Operation ANSI SQL –92 Standard: DDL, DML, SQL constructs(Select .. From...Where... Group by ..... Having... Order by...), Insert, Delete, Update, View, Definition and use, nested quires, Constraints considers(NOT NULL, UNIQUE, Check Primary key. Foreign key)

### Unit 4:

Database Design: Conceptual model, logical model, physical model.ER model as a tool for conceptual design-entities, attributes and relationships, weak and strong entities, conversion of ER model into relational schema. DFD.Normalization: informal design guidelines for relational schemas (overview level), functional dependencies, different types of keys. Normal forms (first, second, third, BCNF). Functional dependency diagram and design of relational database from it.

### Suggested Reading:

1. Introduction to database management system, C.J. Date
2. Fundamentals of data base management system, Elmasri&Navathe
3. An introduction to Database systems; Bipin C. Desai; Galgotia publications.
4. Database Systems - Concept, Design and Applications; S.K.Singh; Pearson Education.

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BVCAIT205P**

# SEMESTER-III

# DATA STRUCTURE AND ALGORITHM

# BVCAIT301

## **UNIT I: Introduction to data structure**

Basic concept, Abstract data types, Fundamental and derived data types. Representation, primitive data structures.

## **UNIT II: Arrays**

Single and multidimensional arrays. Address calculation using column and row major ordering. Various operations on Arrays. Matrix multiplication.

## **UNIT III: Stack and queues**

Representation of stacks and queue using arrays and linked-list. Circular queues. Applications of stacks Conversion from infix to postfix and prefix expressions, postfix evaluation algorithm

## **UNIT IV: Linked lists**

Singly linked list; operations on Linked-list . Circular linked lists, Doubly linked lists.

## **UNIT V: Trees**

Basic terminology, Binary tree traversal methods - Preorder, Inorder and Postorder . Application of binary tree, Binary search tree, insertion and search operations on binary search tree.

## **Searching and sorting:-**

Searching: Sequential and binary searches. Sorting - Insertion, selection, bubble, quick, merge, radix.

### **Graphs:-**

Definition of Graph, Graph terminology, Directed, Undirected & Weighted graphs. Graph representation: Adjacency matrix, Adjacency lists.

### **BOOKS RECOMMENDED :**

1. Robert L. Kruse; Data Structures and Program Design; Prentice Hall, 1987. (Second Edition).
2. A. S. Tanenbaum; Data Structure using C; PHI.
3. H. Sahani; Fundamentals of Data Structure in C; Orient Publications. (Second Edition).

# OBJECT ORIENTED PROGRAMMING

## BVCAIT302

### UNIT I:

#### Principles of Object Oriented Programming:-

- 1.1 Basic concept of OOP,
- 1.2 Procedural programming vs OOP
- 1.3 Advantages of OOP, OOP languages
- 1.4 Concept of Class, Objects, Concept of Inheritance and encapsulation,
- 1.5 Operator overloading, Dynamic Binding.
- 1.6 Overview of OPP using C++,
- 1.7 Basic program construction.

#### Elements of C++ Language:-

- 2.1 Keywords and Identifiers in C++
- 2.2 Variables and Constants,
- 2.3 Declaration and Initialization of Variables,
- 2.4 Concept of Dynamic Initialization of variables, Enumerated variables,
- 2.5 Basic Data Types,
- 2.6 Arrays and Strings, User Defined Data types,
- 2.7 Arithmetic, Relational, Logical Operators and Operator Precedence
- 2.8 Manipulators, Type Conversions and type cast operators
- 2.9 Console I/O: cin, cout functions.
- 2.10 Control Statements.-if; if-else; else....if; switch statements
- 2.11 Loops: for, while, do-while, Break, continue, go to

### UNIT II:

#### Functions:-

- 3.1 Syntax of a Function.

3.2 Function Prototype, Calling function, Function definition

3.3 Passing arguments and returning values.

3.4 Pass by value, pass by reference.

3.5 Passing and returning structure variables

3.6 Inline and overloaded function

3.7 Default arguments, returning by reference.

### **Classes and Object:-**

4.1 Definition and Declaration of a Class

4.2 Declaration of members.

4.3 Declaration of objects

4.4 Objects as function arguments.

4.5 Array of objects.

4.6 Returning objects from function.

4.7 Structures and classes.

### **UNIT III:**

#### **Constructors and Destructors:-**

5.1 Concept of constructors. Types of constructors. Parameterized constructor, Constructor with default arguments, Copy constructors

5.2 Dynamic Initialization of Objects .

5.3 Concept of Destructors.

#### **Operator Overloading:-**

6.1 Concept of Operator Overloading

6.2 Unary and Binary Operators.

6.3 Overloading of unary and binary operators.

### **UNIT IV:**

#### **Derived Classes and Inheritance:-**

- 7.1 Concept of inheritance
- 7.2 Derived and Base Class- Definition and Declaration.
- 7.3 Types of Inheritance.
- 7.4 Public, Private and Protected Access
- 7.5 Constructors in Derives Classes

#### **UNIT V:**

##### **Pointer:-**

- 8.1. Pointer Basics.
- 8.2. Address Operator and Pointer Variables.
- 8.3. Pointer Arithmetic.
- 8.4. New And Delete Operator
- 8.5. Null Pointer.
- 8.6. Reference and Constant pointer.
- 8.7. Array of Pointers.
- 8.8. Pointers to Object and Pointers to Pointer.

##### **Virtual Function & Polymorphism:-**

- 9.1 Pointers to Derived Objects and Virtual Functions.
- 9.2 Early binding vs. Late binding.
- 9.3 Abstract Classes and Pure Virtual Function.

##### **Suggested Readings::**

1. Robert Laffore; Object Oriented Programming in Turbo C++; Galgotia Publication,1996; (Fourth Edition).
2. E. Balaguruswamy; Object Oriented Programming with C++;Tata McGrahill, 1997; (Third Edition) ;
3. Yashavant Kanitkar; Visual C++ Programming; BPB Publications,1998.
4. S.B. Lippman; C++ Primer; Addison Wesley, 1995 ; (Third Edition).
5. Stastroup; The Elements of C++ Programming; Addison Weiley Publication, 1995.

# SOFTWARE ENGINEERING

## BVCAIT303

### **UNIT I:** Introduction

Software Processes & Characteristics, Software life cycle Models ---- Waterfall, Prototype, Evolutionary and Spiral Models Software Requirements analysis & specifications: Requirement engineering, requirement, elicitation techniques like FAST, QFD, requirements analysis using DFD, Data dictionaries, ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS.

### **UNIT II:** Software Project Planning

Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, Risk Management.

### **UNIT III:** Software Design

Data design, Architectural design, Interface design, Function Oriented Design, Object Oriented Design, Cohesion & Coupling, Classification of Cohesiveness & Coupling, Software Metrics: different types of project matrices.

### **UNIT IV:** Software Testing and Maintenance

Testing Process, Design of Test Cases, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing. Debugging Activities Software Maintenance: Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation. Software quality Assurance. CASE tools--- Analysis tools, design tools, SQA tools, software testing tools.

### **Suggested Readings:**

1. Rajeev Mall —Software Engineering|| PHI
2. Pressman Roger — Software Engineering A Practitioners Approach|| Tata McGraw Hill
3. James F. Peters, Witold Pedrycz —Software Engineering An Engineering Approach



# **INDUSTRIAL TRAINING/ ON JOB TRAINING/ WORKSHOP BVCAIT304P**

# SEMESTER-IV

# OPERATING SYSTEM

# BVCAIT401

## **UNIT I: Introduction:**

What is an operating system, batch systems, multiprogrammed, time-sharing systems, personal-computer systems, parallel systems, distributed systems, real-time systems.

### **Processes: -**

Process Concept, Thread, design issues of thread, user space thread and kernel space thread. Usage of thread. Process states, Operation on Processes:- creation and termination. Implementation of process:- process table.

## **UNIT II: Process Synchronization:**

Race condition, Critical-Section, mutual exclusion. Solution to race condition and synchronization: - disabling interrupt, test-and-set-lock, Peterson's solution, semaphore, mutex, monitor, message passing. Classical problems:- The Dining philosopher, sleeping barber and readers-and-writers (bounded buffer) problems and their solution.

## **UNIT III: Scheduling**

Basic Concepts, preemptive and non preemptive scheduling. Scheduling Algorithms. Types of scheduling: - batch, interactive and real-time. Goals of scheduling algorithms. FCFS, SJF, RR, priority, multiple queues, three-level scheduling.

## **UNIT IV: Deadlocks:**

System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock. Banker's algorithm.

### **Memory management: -**

Multiprogramming. Address binding (relocation), and protection. Swapping. Virtual memory: - logical versus physical address space, paging, page fault, page table and its entries, demand paging, multi level page table, TLB, its entries and working. Page replacement algorithms: - LRU, optimal, NRU, FIFO, second chance, clock, NFU. Working set. What is segmentation, what are its benefits and drawbacks.

### **UNIT V: File system**

What is file, file naming, file types(directory, regular, device), sequential access and random access files, file attributes, operations on file, hierarchical directory structure, path name(relative and absolute), operation on directories, disk layout, disk partition, file system layout, disk block allocation:-contiguous allocation linked list allocation, FAT, i-nodes, directories in UNIX, file system security

### **I/O management:-**

Basic principles and overall structure of I/O management subsystem, Device controllers, layers of the I/O subsystem:- interrupt handlers device driver, device independent I/O software and user space I/O software.

### **Suggested reading:**

1. Modern Operating System, Tanenbaum, PHI Publication.
2. Operating System by Galvin

# COMPUTER HARDWARE

## BVCAIT402

### UNIT-I

Physical Layer : Data communications : components – Network criteria – physical structures – network models – categories of networks – interconnection of networks – inter network Protocols and standards : protocols-standards-standards organizations- internet standards Network models: Layered tasks – OSI model – layers in the OSI model – TCP/IP protocol suite.

### UNIT – II

Digital Transmission: Digital to digital conversion: Line coding – line coding schemes – block coding - analog to digital conversion – PCM - transmission modes: serial transmission – parallel transmission Analog Transmission: Digital to analog conversion: FSK-ASK-PSK Analog to Analog conversion: Amplitude modulation – Frequency modulation – phase modulation Multiplexing: Frequency division multiplexing – Time division multiplexing – Transmission Media Guided media: Twisted pair cable – coaxial cable – fiber optic cable Unguided media: radio waves - micro waves – infrared.

### UNIT-III

Data Link Layer: Error correction and detection: Introduction- block coding-linear block codescyclic codes-checksum. Data link Control: protocols-simplest protocol- stop and wait protocol- stop and wait automatic repeat request-go back n automatic repeat request-selective repeat-automatic repeat request-piggybacking. Multiple Access: Random access-Aloha-CSMA-CSMA/CD-CSMA/CA Controlled access: reservation, polling, token passing. Channelization: FDMA,TDMA, CDMA.

### UNIT-IV

Wired LANs: Ethernet: IEEE standards, standard Ethernet- fast Ethernet. Wireless LANS: IEEE 802.11-architecture-MAC sublayer addressing mechanism, physical layer-Bluetooth: architecture-Bluetooth layers-radio layer-baseband layer-L2CAP-other upper layers. Network Layer: Addressing IPv4 addresses - IPv6 Addresses Internet Protocol: IPv4 –IPv6 Address mapping protocols: ARP – RARP.

### UNIT-V

Routing protocols: Unicast routing protocols: distance vector routing, Link State routing Multicast Routing protocols (Any two) Transport Layer: Process to process delivery – UDP – TCP Congestion control and QOS:Data traffic – congestion – congestion control – quality of service – techniques to improve quality of service.

### **Application layer: & Network Security :-**

DNS: Name space – domain name space – distribution of name space Electronic mail Architecture – FILE transfer: FTP WWW and HTTP: Architecture – web documents – HTTP Network Security: Introduction - definitions – two categories - symmetric key cryptography – traditional ciphers – asymmetric key cryptography

### **SUGGESTED READINGS :**

1. Behrouz A Forouzan, Data communication and networking, McGraw-Hill, 5

# COMPUTER NETWORK

## BVCAIT403

### UNIT-I

Physical Layer : Data communications : components – Network criteria – physical structures – network models – categories of networks –interconnection of networks – inter network Protocols and standards : protocols-standards-standards organizations- internet standards Network models: Layered tasks – OSI model – layers in the OSI model – TCP/IP protocol suite.

### UNIT – II

Digital Transmission: Digital to digital conversion: Line coding – line coding schemes – block coding - analog to digital conversion – PCM - transmission modes: serial transmission – parallel transmission Analog Transmission: Digital to analog conversion: FSK-ASK-PSK Analog to Analog conversion: Amplitude modulation – Frequency modulation – phase modulation Multiplexing: Frequency division multiplexing – Time division multiplexing – Transmission Media Guided media: Twisted pair cable – coaxial cable – fiber optic cable Unguided media: radio waves - micro waves – infrared.

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### UNIT-IV

Wired LANs: Ethernet: IEEE standards, standard Ethernet- fast Ethernet. Wireless LANS: IEEE 802.11-architecture-MAC sublayer addressing mechanism, physical layer-Bluetooth: architecture-Bluetooth layers-radio layer-baseband layer-L2CAP-other upper layers. Network Layer: AddressingIPV4 addresses - IPV6 Addresses

Internet Protocol: IPv4 –IPv6 Address mapping protocols: ARP – RARP.

## **UNIT-V**

Routing protocols: Unicast routing protocols: distance vector routing, Link State routing Multicast Routing protocols (Any two) Transport Layer: Process to process delivery – UDP – TCP Congestion control and QOS:Data traffic – congestion – congestion control – quality of service – techniques to improve quality of service.

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### **SUGGESTED READINGS:**

1. Behrouz A Forouzan, Data communication and networking, McGraw-Hill, 5

**INDUSTRIAL TRAINING/  
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BVCAIT404P**

# SEMESTER-V

## SYSTEM ADMINISTRATION USING LINUX

### BVCAIT501

#### **Unit I :**

What is System Administration? Duties of a System Administrator. Basic features of the Linux operating system. Installation requirements, Partitioning the Hard drive in Linux, Installing the Linux system, installing and configuring softwares in linux, Linux kernel program, system Startup and Shutdown. Standard I/O, Standard error, redirection and piping.

#### **Unit II :**

Basics of Linux file system: hierarchy and types. absolute and relative path names. Basic commands for files and directories- ls, cp, mv, rm, mkdir, rmdir, more, creating and viewing files, mounting and unmounting file systems and partitions. Structure of /etc/fstab file and its purpose. l-node, directories, hard link, symbolic link. setting user and group ownership of files and access permissions, study of different linux shells (sh, bash, csh, zsh). Environment variable. Bash variables, login vs non-login shells. Shell script basics. Introduction to grep, awk, perl )

#### **Unit III :**

Basic commands for starting and stopping processes, basic process attributes and their role in access control. Examining the list of running processes on the system and understand the data presented there. Background process, Sending signals to processes and modifying process priorities. Job control. Crontab file format, Backup and Restore procedure, configuring the print queue, selecting the printer driver, editing the printer configuration, deleting printer setting default printer.

#### **Unit IV :**

Managing user accounts: Adding a user, password, Creating Groups, adding and deleting groups, viewing user account information, understanding the "root" account, implementing sudo. What is file ownership and access permission,, System monitoring and logging, Monitoring memory usage, disk space usage and I/O activity. Logging and its necessity, Customizing system Log information.

## **Unit V:**

The rules governing IP address classes and netmasks, Network Address, Netmask and Gateway. configuring Interface with ifconfig, adding routes, ping, netstat, traceroute, telnet, Understanding the significance of the /etc/services file and well known port numbers. Basics of configuring NFS, NIS, DNS, FTP, Squid Proxy, DHCP server, iptables and firewall. Basic Network Security Issues.

## **Suggested Readings**

1. Red Hat Linux: Proffitt: PHI
2. Introduction to system Administration: IBM series: PHI
3. Essential System Administration: Frisch: O'REILLY

# ANDROID APPLICATION DEVELOPMENT

## BVCAIT502

### UNIT 1:

- Introduction to Android. Smartphone features.
- Installing the SDK. Creating Android Emulator. Installing Eclipse. Installing Android development tools. Choosing which Android version to use.

### UNIT 2:

- Android Life cycle. Android applications structure.
- Creating a project. Working with android manifest.XML Various controls. Layouts

### UNIT 3:

- Text controls
- Button controls
- Images
- Supporting Multiple Screen
- Activities.
- Application context.
- Intent
- WebView.

### UNIT 4:

- List View.
- Spinner
- AutoComplete Textview.
- Multi Auto Complete Textview.
- Toast.

- Dialogue Notification.
- Statusbar Notification.

#### UNIT 5:

- Option Menu.
- Context Menu.
- Google Map.
- File . Shared Preferences. Database (SQLite database) ,Creation of .apk files.
- Web services. HTTP client.
- XML and JSON.

# DATABASE DESIGN & PROGRAMMING

## BVCAIT503

### UNIT I: Introduction to database design

Software development life cycle (software development cost, structures system analysis and design, structured system analysis, structured design ), Database development life cycle(DDLC), Database design approach (Bottom-up, top-down, inside-out, mixed strategy). Phases of database design – Data requirement collection & analysis, conceptual database design, DBMS selection, logical & physical database design, prototyping, database implementation and tuning .

### UNIT II: DBMS architecture

Centralized DBMS architecture, Basic client server architecture. Two-tier client server architecture, Three tier client/server architecture for web application. Issues in application development : Transaction concepts (execution and problems) Concurrency control (problems, degree of consistency, permutable action, schedule, serializable schedules, locking methods for concurrency control.

### UNIT III: Database security

Introduction, goals of database security. Discretionary access control (Granting /Revoking privileges, Audit trials), Mandatory access control, Firewalls, Authorization and authentication.

### UNIT IV: Introduction to SQL and database programming

Specifying constraints, Complex SQL queries, views (virtual tables in SQL), concept of cursor and triggers. Stored procedure, transactions and cursors. Issues and techniques, Approaches to database programming. Typical sequence of interaction in database programming. Embedded SQL, Dynamic SQL and SQLJ: Retrieving single tuple with embedded SQL, Retrieving multiple tuples with embedded SQL using Cursors , Specifying queries at runtime using dynamic SQL, Embedding SQL commands in JAVA, Retrieving multiple tuples in SQLJ using Iterators. Database programming with function calls SQL/CLI and JDBC:SQL function calls for JAVA programming.

### Suggested Readings:

1. Fundamentals of database management system by Elmasri and Navathe, Pearson Ed.
2. MySql for professionals by Ivan Bayross
3. Database System Concepts by Silberschatz, Korth and Sudarshan, Mc-Graw Hill.

**INDUSTRIAL TRAINING/  
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BVCAIT504P**

# SEMESTER-VI

## COMPUTER ORGANIZATION AND ARCHITECTURE

### BVCAIT601

#### Unit – I

##### Introduction

Functional units of a computer, basic instructions (zero, one, two, three address), bus structure, memory locations, memory addresses, memory operations, instruction and instruction sequencing (straight line sequencing and branching). Addressing modes, stack, subroutine, I/O instructions.

#### Unit – II

##### Register Transfer Logic

Introduction, inter register transfer, arithmetic micro-operation, logic micro-operation, shift micro operation, Conditional control statements, fixed point binary data, instruction code, design of a simple computer.

#### Unit – III

##### Processor Logic Design

Processor organization, design of arithmetic and logic circuit, status register, design of accumulator.

#### Unit – IV

##### Control Logic Design

Hardware control, micro-programmed control block diagram.

#### Unit – V

##### I/O Subsystem

Program controlled I/O, Interrupts: enabling and disabling interrupts, handling interrupts from multiple sources (priority control), DMA.

#### **Memory Subsystem**

Semiconductor memory, SRAM, DRAM, ROM types, Cache memory, Flash memory, mapping functions.

# JAVA PROGRAMMING

## BVCAIT602

### Unit I

#### JAVA language basics

Basic features, Java virtual machine concepts Creation of JAVA, executing a java program using command line arguments The primitive data types and Variables, Java Key words, integer and floating point data type, character and Boolean types, declaring and initialization variables, Type conversion and casting

### Unit II

#### Operators and Control Statements

Java operators - Arithmetic operators, Bitwise operators, Relational operators, Boolean logical operators, Assignment operator, Conditional operator, if and switch statements, iteration statements, jump statements.

### Unit III

#### Classes and Methods

Class fundamentals, Objects, Constructors, this keyword, finalize () method Overloading methods, garbage collection, Returning objects, introducing access control, understanding static, introducing final, introducing nested and inner classes Strings String operations, Character Extraction, Comparing, Searching & Modifying the strings, Data conversion using valueOf(), String Buffer

### Unit IV

#### Inheritance

Inheritance basics, using super, creating a multilevel hierarchy, method overriding, dynamic method dispatch, using abstract classes, using final with inheritance Packages and interfaces Packages, access protection, importing packages, interfaces Multithread programming The JAVA thread model, creating a thread, creating a multiple thread, Using isAlive() and join (), Interthread communication, suspending, resuming and stopping threads, using multithreading.

## Unit V

### Exception handling

Exception handling fundamentals, exception types, uncaught exceptions, using try and catch, multiple catch clauses, nested try statements, throw, throws, finally, Java's built-in exceptions,

### Input/output:-

Java I/O classes and interfaces, file, the stream classes, byte streams, character streams, console class.

### Applet class:-

Applet basics, applet architecture, simple applet skeleton, applet displaying methods,

### Event handling:-

Two event handling mechanisms, delegation event model, event classes, source of events, event listener interface

# DTP WITH COREL DRAW

## BVCAIT603

### **Unit 1: Getting Started with Corel DRAW**

Case Study: Visiting Card

Understanding the Color Palette

Case Study: Sticker

Case Study: Letterhead with Logo

### **Unit 2: Working with the Objects**

Case Study: Wedding Card

Case Study: Flex Banner

### **Unit 3: Understanding other controls (Layers and Tables)**

Case Study: Flyer with Coupon

Case Study: Brochure

### **Unit 4: Other Features**

Case Study: Product Box Package

Case Study: Book Cover

Case Study: Newspaper advertising

Case Study: Magazine Inner page

**INDUSTRIAL TRAINING/  
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