

# **Faculty of Engineering & Technology**

Study and Evaluation Scheme

of

**Diploma (Engineering)**

**Diploma (Computer Science and Engineering)**

(Applicable w.e.f Academic Session 2022 till revised)



**AKS UNIVERSITY, SATNA**

Study and Evaluation Scheme

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**Department of Computer Science and Engineering**  
**Faculty of Engineering & Technology**

Scheme of  
**Diploma (Computer Science and Engineering)**

**Teaching and Examination Scheme Diploma-III**

S. N.	Subject Code	Subject Name	L	T	P	Credit
1	16CSE301	Programming in C	4			4
2	16CSE302	Discrete Structure	4			4
3	16CSE303	Operating System	4			4
4	16CSE304	Hardware Installation and Maintenance	4			4
5	16CSE305	Internet and Cyber Security	4			4
6	16CSE351	<b>Programming in C – LAB</b>			2	1
7	16CSE352	<b>Hardware Installation &amp; Maintenance LAB</b>			2	1
			20		6	22

**Teaching and Examination Scheme Diploma-IV**

S. N.	Subject Code	Subject Name	L	T	P	Credit
1	16CSE401	OOP with C++ Programming	3	1		4
2	16CSE402	Multimedia Tools and Applications	4			4
3	16CSE403	Data Structure using C	4			4
4	16CSE404	Web Technology	3	1		4
5	16CSE405	Accounting with Tally	3	1		4
6	16CSE451	<b>OOP with C++ Programming-LAB</b>			2	1
7	16CSE452	<b>Data Structure and Multimedia - LAB</b>			2	1
8	16CSE453	<b>Project using Web Technologies–LAB</b>			2	1
			<b>17</b>	<b>3</b>	<b>7</b>	<b>23</b>
9		<b>Practical Training and Assessment</b>	During IV and V Sem break, Marks to be awarded in V Semester			

**Total Credit=24**

**Department of Computer Science and Engineering**  
**Faculty of Engineering & Technology**  
**Diploma (Computer Science and Engineering)**

**Teaching and Examination Scheme Diploma-V**

S. N.	Subject Code	Subject Name	L	T	P	Credit
1	16CSE501	JAVA Programming	4			4
2	16CSE502	Database Management System	4			4
3	16CSE503	Computer System Organization	4			4
4	16CSE504	Computer Network	4			4
5	16CSE505	Entrepreneurship Development	2			2
6	16CSE551	<b>Semester Break Training Report Submission</b>			4	2
7	16CSE552	JAVA Programming – LAB			2	1
8	16CSE553	DBMS – LAB			2	1
			16		8	22

**Total Credit=22**

**Teaching and Examination Scheme Diploma-VI**

S. N.	Subject Code	Subject Name	L	T	P	Credit
1	16CSE601	Current Trends and Technologies	4			4
2	16CSE602	E- Commerce and E-Governance	4			4
3	16CSE603	.NET Technologies	4			4
4	16CSE604	Linux and Shell Programming	4			4
5	<b>Elective (Choose any one)</b>		4			4
	16CSE605-A	Python Programming				
	16CSE605-B	Cloud Computing				
6	16CSE651	.NET – LAB			2	1
7	16CSE652	Current Trends and Technologies (LAB)			2	1
8	16CSE653	PROJECT - LAB			4	2
			16		8	24

**Total Credit=24**

# PROGRAMMING IN C

## UNIT-I

**Introduction:** Keywords, Data Types, Variables, Constants, Declaring, Defining and Initializing Variables, Scope of Variables, **Operators:** (Arithmetic, Relational, Logical, Conditional, Assignment, Increment/Decrement, Bitwise), Formatted and Console I/O- printf(), scanf(), Header Files (stdio.h, conio.h etc).

## UNIT-II

**Control-Structure:** Conditional control structures (simple if, else if, else if else ladder, and switch-case) Looping control structures (while, do-while, and for loops), Nested control structures. **Function:** Call by Value, Call by Reference, Functions returning value, Return data type of functions, Functions parameters, Differentiating between Declaration and Definition of Functions, Command Line Arguments/Parameters in Functions.

## UNIT-III

**Array:** One-Dimensional Arrays- Declaring and Defining an Array, Initializing an Array, Accessing individual elements in an Array, Manipulating array elements using loops. Data types of arrays- integer, float, and character arrays / Strings. Two Dimensional Arrays-Declaring, Defining and Initializing Two-Dimensional Array, Working with Rows and Columns. Introduction to Multi-Dimensional Arrays.

## UNIT-IV

**Pointer:** Declaring pointers to simple variables, pointers to pointers, pointers to structures, problems with pointers, passing pointers as function arguments, returning a pointer from a function, using arrays as pointers, passing arrays to functions.

**Structure and Union:** Understanding utility of structures and unions, array of structures, individual data members as structures, passing and returning structures.

## UNIT-V

**File-Handling:** Opening and closing a file, reading and writing text files, random access in files,

**Pre-Processor Directives:** (#include, #define, #if, #else, #ifdef, #ifndef and #undef),

**Macro:** Declaring and using simple macros.

### Text Books:

1. The Complete Reference 'C' Tata Mc Graw Hill Fourth Edition Herbert Schildt
2. Reference Books: 1. Programming Language in 'C' Gotfried Tata MC Graw Hill. 2. Let Us C, Yashwant Kanitkar

# DISCRETE STRUCTURE

## UNIT-I

**Set-Theory:** Set and Subset, Types of Set, Equal Sets, Universal Sets, Finite Set and Infinite Set, Union, Intersection and Complement of Sets, Cartesian Product, Venn Diagram, Commutative Law, Associative Laws, Distributive Laws, De-Morgan's Laws.

## UNIT-II

**Function:** Domain and Range, Types of Relation Onto function, Into function, and One-One Function, Composite function, and Inverse Function.

## UNIT-III

**Logic:** Proposition, First Order Logic, Basic Logic Operation, Logical Equivalence, Truth Table, Predicates and Quantifiers, Boolean Algebra, Logic Gates.

## UNIT-IV

**Graph:** Graph and Subgraph, Bi-Partite Graph, Isomorphic Graph, Homo-Morphic Graphs, Weighted Graphs, Shortest Paths in weighed graphs (Dijkstra's algorithm), Operations on Graphs, Directed Graph, Matrix Representation on Graphs, Cyclic Graphs.

## UNIT-V

**Tree:** Rooted Tree, Labelled Graph, Weighted Graph, Decision trees or Sorting Tree, Spanning Tree, Binary Trees, Algorithms- Prim's, Kruskal.

### Text Book:

1. C.L. Liu & Mahopatra, Elements of Discrete mathematics, 2nd Sub Edition 1985, Tata McGraw Hill

### Recommended Books:

1. Rosen, Discrete Mathematics and Its Applications, Sixth Edition 2006

# OPERATING SYSTEM

## UNIT-I

**Introduction:** Operating system concept, system calls, types of system calls, operating system architecture, operating system services. Batch systems, Time sharing systems, Parallel systems, Distributed Systems, Real time Systems, multitasking, Client-server system.

## UNIT-II

**Process and Thread:** Process concept, process scheduling, operation on processes, inter-process communication. Thread concept, multithreading, context switching, scheduling criteria, types of scheduling, long term, short-term, medium-term scheduling.

## UNIT-III

**Deadlock:** Definition, characterization, handling of deadlock, deadlock prevention, avoidance, detection and recovery.

## UNIT-IV

**Memory- Management:** Logical Vs. Physical Address Space, swapping, contiguous allocation, paging, segmentation, virtual memory, demand paging, page replacement, thrashing.

## UNIT-V

**Secondary- Storage:** Disk structure, disk scheduling, disk management, disk reliability.

**File:** Attributes of file, types of file, directory structure, file access control, allocation methods.

**Case Study:** Windows Vs Linux

### Text Books

1. Silberschatz and Galvin, Operating System Concepts 6/ed, Addison Wesley.

### Reference Books:

1. William Stalling, Operating Systems: Internals and Design Principles 5/ed, PHI.

# HARDWARE INSTALLATION AND MAINTENANCE

## UNIT-I

**Installation:** Assembling and installation information on computer, system architecture, trouble shooting and managing systems, installations of operating systems, configuring network, installation of service packs, applications such as MS-Office, Anti-virus software, trouble shooting of Windows XP & MS Office.

## UNIT-II

**Mother-Board:** Types of mother board, form factor, different components of mother boards (I/O slots, I/O connectors, CMOS battery, RTC, memory socket, BIOS, front panel connectors), types of buses, compatibility with the processor, SATA interface.

## UNIT-III

**Resources:** Memory address, I/O address, resource conflict, IRQ, DMA. **CMOS:** Utility Concept, CMOS RAM, CMOS Battery, backup, CMOS Utility Program menu, clearing CMOS.

## UNIT-IV

**Card and Connector:** Add on cards, cables & connectors, AGP, PCI Express, TV Tuner Card, DVR card, Video Capture, SCSI, USB, NIC, Fire wire, Internal Modem, Sound Card. Display Systems Types of VDU, (CRT, LCD, TFT), Power Consumption, Durability, Specification, Installation.

## UNIT-V

**Disk Drive:** Types, capacity, component (Media, R/W Head, Spindle Motor Head Actuator) connectors, configuration of HDD in, CMOS, BIOS setup, jumper setting, partitioning, formatting, preventive Maintenance, troubleshooting (H/W, S/W Recovery, Zero fill) Administering Users and Groups, Administering Printers, Optical Disk Drive (ROM, R/W, DVDROM, DVD R/W), Backup Drive (Pen Drive U3 format, Zip Drive, Tape Drive, USB External Drive -HDD, CD/DVD writer)

## References

1. V.R. Mehta, Principal of Electronics, S. Chand & Co
2. Malvino & Leach, Digital Principals & Applications
3. Maintaining & Repairing PC's, Tata McGraw Hill
4. Mark Minasi, The Complete PC Upgrade & Maintenance Guide, BPB Publication
5. SD. Balasubramaniam, Computer Installation & Servicing Pearson Education

# INTERNET AND CYBER SECURITY

## UNIT-I

**Internet:** Introduction, www, Domain-Name, Services, Email, Protocol. **Cyber-Security:** Principles, threats and attack techniques, cyber security policy, information security, confidential, integrity, availability, security threats and attacks, Weak /Strong Passwords and Password Cracking, Insecure Network connections, Phishing, Identity-Theft, Botnet.

## UNIT-II

**Authentication:** Identification, Authentication, Authentication by passwords, Access control structures, Types of access control. **Network Security:** Cryptographic mechanisms, Digital signatures, Encryption, digital signature certification, suspension and revocation of digital signature certificate.

## UNIT-III

**Protection Measures:** Business risk analysis, Prevention, detection and response, security policies, security procedures and guidelines, business continuity and disaster recovery. Legal and Ethical Issues: Protection of data and Information Laws, Software failure, Computer Crime, Privacy, and Ethics

## UNIT-IV

**Cyber-Crime:** Cyber Governance Issues, Cyber User Issues, Cyber Crime and Offences.  
**IT Act:** Overview of IT Act, 2000, Amendments and Limitations of IT Act, Electronic Governance, Legal Recognition of Electronic Records.

## UNIT-V

**Hacking:** Introduction of hacking, criminal hacking, ethical hacking, cybersquatting, reverse hijacking, spamming. Ethical Issues in intellectual property right, copy right and related rights, patent and related rights, Trade Marks and rights arising from Trademark registration, software piracy, plagiarism.

### Text Books:

1. Cyber laws and syber security in developing and emerging economies, Zeinab Karake Shalhoub, Luna Al Qasimi
2. Computer Security, Dictergouman, John Wiley & Sons

### Reference Books

1. Computer Security: Art and Science, Mathew Bishop, Addison-Wisley Computer Security, 2nd ed. Author: Dieter Gollmann Publisher: John Wiley & Sons, 2006 ISBN: 0-470-86293-9

# OOP WITH C++ PROGRAMMING

## UNIT-I

**OOPS:** Evolution of programming methodologies, origin of C++, procedural Approach Vs. Object oriented approach, Principles or concepts of OOPs. Merits and demerits of OOPs. Comparison of C and C++, Limitations of C, Introduction to C++, Structure of C++ Program. Added features of C++ over C-Storage classes, reference variables, inline functions, cin, cout. Scope resolution operator.

## UNIT-II

**Objects and Classes:** Defining the class, defining data members and member functions, creating objects, access specifiers- private, public, protected. Nested classes, local classes, empty class. Friend function and friend class, comparison of class with structure. **Memory Management:** new and delete operator, pointer to object, pointer to class members, wild pointers, dangling pointers, smart pointers.

## UNIT-III

**Constructors and Destructors:** Purpose of constructors and destructors, default constructors, constructors with and without parameters, Constructor overloading, copy constructor, deep and shallow copy. **Overloading:** Function Overloading, Unary and binary operator overloading, overloading new and delete operators, overloading special operators.

## UNIT-IV

**Inheritance:** Basic concepts, Reusability and Extensibility, Types of Inheritance, private, public and protected Inheritance. Overriding member functions, **Polymorphism:** Method polymorphism, polymorphism by parameter, parametric polymorphism, early and late binding. **Exceptions:** Inheritance and Exceptions, Exception-Hierarchies, Inside an Exception Handler, defining your own exceptions.

## UNIT-V

**Templates:** Generic functions, Generic classes, Template restrictions. Streams and manipulators. Unformatted I/O functions. **Files:** Opening, reading, writing, appending and closing files.

### Text books:

1. Object Oriented Programming using C++, E. Balagurusamy

### Reference books:

1. Object Oriented Programming in C++, Robert Lafore 2. UML in 21 Days, Tech Media

# MULTIMEDIA TOOLS AND APPLICATIONS

## UNIT-I

**Introduction:** Components, applications, text, font, faces, hypermedia, hypertext, character. images, vector drawing, natural light and colors, color palettes, color models, image file formats, jpeg, bitmap, tiff, dib, eps, cif, pic, tga, aspect ratio, white balance, resolution, raster and vector graphics, hue and saturation.

## UNIT-II

**Sound:** Basic sound concept, types of sound, digitizing sound. Audio formats, MIDI, MP3, 3D sound, digital audio, audio recording, voice recognition, sound forge, creating audio timeline, recording process, animation, animation technique, animation file formats.

## UNIT-III

**Video:** Broadcast video standards- NTSC, PAL, SECAM, ATSC, DTV, HDTV, IPTV, analog and digital video, digital video standards- ATSC, DVB, ISDB, video recording, videos shooting, video editing, video file formats, MPEG, 3GP, AVI, creating video timeline, applying various effects, cut, fade, mix, wipe, getting output.

## UNIT-IV

**Multimedia Authoring Tools:** Introduction, factors for selecting of an authoring tool, Director, Hyper Card, Aimtech, Link way. Stages in designing and producing multimedia products, planning and distribution of multimedia project.

## UNIT-V

**Dynamic Web Designing (Dream-Viewer):** Dream viewer environment, creating a site profile, the importance of site profile, organizing files and folders, folder and file naming rules, creating folder and web page file, implementation/coding process.

### **Text Book**

1. Multimedia tools 2nd edition Pragma Publication.

### **Reference Book:**

1. Encyclopaedia of Multimedia 2nd edition by “BorkoFurht” Springer Publication.

# DATA STRUCTURE USING C

## UNIT-I

**Introduction:** Definition, classification, primitive, non-primitive, operations on data structures, **Stack:** Definition, array representation of stack, operations on stack, infix, prefix and postfix notations, conversion of an arithmetic expression from infix to postfix, applications of stacks. **Queue:** Definition, array representation of queue, simple queue, circular queue, deque, priority queue.

## UNIT-II

**Linked List:** Definition, components, representation of linked list, advantages and disadvantages of linked list, singly linked list, doubly linked list, circular linked list, circular doubly linked list. operations on singly linked list- creation, insertion, deletion, search and display.

## UNIT-III

**Trees:** Basic terminology, binary tree, binary tree representation, complete binary tree, extended binary tree, array and linked list representation of a binary tree, traversing binary trees, insertion and deletion in binary search tree.

## UNIT-IV

**Graphs:** Definition, graph representation, adjacency matrix, adjacency list, DFS, BFS, minimum spanning tree, shortest path algorithm, kruskal and prim's algorithm, hashing.

## UNIT-V

**Sorting:** Types of sorting, bubble sort, selection sort, insertion sort, quick sort, merge sort, heap sort. **Searching:** Sequential Search, Binary Search, comparison between sequential and binary search.

### Text Books:

1. G.S. Baluja, Data structure and algorithm

### Reference book

1. Peter Bras, Advanced Data structure

# WEB TECHNOLOGY

## UNIT-I

**HTML:** Hypertext, text formatting, head and body sections, inserting texts, images, hyperlinks, backgrounds, colour controls, table, fonts, list types, use of frames and forms in web pages.

## UNIT-II

**XML:** Introduction, syntax, accessing data from XML documents. **CSS:** Introduction, level of CSS, inline style sheet, external style sheet, classes, class and ID method, DIV and SPAN tags.

## UNIT-III

**JavaScript:** Introduction, variables, operators, statements, functions, events- click, mouse out, mouse over tc, form validation, J-Query- Introduction, syntax, selectors, events.

## UNIT-IV

**PHP:** Introduction, installation, configuration, data types, syntax, comments, variable, constants, embedding PHP in HTML. Functions- user defined functions, strings concatenation, strings functions. Arrays- creating array and accessing array elements, control statements, loops, form validation.

## UNIT-V

**Database:** Select statements, creating database tables, inserting values, updating and deleting, PHP with MYSQL, creating connections, selecting database, perform database query.

## References

1. Beginning PHP5, Apache, and MYSQL Web Development, Wrox Publication Edition 2005.
2. Beginning HTML, XHTML, CSS, and JavaScript, Jon Duckett Edition 2010.
3. Web Technologies, Black Book, Dream Tech Press Dream Tech Press Edition 2010.

# ACCOUNTING WITH TALLY

## UNIT-I

**Basic-Accounting:** Concepts of accounting, manual vs computerized accounting, golden rule, accounting equation, journal entry, ledger account.

## UNIT-II

**Balance Sheet:** Trial balance and final accounts, ledger-wise trial balance, trading account, profit and loss account, balance sheet, outstanding.

## UNIT-III

**Tally:** Introduction, Gateway of Tally, company creation, company info menu, accountingmaster-features, configuration, setting up of account heads, voucher entries, purchase/sales orderreceipt note, purchase/sales bills, debit/credit note journal, voucher.

## UNIT-IV

**GST:** Creating masters, entering transactions, accounting for return of goods, rate difference in purchase/sale, exempt transactions, sales for registered and composite dealers, vat report.

**CST:** Basics GST, recording interstate transactions, payment of GST, GST reports.

## UNIT-V

**ERP-9:** Tally vault, security control, import-export of data, tally audit, logging and managing control center Online support and help.

**Advanced Topics -** Tally Alternative Tools, Online Tools, Filing Income Tax

### Reference Books:

1. Official Guide to Financial Accounting using Tally.Erp 9 with GST by Tally Education Pvt. Ltd.
2. Tally Essential Level, TALLY EDUCATION PVT LTD
3. Tally ERP 9 Book, Sajee Kurian Learning Tally ERP 9 with GST Best Tally Book in India
4. Tally with GST Advanced Book - Tally with GST (English, Ajay Maheshwari)

# JAVA PROGRAMMING

## UNIT – I

**Evolution:** Creation of Java, Java Byte Code, Java Virtual Machine, difference between Java and C++, Java program structure, Java tokens, data types, variables and constants, primitive and non-primitive data type, operators.

## UNIT – II

**Control Statements:** Selection statements, iteration statements, jump statements. **Class- Method:** Defining a class, adding variables and methods, creating objects, accessing class members, constructors, method overloading, static members, **Inheritance:** extending a class, overriding methods, final variables and methods, final classes, finalize methods.

## UNIT – III

**Arrays:** Arrays, one dimensional array, creating an array, two dimensional arrays, strings, vectors, wrapper classes. **Interfaces:** Introduction, Defining Interfaces, Implementing Interfaces. **Packages:** Java API Packages, Creating and accessing packages, Adding classes to package.

## UNIT – IV

**Multithreading:** Multithreaded programming, life cycle of a thread, creating thread with the thread class and runnable interface. **Exception Handling:** Basic idea of exception handling-the try, catch and throw.

## UNIT – V

**Input/Output:** File input stream, file output stream. **Applets:** Applet security restrictions, the class hierarchy for applets, life cycle of applet. **AWT:** The basic user interface components- Label, Button, Check Box, Radio Button, Choice Menu, Text Area, Frame.

### Text Books:

1. E. Balagurusamy, Fundamental of Java programming

### Reference book:

1. Herbert Schildt, The Complete Reference for Java, TMH publication

# DATA BASE MANAGEMENT SYSTEM

## UNIT-I

**Introduction:** Purpose and advantages of DBMS, view of data, DBMS architecture and data independence, database languages. Classification of DBMS, schema and sub schema. database administrator and users, data dictionary, data modelling using ER model, Entities, attributes and relationships.

## UNIT-II

**Keys:** Domains, relations, kinds of relations, various types of keys, candidate, primary, alternate and foreign keys. Codd's rule Relational algebra- relational algebra with extended operations, tuple relational calculus, domain relational calculus, set operation, aggregate functions, null values, join relations.

## UNIT-III

**Relational Database Design:** pitfalls in relational database design trivial and non trivial dependencies, closure set of dependencies and of attributes. Introduction to normalization, non loss decomposition, FD diagram, 1st, 2nd, 3rd BCNF, 4NF, 5NF

## UNIT-IV

**SQL:** DDL (CREATE, ALTER, DROP), DML (INSERT, UPDATE, DELETE) and DCL (COMMIT, ROLLBACK) commands, specifying constraints in SQL, select statement.

## UNIT-V

Additional features of SQL, PL/SQL (Conditional Statements- IF, NESTED IF, IF-ELSE, SWITCH CASE, Looping Statements- LOOP, WHILE, FOR), cursor, trigger, view

**Case Study:** Oracle, MySQL, MongoDB.

## References:

1. Abraham Silberschatz, Henry Korth, S. Sudarshan, "Database Systems Concepts", 4<sup>th</sup> Edition, McGraw Hill.
2. Jim Melton, Alan Simon, "Understanding the new SQL: A complete Guide", Morgan Kaufmann Publishers.
3. A. K. Majumdar, P. Bhattacharya, "Database Management Systems", TMH.
4. Bipin Desai, "An Introduction to database systems", Galgotia Publications.

# COMPUTER SYSTEM ORGANIZATION

## UNIT-I

**Data Representation:** Number systems, complements, fixed and floating-point representation, character representation, addition, subtraction, magnitude comparison, multiplication and division algorithms for integers

## UNIT-II

**Logic-Circuits:** Logic gates, Boolean algebra, k-map (2,3,4 variable), circuit simplification, sequential circuits, flip-flops and combinational circuits decoders, multiplexers, registers, counters and memory units.

## UNIT-III

**Basic-Design:** Computer registers, bus system, instruction set, timing and control, instruction cycle, memory reference, input-output and interrupt, Interconnection Structures, Bus Interconnection design of basic computer.

## UNIT-IV

**Central Processing Unit:** Register organization, arithmetic and logical micro-operations, stack organization, micro programmed control. Instruction formats, addressing modes, instruction codes, machine language, assembly language, input output programming, RISC, CISC architectures, pipelining and parallel architecture.

## UNIT-V

**Memory Organization:** Memory hierarchy, Cache memory, Associative memory, mapping. Input-Output Organization: Input / Output: External Devices, I/O Modules, Programmed I/O, Interrupt-Driven I/O, Direct Memory Access, I/O Channels.

### Recommended Books:

1. M. Mano, Computer System Architecture, Pearson Education 1992
2. W. Stallings, Computer Organization and Architecture Designing for Performance, 8th Edition 2009, Prentice Hall of India
3. Digital Design, M.M. Mano, Pearson Education Asia

# COMPUTER NETWORK

## UNIT-I

**Introduction:** Definition Internetwork, Intra-network, Extra-network. Network Models- ISO- OSI Reference Model, TCP/IP Protocol Suite. **Physical Layer:** Design Issues, Hub, Repeater, data, signals, bit-rate, baud-rate, bandwidth, Modulation (A2A, A2D, D2A, D2D), Multiplexing, Physical specification, Transmission modes, modes of transfer.

## UNIT-II

**Data Link Layer:** Design issues, Bridge, Switch, LAN Topologies, Error Control, Error detection and correction, Flow Control, Access Control, ARQ, CSMA, CSMA/CD, CSMA/CA, MAC sub-layer, LLC sub-layer, MAC addressing, framing, Ethernet, Bit-oriented Protocol, Character-oriented Protocol, SDLC, HDLC, polling and selecting.

## UNIT-III

**Network Layer:** Design Issues, Router, Routing, Types of Routing, Static and Dynamic Routing, Packets, IP packet, logical addressing, IPV4 vs. IPV6, IP addressing, CIDR, sub-netting.

## UNIT-IV

**Transport Layer:** Design Issues, end-to-end delivery, Error control, flow control, TCP protocol, UDP protocol, TCP packet, UDP datagram, Congestion control, Quality of service, Port Addressing, Segments & reassembly, Gateway, Protocol Converter.

## UNIT-V

**Application Layer:** Data Compression Process, Hyper Text Transfer Protocol (HTTP), File Transfer Protocol (FTP), Simple Message Transfer Protocol (SMTP), Telnet, Simple Network Management Protocol (SNMP), Trivial File Transfer Protocol TFTP, Post Office Protocol (POP3), (Network File System) NFS.

### Text Books:

1. Data Communications and Networking, Behrouz A. Forouzan, 3rd Edition, Tata Mc Graw- Hill

### Reference Book:

1. Understanding Data Communications and Networks, William A. Shay, 2<sup>nd</sup> Edition, Vikas Publications

# ENTREPRENEURSHIP DEVELOPMENT

## UNIT-I

**Entrepreneurial-Management:** Evolution of entrepreneurship, John Kao's Model on Entrepreneurship, Identifying opportunities and Evaluation; Building the Team /Leadership; Strategic planning for business; Steps in strategic planning, **Ownership:** Sole proprietorship; partnership; limited liability partnership and corporation form of ownership; advantages/disadvantages, **Franchising:** Advantages/Disadvantages of franchising; types of franchise arrangements; franchise contracts; franchise evaluation checklist, Financing entrepreneurial ventures.

## UNIT-II

**Creativity-Innovation:** Stimulating Creativity; Organisational actions that enhance/hinder creativity, Managerial responsibilities, Creative Teams; Sources of Innovation in Business; Managing Organizations for Innovation and Positive Creativity.

## UNIT-III

**Social-Entrepreneurship** Introduction to Social Entrepreneurship; Characteristics and Role of Social Entrepreneurs; Innovation and Entrepreneurship in a Social Context; Start-Up and Early-Stage Venture Issues in creating and Sustaining a Non-profits Organization; Financing and Risks; Business Strategies and Scaling up.

## UNIT-IV

**Family Business:** Concept, structure and kinds of family firms, Culture and evolution of family firm, Managing Business, family and shareholder relationships, conflict resolution in family firms, Managing Leadership, succession and continuity, women's issues in the family business, Encouraging change in the family business system.

## UNIT-V

**Financing-Business:** Arrangement of funds; Traditional sources of financing, Loan syndication, Consortium finance, role played by commercial banks, appraisal of loan applications by financial institutions, Venture capital.

### Readings

1. Burns, P. (2001). Entrepreneurship and small business. New Jersey:Palgrave.
2. Drucker, P. F. (2006). Innovation and entrepreneurship: Practice and principles. USA: Elsevier.
3. Gersick, K. E., Davis, J. A., Hampton, M. M., &Lansberg, I. (1997). Generation to generation: Life cycles of the family business. Boston: Harvard Business School Press.
4. Hisrich, R., & Peters, M. (2002). Entrepreneurship. New Delhi: Tata McGraw Hill.
5. Holt, D. H. (2004). Entrepreneurship new venture creation. New Delhi: Prentice Hall of India.
6. Kaplan, J. (2004). Patterns of entrepreneurship. Wiley.
7. Khandwalla, P. (2003). Corporate creativity. New Delhi: Tata Mc.Graw Hill.

# CURRENT TRENDS AND TECHNOLOGIES

## UNIT-I

**Python:** Introduction, Data types and Operators, Python Statements and Conditionals, Functions. Strings, Object oriented programming with Python, Errors and Exception Handling, File handling, Regular expression, Modules and Package.

## UNIT-II

**Android:** Introduction to Android. Smartphone features, Installing the SDK., Creating Android Emulator, Installing Eclipse. Installing Android development tools. Android Life cycle. Android applications structure, Android controls, Option Menu. Database (SQLite database). Creation of .apk file.

## UNIT-III

**AngularJS:** Introduction, History, Expressions, Modules, Directives, Data Binding Controllers, Scope, Filters, Services, Global API, forms and events, Form Validation applications, Introduction to NodeJS

## UNIT-IV

**IOT:** Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models & APIs. Challenges in IoT, Domain specific applications of IoT, Overview of Arduino platform, Raspberry Pi (RPi)

## UNIT-V

**Web Technologies:** Web languages, Web Hosting, Domain Name Server (DNS), Types of Web Hosting Services, Features of a Hosting Plan, Web Server - Linux or Windows. Overview of Internet Security, Firewalls, Internet Security Privacy and Copyright Issues, Basics of Asymmetric Cryptosystems, AWS.

### Reference books

1. Pro AngularJS -By Adam Freeman
2. AngularJS Web Application Development Cookbook - By Matt Frisbie
3. AngularJS Programming by Example - By Agus Kurniawan
4. Angular JS: Up and Running - O'Riley Med

# **E- COMMERCE & GOVERNANCE**

## **UNIT-I**

**Introduction:** History of e-commerce, e-business models B2B, B2C, C2C, C2B, legal environment of e-commerce, ethical issues, electronic data interchange, value chain and supply chain, advantages and disadvantages of e-commerce.

## **UNIT-II**

**Electronic Payment Systems:** Credit cards, debit cards, smart cards, e-credit accounts, e-money, Marketing on the web, marketing strategies, advertising on the web, customer service and support, introduction to m-commerce,

**Case Study:** e-commerce in passenger air transport, Outline Payment System Gateway.

## **UNIT-III**

**E-Government:** Theoretical background of e-governance, issues in e-governance applications, evolution of e-governance, its scope and content, benefits and reasons for the introduction of e-governance, e-governance models- broadcasting, critical flow, comparative analysis, mobilization and lobbying, interactive services / G2C2G.

## **UNIT-IV**

**E-Readiness,** e-government readiness, E- Framework, step & issues, application of data warehousing and data mining in e-government,

**Case Studies:** NICNET-role of nationwide networking in e-governance, e-seva.

## **UNIT-V**

**Systems Security:** Challenges and approach to e-government security, security concern in e-commerce, security for server computers, communication channel security, security for client computers.

### **References:**

1. Gary P. Schneider, "E-commerce", Cengage Learning India.
2. C.S.R. Prabhu, "E-governance: concept and case study", PHI Learning Private Limited.
3. V. Rajaraman, "Essentials of E-Commerce Technology", PHI Learning Private Limited.
4. David Whiteley, "E-commerce study, technology and applications", TMH.
5. J. Satyanarayan, "E-government: The science of the possible", PHI Learning Private Limited.
6. P.T. Joseph, "E-Commerce: An Indian Perspective", PHI Learning Private Limited.
7. Hanson and Kalyanam, "E-Commerce and Web Marketing", Cengage Learning India.

# **.NET TECHNOLOGIES**

## **UNIT-I**

**Introduction:** .Net framework features & architecture, CLR, Common Type System, MSIL, Assemblies and Class Libraries, .NET languages and benefits of .NET application C# and ASP.NET, difference between PHP and ASP.NET.

## **UNIT-II**

**C-Sharp Language (C#):** Introduction, Data Types, Identifiers, Variables, Constants, Literals, Array and Strings, Object and Classes, Inheritance and Polymorphism, Operator Overloading, Interfaces, Delegates and Events. Type conversion.

## **UNIT-III**

**Visual C#.NET:** Overview of C#, Visual C#.NET Development Environment, **.NET Controls:** working with .Net Controls. Windows based software development, introduction to MDI Parent Form.

## **UNIT-IV**

**Web Application Development:** Web servers, IIS configuration, ASP.NET Controls, ASP.NET web form controls, accessing controls buttons, Text Box, Labels, Checkbox, Radio Buttons, List Box, calendar etc. **Validation Controls:** Required Field Validator, Range Validator, Regular Expression Validator, Compare Validator etc., creating and using web services.

## **UNIT-V**

**ADO.Net (Using C#.NET):** Architecture of ADO.Net, .Net data provider, accessing data using command and data adapter, data set, data reader, binding data in data grid view. **XML:** accessing data from XML document. Creating web page using AJAX and JQuery, introduction to MVC application.

### **Reference Book:**

1. Kothari Nikhil and Datye Vandana, Developing ASP .NET Server Controls and Components, Tata McGraw Hill, 2003.
2. Esposito Dino, Applied XML Programming for Microsoft .NET, Tata McGraw Hill, 2003.

### **Text Book:**

1. Asp.net 3.5 black book (covers c# and vb 2008 codes) - dreamtech publication
2. The complete reference asp.net by mathewmacdonald - tmh
3. Professional asp.net- wrox publication

# LINUX AND SHELL PROGRAMMING

## UNIT-I

**Introduction:** Basic architecture of UNIX, different flavour, CUI and GUI, LINUX vs windows file system, boot block, data block, super block, I-node block & I-node table, Linux file access. basic utilities.

## UNIT-II

**Basic-Commands:** cat, cp, wc, ls, rm, mv, etc. **Directory Related Command:** pwd, cd, mkdir, rmdir, etc, **File Permission:** Security levels, Users, group and ownership of files, chmod command, editing with vi, back ground jobs, mounting and un mounting, link and unlink, **Mathematical Commands:** bc, expr.

## UNIT-III

**Text Manipulation:** grep, egrep, sed, cut, paste, sort, split, tr, cmp, comm, diff, head, tail, **User to User Communication:** write, mail, mesg, wall, printing file with lp and pr

## UNIT-IV

**Process:** structure of process and process control, process states and transition, process context  
Process command: ps, kill, nice etc, **Scheduling Commands:** at and crontab, sleep, wait

## UNIT-V

**Shell Programming:** shell, different types of shell, default assigned shell. Shell variable, key words, environment variable, shell script, parameter passing, for loop, while loop, until loop, if statement, case statement.

## Reference Books

1. MJ Bach "Design of Unix OS"
2. Meeta Gandhi, Tilak Shetty and Rajiv Shah – The 'C' Odyssey Unix –The open Boundless C, 1st Edition, BPB Publications 1992.
3. Y Kanetkar "Unix shell programming" BPB Pub
4. Rachel Morgan. HenryMcGilton "Introducing UNIX System V"

## Elective

# PYTHON PROGRAMMING

## UNIT-I

**Introduction:** History, Features, Setting up path, Working with Python, Basic syntax, Variable and Data Types, Operator. Conditional Statements, Looping, Control Statements, String Manipulation

## UNIT-II

**Lists:** Introduction, Accessing list, Operations, Working with lists, Function and Methods  
**Tuple:** Introduction, Accessing tuples, Operations, Working, Functions and Methods.  
**Dictionaries:** Introduction, Accessing values in dictionaries, working with dictionaries, Properties, Functions. **Modules:** Importing module, Math module, Random module, Packages, Composition.

## UNIT-III

**Input-Output:** Printing on screen, reading data from keyboard, Opening and closing file, Reading and writing files, **Exception Handling:** Exception, Exception Handling, Except clause, Try ??? finally clause, User Defined Exceptions.

## UNIT-IV

**OOPs Concept:** Class and object, Attributes, Inheritance, Overloading, Overriding, Data hiding. **Regular expressions:** Match function, Search function, Matching VS Searching, Modifiers, **CGI:** Introduction, Architecture, CGI environment variable, GET and POST methods, Cookies, File upload. **Database:** Introduction, Connections, Executing queries, Transactions, Handling error.

## UNIT-V

**Networking:** Socket, Socket Module, Methods, Client and server, Internet modules.  
**Multithreading:** Thread, Starting a thread, threading module, Synchronizing threads, Multithreaded Priority Queue. GUI Programming: Introduction, Tkinter programming, Tkinter widgets, Sending email

### Text Book:

1. Programming in python, Mark Summerfield, 2nd edition, Addison – Wesley publication

### Reference Books:

1. Programming Python, 4th Edition - O'Reilly Media

# CLOUD COMPUTING

## UNIT-I

**Cloud Computing:** Introduction, components, cloud providers, SAAS, PAAS, IAAS, organizational scenarios of clouds, benefits and limitations. **Cloud Computing Platforms:** Infrastructure as service, Amazon EC2, Google App Engine, Microsoft Azure.

## UNIT-II

**Cloud Technologies:** Study of Hypervisors, AJAX, Web Services: SOAP and REST, SOAP versus REST, **Virtualization Technology:** Virtual machine technology, virtualization applications in enterprises, pitfalls of virtualization.

## UNIT-III

**Data in the Cloud:** Relational databases, cloud file systems: GFS and HDFS, Big-Table, HBase and Dynamo. Map-Reduce and Extensions: parallel computing, The Map-Reduce model, Enterprise batch processing using Map-Reduce, Example/Application of Map-reduce, Features and comparisons among GFS, HDFS.

## UNIT-IV

**Cloud Administration:** Cloud Management Products, Emerging Cloud Management Standards, Securing the Cloud, Securing Data, Establishing Identity and Presence.

**Case Study:** Google Cloud, Azure, AWS

## UNIT-V

**Cloud Quality of Service:** Implementing real time application over cloud platform, Issues in Inter-cloud environments, data migration, Mobile Cloud Computing. A grid of clouds, Sky computing, load balancing, resource optimization, Monitoring in Cloud.

### Text Books:

1. Rajkumar Buyya, Christian Vecchiola, and S. ThamaraiSelvi, "Mastering Cloud Computing", McGraw Hill Education Pvt. Ltd.

### Reference Books:

1. GautamShroff, "Enterprise Cloud Computing", Cambridge University Press.

## **Semester 3**

### **PROGRAMMING IN C – LAB**

1. Write a program to print the number 100 to 1.
2. Write a program to check whether the number is even or odd.
3. Write a program to print the table of 1 to 10.
4. Write a program to print the sum and product of a digit of an integer.
5. Write a program to find the greatest number among the three.
6. Write a program to check whether the given number is a prime number.
7. Write a program to calculate the factorial of a given number.
8. Write a macro that swaps two numbers.
9. Write a program to print a square of stars.
10. Write a program that swaps two numbers using the call by value method.
11. Write a program that swaps two numbers using a pointer.
12. Write a program to perform read and write operations on a file.

### **HARDWARE INSTALLATION & MAINTENANCE LAB**

1. Find out the storage capacity and manufacturer of the hard disk.
2. Find out the storage capacity and manufacturer of the ROM.
3. Find out the total storage capacity of RAM and the capacity of individual RAM circuits.
4. Find the manufacturer and the operating speed of the CPU.
5. List out various types of Buses inside the computer system.
6. Find out the power supply and number of voltages are supplied by it.
7. Locate the Hard Disk, SMPS, RAM, BIOS, ROM, PCI socket, on the motherboard.
8. Find out the functions of ISA and PCI sockets in the motherboard.
9. Find out the functions of input/output cards attached to the motherboard.
10. Write down the total number of ports and their pins in each port.
11. Write down various components of the motherboard and form factors.
12. Write down various components and functions of the BIOS chip.

## **Semester 4**

### **OOP WITH C++ PROGRAMMING-LAB**

1. Write a program in C++ to show the implementation of an abstract class.
2. Write a program in C++ to demonstrate the constructor overloading.
3. Write a program in C++ to demonstrate the friend function.
4. Write a program in C++ to demonstrate the diamond problem.
5. Write a program in C++ to demonstrate the parameterized constructor.
6. Write a program in C++ to demonstrate multilevel inheritances.
7. Write a program in C++ to copy the content of a file into another file.
8. Write a program in C++ to append the content of a file into another file.
9. Write a C++ program to demonstrate operator overloading.
10. Write a program in C++ to demonstrate static members.
11. Write a program in C++ to demonstrate virtual function.
12. Write a program in C++ to make a calculator using the Class template.

### **DATA STRUCTURE AND MULTIMEDIA – LAB**

1. Write a C-Program to implement a queue.
2. Write a C-Program to implement a dequeue.
3. Write a C-Program to implement a graph.
4. Write a C-Program to implement stack.
5. Write a C-Program to implement a link list.
6. Write a C-Program to perform a linear search.
7. Write a C-Program to perform a binary search.
8. Write a C-Program to perform selection sort.
9. Write a C-Program to perform bubble sort.
10. Write a C-Program to perform insertion sort.
11. Write a C-Program to evaluate postfix expression.
12. Write a C-Program to implement hashing.

## **Semester 5**

### **JAVA PROGRAMMING – LAB**

1. Write a Java program to sort an array in ascending/descending order.
2. Write a program to illustrate exception handling.
3. Write a Java program to implement the inheritance.
4. Write a java program to implement method overriding.
5. Write a Java program to make a simple calculator using switch...case.
6. Write a Java program to find the occurrence of a character in a string.
7. Write a java program thread creation by implementing a runnable interface.
8. Write a java program for displaying an image in an applet.
9. Write a java program for an applet skeleton.
10. Write a Java program to design a login window.
11. Write a program for database connectivity.
12. Write a program to demonstrate typecasting.

### **DBMS – LAB**

1. Use of data definition language commands.
2. Use of data manipulation language commands.
3. Use of data control language commands.
4. Creation of procedure and function.
5. Program to perform all arithmetic operations.
6. Program to find simple interest.
7. Program to print your name n times.
8. Program to check whether a given number is even or odd.
9. Program to print table of the given number.
10. Program to print factorial of the given number.
11. Program to print factorial of the given number.
12. Program to find the greatest of three numbers.

# **Semester 6**

## **NET – LAB**

1. Write code to implement combo box control.
2. Write a program to display the following feedback form.
3. Write a program that displays a button in green colour and it should change into yellow when the mouse moves over it.
4. Write a program to get a user input such as the boiling point of water and test it to the appropriate value using Compare Validator.
5. Create a user control that displays the current date and time. Include it in a Web Form and refresh it each time a button is clicked.
6. Write code to implement calendar control.
7. Write a program to implement multiple document interface.
8. Write C# code to implement inheritance.
9. Write C# program to implement operator overloading.
10. Write code to implement session state.
11. Write code for database connectivity modal implementation.
12. Write a program to access data from an XML file.

## **CURRENT TRENDS AND TECHNOLOGIES (LAB)**

1. Turn on the LED by using the ESP8266 module.
2. IoT smart home automation using Node MCU.
3. IoT Based Humidity and Temperature Monito using Arduino Uno.
4. Create-Hello World application. That will display -Hello World.
5. Also, display Hello World in the middle of the screen in the Android.
6. Write an AngularJS/JavaScript program for define the controller.
7. Write an AngularJS/JavaScript program for applying form validator.
8. Write a NodeJS/JavaScript program for defying events.
9. Write a Python program to retrieve a string in reverse order.
10. Write a Python program to check whether a number is Prime or not.
11. Write a Python program to find the largest element in an array.
12. Write a Python program to interchange the first and last elements in a list.