



**DR. A P J ABDUL KALAM UNIVERSITY,  
INDORE**

## **SYLLABUS**

*Of*

**BACHELOR OF ENGINEERING  
Information Technology & Engineering  
(Third Year, Grading System)**

**(Session July- December 2017)**

**College of Engineering**

**Dr. A P J Abdul Kalam University, Indore**

# **DR. A P J ABDUL KALAM UNIVERSITY, INDORE**

## **Syllabus for Bachelor of Engineering**

### **Information Technology & Engineering**

#### **List of Subject (Third Year, Grading System)**

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Unit I Data and signal-Analog and digital signals, Time and frequency domain, Composite signals, - Bandwidth, bit rate, bit length, Baseband and broadband transmission, Attenuation, distortion, noise, Nyquist bit rate ,Shannon capacity ,Throughout, delay ,Jitter, Bandwidth delay product.

Unit II Data communication concepts – Data transmission – Parallel and serial transmission, synchronous, and Asynchronous transmission, Simplex, half duplex and full duplex , unipolar and polar line codes, Non return to zero codes, return to zero codes, bipolar line codes, bauds , modem, Line configurations-Point to point and point to multipoint configuration.

Unit III Telephone Network-Network topology, signaling- SS7,dial-up modems, modem standard, digital subscriber line – ADSL,SDSL,VDSL .Multiplexing, Frequency division multiplexing, time division multiplexing and wavelength division multiplexing, pulse code modulation, pleisochronous digital hierarchy( PDH), synchronous digital hierarchy ( SDH) ,STM -1 frame, virtual container, mapping of data signals on STM- 1.

Unit IV Switching techniques- Circuit , packet and hybrid switching, Types of error, single bit error, burst error, Error detection , Vertical redundancy check, Longitudinal redundancy check, cyclic redundancy check, error correction, Integrated services digital network, ISDN interface, ISDN devices, reference points ,ISDN services, ISDN Protocols

Unit V Transmission media-Guided and unguided media, twisted pair ,Unshielded twisted pair and Shielded twisted pair, coaxial cable and fiber optic cable, radio waves, microwaves and infrared transmission RJ- 45,Network interface card, rack, cable standard-Category 5,6,and 7,cross connection, straight connection cable coding standards.

References:-

1. “Data communication and networking”, Forouzan, TMH 4 th edition
2. Data communication and Computer Networks, Prakash C Gupta ,PHI Learning
3. “Computer Networks” - Tanenbaum ,PHI Learning.
4. “Communication Networks-Fundamental concepts and key Architectures”, Leon-Garcia, Widjaja, TMH 5. “Computer Communications & Networking Technologies”-Michael A. Gallo & William M. Hancock -Cengage pearson publications
6. “Network for computer scientists & engineers” –Youlu zheng & shakil akhtar , Oxford pub.

### **List of Experiment**

1. Case Study of digital interface RS-232
2. Case Study of Synchronous and asynchronous transmission
3. Case Study of various multiplexing techniques
4. Case Study of Parallel and serial transmission
5. ISDN implementation for internet
6. ISDN Devices
7. Study of SDH
8. Study of Network Interface Card
9. Study of twisted pair,coaxial cable and Fiber optic cable
10. Study of cross cable connection and straight cable connection
11. Study of digital subscriber line-ADSL for broadband connection
12. Study of NRZ and RZ Codes

**Unit-I** Introduction to Storage Technology: Data proliferation, evolution of various storage technologies, Overview of storage infrastructure components, Information Lifecycle Management, Data categorization.

**Unit-II** Storage Systems Architecture: Intelligent disk subsystems overview, Contrast of integrated vs. modular arrays, Component architecture of intelligent disk subsystems, Disk physical structure components, properties, performance, and specifications, RAID levels & parity algorithms, hot sparing, Front end to host storage provisioning, mapping and operation.

**Unit-III** Introduction to Networked Storage: JBOD, DAS, NAS, SAN & CAS evolution and comparison. Applications, Elements, connectivity, standards, management, security and limitations of DAS, NAS, CAS & SAN.

**Unit -IV** Hybrid Storage solutions; Virtualization: Memory, network, server, storage & appliances. Data center concepts & requirements, Backup & Disaster Recovery: Principles Managing & Monitoring: Industry management standards (SNMP, SMI-S, CIM), standard framework applications, Key management metrics (Thresholds, availability, capacity, security, performance).

**Unit-V** Information storage on cloud :Concept of Cloud, Cloud Computing, storage on Cloud, Cloud Vocabulary, Architectural Framework, Cloud benefits, Cloud computing Evolution, Applications & services on cloud, Cloud service providers and Models, Essential characteristics of cloud computing, Cloud Security and integration.

**References:**

1. G. Somasundaram & Alok Shrivastava (EMC Education Services) editors; Information Storage and Management: Storing, Managing, and Protecting Digital Information; Wiley India.
2. Ulf Troppens, Wolfgang Mueller-Friedt, Rainer Erkens, Rainer Wolafka, Nils Haustein; Storage Network explained : Basic and application of fiber channels, SAN, NAS, iSESI, INFINIBAND and FCOE, Wiley India.
3. John W. Rittinghouse and James F. Ransome; Cloud Computing : Implementation , Management and Security, CRC Press, Taylor Frances Pub.
4. Nick Antonopoulos, Lee Gillam; Cloud Computing : Principles, System & Application, Springer.
5. Anthony T. Velete, Toby J.Velk, and Robert Eltenpeter, Cloud Computing : A practical Approach, TMH Pub.

6. Saurabh , Cloud Computing : Insight into New Era Infrastructure, Wiley India.
7. Sosinsky, Cloud Computing Bible, Wiley India.
8. Rich Schiesser, IT Systems Management :Designing, Implementing and Managing Worldclass Infrastructures, PHI Learning

Unit I Importance of computer networks, broadcast and point to point networks, Local area networks and Wide area networks , Introduction to ISO-OSI reference model, TCP/IP reference model , function of each layer, interfaces and services, Protocol data unit, connection oriented and connectionless services, service primitives, comparison of TCP/IP and ISO-OSI reference model, Novel Netware, Arpanet , X.25

Unit II Data-Link layer: - Data link layer design issues, framing , flow & error control , physical addressing, Stop & Wait protocol , Go back N ARQ , selective repeat ARQ , piggybacking and pipelining , HDLC LAN Protocol stack-Logical link control and Media Access Control sublayer, IEEE 802.2 LLC Frame format Data link layer in the internet, Serial line IP and Point to point protocol

Unit III MAC layer Protocols- , static and dynamic allocation , Pure and slotted ALOHA protocols, Carrier sense multiple access, Persistent and non persistent CSMA, IEEE standard 802.3 and Ethernet, 802.3 cabling, IEEE 802.4, IEEE 802.5, FDDI Wireless LAN , Comparison of wired and wireless LAN, WIMAX

Unit IV The Network layer- logical addressing, classful & classless addressing , address mapping , packet delivery & forwarding. unicast routing protocols , multicast routing protocols, Routing algorithm- Least Cost, Dijkstra's, Bellman-ford, congestion control algorithms, Internetworking devices, Introduction to Internet protocol IPv4

Unit V Transport layer-Transport services , Process to process delivery, UDP , TCP , congestion control , quality of service , Integrated services, Differentiated services LAN-WAN Design and implementation-Configuring TCP/IP, using Ipconfig, ping command , study of structured LAN , study of internetworking devices and their configuration—switches, hubs, Bridges, routers and Gateways

**References:-**

1. “Local area networks”, Forouzan, TMH, 1st edition
2. “Computer Networks” - Tanenbaum , PHI Learning.
3. Computer Networks: Protocols, Standards and Interfaces By Black, PHI learning
4. “Computer Communications & Networking Technologies”-Michael A. Gallo & William M. Hancock -Cengage pearson publications

### **List of Experiment**

1. Establishment and configuration of LAN
2. Colour coding standard of CAT 5,6,7 and crimping of cable in RJ-45
3. Study of WAN
4. Case study of STOP AND WAIT Protocols
5. Study of sliding window protocol
6. Study of IEEE 802.3 , 802.4 ,802.5
7. Study of FDDI
8. Study of basic networking commands like ping, ipconfig, etc



Unit I Introduction Language Processors, Language Processing Activities and Language Processors Development Tools, Assemblers, Compiler, Macros and Macro Processors, Linkers, Software Tools . Introduction to Operating Systems, Types of operating Systems, system protection, Operating system services.

Unit II Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling. Process concept, operations on processes, threads, interprocess communication, precedence graphs, critical section problem, semaphores, classical problems of synchronization,

Unit III Deadlock problem, deadlock characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Methods for deadlock handling. Concepts of memory management, logical and physical address space, swapping, Fixed and Dynamic Partitions, Best-Fit, First-Fit and Worst Fit Allocation, paging, segmentation, and paging combined with segmentation.

Unit IV Concepts of virtual memory, Cache Memory Organization, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation, Role of Operating System in Security, Security Breaches, System Protection, and Password Management.

Unit V Disk scheduling, file concepts, File manager, File organization, access methods, allocation methods, free space managements, directory systems, file protection, file organization & access mechanism, file sharing implement issue, File Management in Linux, introduction to distributed systems.

**References:**

1. M. Flynn “ Operating Systems”. Cengage Learning.
2. Silberschatz ,”Operating system”, Willey Pub
3. Tanenbaum “ Modern Operating System” PHI Learning.
4. Dhamdhere, ”System Programming and Operating System”,TMH.
5. Stuart,”Operating System Principles, Design & Applications”,Cengage Learning
6. Operating System : Principle and Design by Pabitra Pal Choudhury, PHI Learning

### **List of Experiment**

1. Program to implement FCFS CPU scheduling algorithm.
2. Program to implement SJF CPU scheduling algorithm.
3. Program to implement Priority CPU Scheduling algorithm.
4. Program to implement Round Robin CPU scheduling algorithm.
5. Program to implement classical inter process communication problem(producer consumer).
6. Program to implement classical inter process communication problem(Reader Writers).
7. Program to implement classical inter process communication problem(Dining Philosophers).
8. Program to implement FIFO page replacement algorithm.
9. Program to implement LRU page replacement algorithm

UNIT-I The Java Environment: Java Development Kit (JDK) ,Java virtual machine , Java programming environment (compiler, interpreter, appletviewer, debugger), , Java Applications Programming Interface (API), Basic idea of application and applet. Java as an object oriented language:objects, classes, encapsulation, inheritance,and software reuse, polymorphism, abstract classes and abstract methods, : defining an interface, implementing & applying interfaces, variables in interfaces, extending interfaces, Packages,scope and lifetime; Access specifies; Constructors; Copy constructor; this pointer; finalize () method; arrays; Memory allocation and garbage collection

UNIT-II AWT:Containers and components,AWT classes, window fundamentals: Component,Container,Panel,Window,Frame,Canvas, AWT Controls,Layout Managers and Menus:adding and removing control,Labels, Button, Check Box, Radio Button, Choice ,menu, Text area, Scroll list, Scroll bar; Frame; Layout managers- flow layout, Grid layout, Border layout, Card layout. Java Event Handling Model: Java's event delegation model – Ignoring the event, Self contained events, Delegating events; The event class hierarchy; The relationship between interface, methods called, parameters and event source; Adapter classes; Event classes action Event, Adjustment Event, Container Event, Focus Event, Item Event, Key Event, Mouse Event, Text Event, Window Event. Applets: Applet security restrictions; the class hierarchy for applets; Life cycle of applet; HTML Tags for applet Introduction to Swing: swing library, Building applications using Swings

UNIT-III Multithreading and Exception Handling: Overview of simple threads, Basic idea of multithreaded programming, Thread synchronization:Locks, synchronized methods, synchronized block, Thread scheduling, Producer-consumer relationship, Daemon thread, Basic idea of exception handling,stack based execution and exception propagation,Exception types;, Exception Handling:Try,Catch,Finally,Throw statement,Assertions

UNIT-IV Input/Output : Exploring Java I/O., Directories, stream classes The Byte stream : Input stream, output stream, file input stream, file output stream, print stream, Random access file, the character streams, Buffered reader, buffered writer, print writer, serialization. JDBC: JDBC-ODBC bridge; The connectivity model; The driver manager; Navigating the result set object contents; java.sql Package; The JDBC exception classes; Connecting to Remote database.

UNIT-V Java Networking : exploring java.net packageNetworking Basics : Socket, Client server, reserved sockets, proxy servers, Internet addressing, TCP sockets, UDP sockets. RMI:Client/Server architecture, RMI registry services; Steps of creating RMI Application and an example.

**REFERENCES:-**

1. Naughton & Schildt "The Complete Reference Java 2", Tata McGraw Hill
2. Deitel "Java- How to Program:" Pearson Education, Asia
3. Horstmann & Cornell "Core Java 2" (Vol I & II) , Sun Microsystems
4. Ivan Bayross "Java 2.0" : BPB publications
5. Ivor Horton's "Beginning Java 2, JDK 5 Ed., Wiley India. 6. Java Programming for the absolute beginners By Russell, PHI Learning

Unit I JDK Installation and setting the path, JDK Tool(Java Compiler, Java Virtual Machine, Debugger, Appletviewer, Javadoc, Jar), Compile and run java program, Compiler options and JVM options, Data type, Operators , Control Statement (if, if...else, switch ...case, while, for, do...while, break, continue, labeled break, labeled continue) , Arrays ,Memory allocation and garbage collection,Classes and object scope and life time ,Access specifies, Constructor and finalize method , this keyword, instance block, static block, static data member, static method, Inheritance, method overriding, dynamic method dispatch, constructors in Inheritance ,super keyword, abstract method and abstract class, final method ,final data member, final class, defining an Interface, Implementing and applying interface, extending Interface.

Unit-II creating package , using package. Try, catch, throw, throws, finally, Object Class,String Class, String Buffer class, Math Class, Wrapper Classes, StringTokenizer Class, Collection, Set, List Map, ArrayList, SortedSet, Iterator, File Class, Thread class and its method, Creating Thread ,lifecycle of a thread, Runnable Interface, thread synchronization, wait, notify, ThreadGroup class.

Unit -III Command Line Arguments, InputStream , OutputStream,Reader,Writer, ,FileInputStream, FileOutputStream, DataOutputStream, DataInputStream, FileReader, FileWriter, InputStreamReader, BufferedReader ,ObjectOutputStream, ObjectInputStream, Object Serialization.,Scanner , RandomAccessFile.

Unit -IV Abstract Window toolkit, awt package, Applet, Lifecycle of an Applet, GUI Component (Button, Label, TextField, TextArea, List, Choice, CheckBox ), Panel, Event Source, Event handlers, Event classes, Containers, Frame class, Panel ,Dialog , Layout Manager,Swing, swing components, JFrame, JApplet, JPanel, JButton, JLabel, JTable, JTextField,JTextArea,JRadioButton,JCheckBox,JList JTree, Icon,LookAndFeel.,Graphics2D and drawing Image.

Unit-V Networking basics, Socket, port, Proxy servers, Internet addressing and URL, java.net – networking classes and interfaces, Implementing TCP/IP based Server and Client. Classes to be covered Socket, ServerSocket, IPAddress, URL connections; Programs on chatting 1-1 & 1-M (Threading),Implementing UDP based Server and Client DatagramPacket and DatagramSocket. Introduction of RMI & Architecture ,Implementing RMI ,Writing RMI Server, Designing Remote Interface, Implementing Remote Interface, Passing Object in RMI, Creatting RMI Client. Types of JDBC Drivers, Writing JDBC applications using select, insert, delete, update; Types of Statement objects (Statement, PreparedStatement and CallableStatement); ResultSet, ResultsetMetaData; Inserting and updating records, Connection Pooling.

**Reference Books:-**

1. Java 2 Complete Reference (5th Ed ), Herbert Schildt, TMH
2. Core Java Volume-I, Horstman and Cornell, Pearson Education
3. Core Java Volume-II, Horstman and Cornell, Pearson Education

**Unit 1: Development of Proficiency in English :** Practice on Oral and spoken communication skill & testing – ,voice & accent, voice clarity, voice modulation & intonation,word stress etc. Feedback and questioning Technique ,Objectiveness in Argument,Development etiquettes and manners ,Study of different pictorial expression of non-verbal communication and its analysis

**Unit 2: Microsoft office:**Microsoft word, Microsoft power point, Microsoft Excel, use of skype, use of internet.

**Unit 3: Communication skills:** Visual, nonverbal and aural communication, Understanding the communicative environment, Understanding the communicative environment, What to listen for and why, When to speak and how, Starting and sustaining a conversation

**Unit 4: Communication skills Visual,** nonverbal and aural communication, The world of visual culture, Visual perception, The aural: Its relevance and impact, The body and the way it communicates, The face, its expressions and what it says.

**Unit 5: Concept of 4 method for presentation,**Preparation & introduction ,Presentation ,Evaluation / feedback Summarization / Conclusion,Presentation Skill practice ,Preparing in presentation ,Delivery of presentation.

**References:**

1. E.H. Mc Grath: S.J.:Basic Managerial Skills for All (Published by Phi)
2. Allen Pease:Body Language(published by agreement and Pease international)
3. Joan Lambert: Microsoft Office 2016 Step by Step (Step By Step (Microsoft)

**Objective of GD and seminar:**

Objective of GD and seminar is to improve the MASS COMMUNICATION and CONVINCING/ Understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves.

**Evaluation** will be done by assigned faculty based on group discussion and power point Presentation.



**Objective of NSS/NCC:**

Objective of NSS/NCC is to improve the Helping Nature in Social/ Develop Skills, Respect to each other, Communication and Convincing/ Understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves.

**Evaluation** will be done by assigned faculty based on Qualifier

Unit I: Characterization of Distributed Systems: Introduction, Examples of distributed Systems, Resource sharing and the Web Challenges. System Models: Architectural models, Fundamental Models Theoretical Foundation for Distributed System : Limitation of Distributed system, absence of global clock, shared memory, Logical clocks, Lamport's & vectors logical clocks. Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and non token based algorithms.

Unit II: Distributed Deadlock Detection: system model, resource Vs communication deadlocks, deadlock prevention, avoidance, detection & resolution, centralized dead lock detection, distributed dead lock detection, path pushing algorithms, edge chasing algorithms. Agreement Protocols: Introduction, System models, classification of Agreement Problem, Byzantine agreement problem, Consensus problem.

Unit III: Distributed Objects and Remote Invocation: Communication between distributed objects, Remote procedure call, Events and notifications, Java RMI case study. Security: Overview of security techniques, Distributed File Systems: File service architecture, Sun Network File System, The Andrew File System.

Unit IV: Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery. Replication: System model and group communication, Fault-tolerant services, Transactions with replicated data.

Unit V: Distributed Algorithms: Destination based routing, APP (assignment problem in parallel), Deadlock free Packet switching, Introduction to Wave & traversal algorithms, Election algorithm. CORBA Case Study: CORBA, CORBA services.

**References:- •**

- [1]. P K Sinha, "Distributed operating systems; Concepts and design", PHI Learning.
- [2]. Sunita Mahajan & Shah, Distributed Computing, Oxford Press
- [3]. Tanenbaum and steen, "Distributed systems: Principles and paradigms", 2nd edition, PHI Learning.
- [4]. Singhal & Shivaratri, "Advanced Concept in Operating Systems", McGraw Hill
- [5]. Coulouris, Dollimore, Kindberg, "Distributed System: Concepts and Design", Pearson Ed.
- [6]. Gerald Tel, "Distributed Algorithms", Cambridge University Press List of Experiment:-
- [7]. Case Study – CORBA.

- [8]. Implementation of Deadlock through Simulation.
- [9]. Implementation of Election Algorithm.
- [10]. S/W Simulation for Clock Synchronization in Distributed System using Lamport's Algorithm.
- [11]. Implementation of Banker's Algorithm for avoiding Deadlock
- [12]. Case Study on. a) Inventory Management b) Supply Chain Management c) Reservation System d) University Counseling e) Online Chain Management.

Unit I Introduction to Raster scan displays, Storage tube displays, refreshing, flickring, interlacing, colour monitors, display processors resolution, working principle of dot matrix, inkjet laser printers, working principles of keyboard, mouse scanner, digitizing camera, track ball, tablets and joysticks, graphical input techniques, positioning techniques, rubber band techniques, dragging etc.

Unit II Scan conversion techniques, image representation, line drawing, simple DDA, Bresenham's Algorithm, Circle drawing, general method, symmetric DDA, Bresenham's Algorithm, curves, parametric function, Bezier Method, B-spline Method.

Unit III 2D & 3D Co-ordinate system, Translation, Rotation, Scaling, Reflection Inverse transformation, Composite transformation, world coordinate system, screen coordinate system, parallel and perspective projection, Representation of 3D object on 2D screen. Point Clipping. Line Clipping Algorithms, Polygon Clipping algorithms, Introduction to Hidden Surface elimination, Basic illumination model, diffuse reflection, specular reflection, phong shading, Gourand shading ray tracing, color models like RGB, YIQ, CMY, HSV etc.

Unit IV An Introduction – Multimedia applications – Multimedia System Architecture – Evolving technologies for Multimedia – Defining objects for Multimedia systems – Multimedia Data interface standards – Multimedia Databases. Multimedia components, Multimedia Hardware, SCSI, IDE, MCI, Multimedia -Tools, presentation tools, Authoring tools .

Unit V Compression & Decompression – Multimedia Data & File Format standards :-TIFF, MIDI, JPEG, DIB, MPEG,RTF, – Multimedia I/O technologies - Digital voice and audio – Video image and animation–Full motion video – Storage and retrieval technologies.

#### **References:-**

1. Donald Hearn and M.Pauline Baker, "Computer Graphics C Version", Pearson Education, 2003.
2. Prabat K Andleigh and Kiran Thakrar, "Multimedia Systems and Design", PHI Learning, 3rd Indian reprint edition, 2008.
3. Tay Vaughan, "Multimedia making it work", Tata McGraw Hill edition.
4. Amarendra N Sinha & Arun D Udai, "Computer Graphics", McGraw Hill publication
5. Fundamental of Computer Graphics and Multimedia, Mukherjee, PHI Learning

list of experiment

1. Write a program to implement DDA line drawing algorithm

2. Write a program to implement Bresenham's line drawing algorithm. Grading System 2012 - 13
3. Write a program to implement Bresenham's circle drawing algorithm.
4. Write a program to draw an ellipse using Bresenham's algorithm.
5. Write a program to perform various transformations on line, square & rectangle.
6. Write a program to implement Cohen Sutherland line clipping algorithm.
7. Write a program to implement Liang-Bersky line clipping algorithm.
8. Write a program to implement Cohen-Sutherland polygon clipping algorithm to clip a polygon with a Pattern.
9. Write a program to convert a color given in RGB space to its equivalent CMY color space.
10. Study of various Multimedia file formats: -RTF, MIDI, GIF, JPEG, MPEG, TIFF etc.
11. Write a program to implement JPEG compression scheme for still images.
12. Write a program to perform Packbits compression & decompression.
13. Write a short program to create a TIFF file using bitmap segments and text files as the TIFF File components.
14. Write a program to convert a BMP file into either JPEG or GIF file.
15. Study of various Multimedia Authoring Tools.

Unit-I Binding Protocol Address- Address Resolution Protocol & RARP, ARP & RARP , packet format, Encapsulation. Internet protocol: Introduction, Ipv4 header, Ipv4Datagrams, Encapsulation, Fragmentation and Reassembly, IP routing, Subnet addressing, Subnet mask, Supernetting- special case of IP addresses Ipv6-Motivation, frame format and addressing, comparison of Ipv4 and Ipv6.

Unit-II ICMP: Introduction, ICMP Header, ICMP message types, ICMP timestamp request and reply, trace route, ping program . Intra & inter domain routing-distance vector routing,RIP,Link State Routing,OSPF,Path Vector Routing ,BGP.Unicast Routing protocols . IGMP-IGMP message,operation,encapsulation.

Unit-III TCP: Introduction, services, headers, connection establishment and termination, timeout of connection establishment, maximum segment size- half, close, state transition diagram, port no. and socket addresses , TCP timers UDP: Introduction, UDP header, UDP checksum,UDP operations , encapsulation & decapsulation ,queuing ,SCTP-Services ,transmission sequence number,stream identifier ,stream sequence number,packet format. .

Unit-IV BOOTP:-operation ,packet format.DHCP:-Address allocation,configuration & packet Format,DNS:Distribution of name spaces , DNS in the internet . FTP:-Connection, Communication ,command processing , TFTP. E-Mail:-SMTP ,POP & IMAP . SNMP:- Management components,SMI,MIB.

Unit-V Network management applications:-Configuration management, Fault Management , Performance management , Security management , Accounting management , Report Management , policy based management .

**References:-**

- 1.“TCP/IP-Protocol suite”, Forouzan, TMH 3rd edition
- 2.“Computer Networks and Internets”, D.E.Comer, Pearson
- 3.“Network management- principles & practice” Mani Subramaniam , Pearson education.
- 4.“TCP/IP Illustrated” Volume I ,W. Richard Stevens, Addison Wesley Internetworking with TCP/IP Vol. I, II & III, Comer, PHI Learning

UNIT I History of the internet, internetworking concepts, architecture, and protocol: switch, router, protocols for internetworking, internet address and domains. Introduction World Wide Web (WWW), working of web browser and web server, Web server and its deployment, N-tier architecture, services of web server, Common gateway interface (CGI), Uniform Resource Locator (URL), format of the URL, Hyper Text Transfer Protocol (HTTP), feature of HTTP protocol HTTP request-response model, Hyper Text Transfer Protocol Secure (HTTPS).

UNIT II Introduction to Hyper Text Markup Language (HTML), HTML elements, XHTML syntax and Semantics, eXtensible Markup Language (XML), element, attributes, entity declarations. DTD files and basics of Cascading Style Sheet (CSS). Document object Model (DOM) history and levels, Document tree, DOM event handling.

UNIT III Introduction to Java Script, Basic concepts, variables and data types, functions, conditional statements, Loops, Operators, Arrays, Standard Objects and form processing in Java

UNIT IV Evaluation of web applications, type of web documents, feature of web pages, multitier web applications, introduction to Apache web server. Security in application: authentication, authorization, auditing, security issues, security on the web, proxy server, Firewall. Middleware Concepts, CORBA, Java Remote Method Invocation (RMI) , Message Oriented Middleware(MOM), EJB, Microsoft's Distributed Component Object Model(DCOM) Web Servers HTTP request types System Architecture Server side Scripting. Web server and its deployment, Web client, services of web server, mail server proxy server, multimedia server.

UNIT V Introduction to servlet, Overview Architecture Handling HTTP Request, Get and post request, redirecting request multi-tier applications. Introduction to JSP, basic JSP, Java Bean class and JSP. Setting up an Open Data Base Connectivity (ODBC) data source.

**References:-**

- 1.Web Technologies- A computer science perspective By Jeffrey C. Jackson, Pearson Education .
- 2.Web Technologies-TCP/IP Architecture, and Java Programming By Achyut S. Godbole and Atul Kahate
- 3.An introduction to Web Design+Programming by Paul S. Wang Sanda, S Katila,CENGAGE Learning.
4. Web Technology- A developer's Perspective by N.P.Gopalan, J.Akilandeswari , PHI Learning

Unit I Introduction, Software- problem and prospects Software development process: Software life cycle models, Open source software development, the unified process, documentation, configuration management, Safety, risk assessment.

Unit II Measures, Metrics and Indicators, Metrics in the Process and Project Domains, Software Measurement, Metrics of Software Quality, S/W reliability, Software estimation techniques, loc and FP estimation. Empirical models like COCOMO, project tracking and scheduling, reverse engineering.

Unit III Software requirements and specification: feasibility study, Informal/ formal specifications, pre/post conditions, algebraic specification and requirement analysis models, Specification design tools. Software design and implementation: Software design objectives, design techniques, User interface design, modularity Functional decomposition Data flow design, Data structure design, Object-oriented design, Design patterns implementation strategies like topdown, bottom-up, team etc.

Unit IV Coding standard and guidelines, programming style, code sharing, code review, software components, rapid prototyping, specialization, construction, class extensions, intelligent software agents, reuse performance improvement, debugging. Software Testing Strategies: Verification and Validation, Strategic Issues, test plan, white box, black-box testing, unit and integration testing, system testing test case design and acceptance testing, maintenance activities.

Unit V Organizing: Alternatives for project managers, matrix organization, Staffing, Directing: leadership, delegation, motivation, Controlling risk analysis and RMMM plan, project scheduling and tracking plan, SQA and quality planning, SCM activities and plan, project management plan. Re-engineering, reverse, forward engineering, web engineering, Software project management standards

**References:**

1. Software Engineering. A Practitioner's Approach by P,S. Pressman New edition McGraw.
2. Software project Management from concept to development Black Book by Kieron Conway, Dreamtech Press.
3. Software Engineering principle and practices- Deepak Jain Oxford University Press.
4. Software Engineering for students 4/e - Bell Douglas Pearson Education
5. Software Project Management, Kelkar, PHI Learning



**Objectives:** To make students well versed with at the business communication skills.

**UNIT I Essential and vocational skills: survival strategies**

- i. Managing time
- ii. Managing stress
- iii. Resilience
- iv. Work-life balance
- v. Applying soft-skills to workplace

**UNIT II Written Communication Skill Practice for:**

- i. Correction of errors
- ii. Making of Sentences
- iii. Paragraph Writing
- iv. Leave Application and simple letter writing

**UNIT III Team Building / Coordination Skills**

- i. Team Building Practices through group exercises , team task / role play
- ii. Ability to mixing & accommodation
- iii. Ability to work together

**UNIT IV Self Management**

- i. Self Evaluation
- ii. Self Discipline
- iii Self Criticism
- iv. Recognition of one's own limits and deficiencies
- v. Independency etc.
- vi. Thoughtful & Responsible
- vii. Self Awareness

**UNIT V Team Management Technique**

- i. Practice by game play & other
- ii. learning methodology for achieving
- iii targets and getting of right first time

**References**

1. Soft skills Training – A workbook to develop skills for employment by Fredrick H. Wentz
2. Personality Development and Soft skills , Oxford University Press by Barun K. Mitra
- 3.The Time Trap : the Classic book on Time Management by R. Alec Mackenzi

**Objective of GD and seminar:**

Objective of GD and seminar is to improve the MASS COMMUNICATION and CONVINCING/ Understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves.

**Evaluation** will be done by assigned faculty based on group discussion and power point Presentation.

# **DR. A P J ABDUL KALAM UNIVERSITY, INDORE**

## **Syllabus for Bachelor of Engineering**

### **Information Technology & Engineering**

#### **List of Subject (Fourth Year, Grading System)**

<b>S. No.</b>	<b>Subject Code</b>	<b>Subject name</b>	<b>Page No.</b>
<b>1</b>	IT-701	Object Oriented Analysis and Design	<b>28</b>
<b>2</b>	IT-702	Wireless & Mobile Computing	<b>30</b>
<b>3</b>	IT -703	Cloud Computing	<b>31</b>
<b>4</b>	IT -704	Elective -I	<b>32</b>
<b>5</b>	IT -705	Elective -II	<b>35</b>
<b>6</b>	HU-224P	Yoga *	<b>37</b>
<b>7</b>	IT -706	Minor Project	<b>39</b>
<b>8</b>	IT -707	Industrial Training (4 Weeks)	<b>40</b>
<b>9</b>	IT -708	Self Study (Internal Assessment Seminar / Group Discussion	<b>43</b>
<b>10</b>	IT-801T	Information Security	<b>44</b>
<b>11</b>	IT-802T	Soft Computing	<b>46</b>
<b>12</b>	IT83T	Elective -III	<b>48</b>
<b>13</b>	IT84T	Elective -IV	<b>51</b>
<b>14</b>	IT -805P	Major Project	<b>55</b>
<b>15</b>	IT -806	Self Study (Internal Assessment)	<b>56</b>
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Unit I: Overview of Object Oriented concepts: Objects and classes, abstraction, generalization and inheritance, encapsulation, multiple inheritance, aggregation abstraction classes, polymorphism, link and association, Need for object oriented approach

Unit II: System design life cycle, object oriented S/W development process model, Object Oriented Analysis, Object Modeling Technique (OMT): object model, function model, relationship among models, object diagrams, state diagrams, data flow diagrams, analysis.

Unit III: Object oriented Design: Overview of object design, Combination the models, Designing algorithms, design optimization, Implementation of control, Adjustment, Design of association, object representation, physical packaging, documenting design decision, comparison of use-case driven approach.

Unit IV: Translation Object Oriented design into implementation, Programming style, Documentation, characterization of object oriented languages, Comparison of object oriented language like C++, JAVA, object programming.

Unit V: Unified Modeling Language (UML): Class diagram sequence diagram Use case diagram, Collaboration, diagram, state, chart diagram, Activity diagram, component diagram, deployment diagram, Object oriented Database: Relational Vs .object oriented database, the architecture of object oriented database, query language for Object Oriented database.

**References:-**

- [1].Satzinger, Jackson and Burd, "Object oriented Analysis and design with the Unified Process", CENGAGE Learning.
- [2].Michael Blaha and J. Rumbaugh, "Object oriented Modeling and design with UML", Pearson Education
- [3].O'Docherty, "Object Oriented Analysis and Design Understanding, System Development with UML2.0", Wiley India.

**Experiment:-**

- [1]. Draw Object, state, Data flow Diagram of ATM.
- [2]. Draw Object, state, Data flow Diagram of Telephone Call.
- [3]. Draw Object, state, Data flow Diagram of Library Information System.
- [4]. Draw Object, state, Data flow Diagram of Airline reservation System. Draw Object, state, Data flow Diagram of Calculator.
- [5]. Draw Object, state, Data flow Diagram of College Management system.
- [6]. Draw Object, state, Data flow Diagram of Payroll System.
- [7]. Draw Object, state, Data flow Diagram of Railway Reservation system.
- [8]. Draw Object, state, Data flow Diagram of Online Sales.
- [9]. Draw Object, state, Data flow Diagram of Examination result display System of a University

Unit I: Antenna , variation pattern, antenna types, antenna gain, propagation modes, types of fading. Model for wireless digital communication, multiple access technique-SDMA, TDMA, FDMA, CDMA, DAMA, PRMA, MAC/CA, Cellular network organization, operations of cellular system, mobile radio propagation effects, , handoff, power control, sectorization, traffic engineering, Infinite sources, lost calls cleared, grade of service, poisson arrival process

Unit II: GSM- Services, system architecture, radio interface, logical channels, protocols, localization and calling, handover, security, HSCSD, GPRS-architecture, Interfaces, Channels, mobility management DECT, TETRA, UMTS.

Unit III: IEEE 802.11: LAN-architecture, 802.11 a, b and g, protocol architecture, physical layer, MAC layer , MAC management, HIPERLAN-protocol architecture, physical layer, access control sub layer, MAC sub layer. Bluetooth-user scenarios- physical layer, MAC layer.

Unit IV: Mobile IP, DHCP, Ad hoc networks: Characteristics, performance issue, routing in mobile host. Wireless sensor network, Mobile transport layer: Indirect TCP, Snooping TCP, Mobile TCP, Time out freezing, Selective retransmission, transaction oriented TCP. Introduction to WAP.

Unit V: Intruders, Intrusion detection, password management, viruses and related threads, worms, trojan horse defense, difference biometrics and authentication system, firewall design principle.

**References:-**

- [1].J. Schiller, “Mobile Communication”, Addison , Wiley William Stallng, “Wireless Communication and Network”, Pearson Education
- [2].Open Dalal,” Wireless Communication”, Oxford Higher Education
- [3].Dr. Kamilo Feher, “Wireless Digital communication”, PHI William C.Y Lee, “Mobile Communication Design Fundamental” , John Wiley

Unit-I Introduction: Historical development ,Vision of Cloud Computing, Characteristics of cloud computing as per NIST , Cloud computing reference model ,Cloud computing environments, Cloud services requirements, Cloud and dynamic infrastructure, Cloud Adoption and rudiments .Overview of cloud applications: ECG Analysis in the cloud, Protein structure prediction, Gene Expression Data Analysis ,Satellite Image Processing ,CRM and ERP ,Social networking .

Unit-II Cloud Computing Architecture: Cloud Reference Model, Types of Clouds, Cloud Interoperability & Standards, Scalability and Fault Tolerance, Cloud Solutions: Cloud Ecosystem, Cloud Business Process Management, Cloud Service Management. Cloud Offerings: Cloud Analytics, Testing Under Control, Virtual Desktop Infrastructure.

Unit –III Cloud Management & Virtualization Technology: Resiliency, Provisioning, Asset management,Concepts of Map reduce , Cloud Governance, High Availability and Disaster Recovery. Virtualization: Fundamental concepts of compute ,storage, networking, desktop and application virtualization .Virtualization benefits, server virtualization, Block and file level storage virtualization Hypervisor management software, Infrastructure Requirements , Virtual LAN(VLAN) and Virtual SAN(VSAN) and their benefits .

Unit-IV Cloud Security: Cloud Information security fundamentals, Cloud security services, Design principles, Secure Cloud Software Requirements, Policy Implementation, Cloud Computing Security Challenges, Virtualization security Management, Cloud Computing Security Architecture .

Unit-V Market Based Management of Clouds , Federated Clouds/Inter Cloud: Characterization & Definition ,Cloud Federation Stack , Third Party Cloud Services . Case study : Google App Engine, Microsoft Azure , Hadoop , Amazon , Aneka

**List of Experiments:**

1. Installation and configuration of Hadoop/Euceliptus etc.
2. Service deployment & Usage over cloud.
3. Management of cloud resources.
4. Using existing cloud characteristics & Service models .
5. Cloud Security Management. 6. Performance evaluation of services over cloud .

**Recommended Text:**

1. Buyya, Selvi ,” Mastering Cloud Computing “,TMH Pub
2. Kumar Saurabh, “Cloud Computing” , Wiley Pub
3. Krutz , Vines, “Cloud Security “ , Wiley Pub
4. Velte, “Cloud Computing- A Practical Approach” ,TMH Pub
5. Sosinsky, “ Cloud Computing” , Wiley Pub

Unit I: An overview of database, The Extended Entity Relationship Model and Object Model: The ER model revisited, Motivation for complex data types, User defined abstract data types and structured types, Subclasses, Super classes, Inheritance, Specialization and Generalization, Constraints and characteristics of specialization and Generalization, Relationship types of degree higher than two.

Unit II: Query Processing, Optimization & Database Tuning: Algorithms For Executing Query Operations. Heuristics For Query Optimizations, Estimations of Query Processing Cost, Join Strategies for Parallel Processors, Database Workloads, Tuning Decisions, DBMS Benchmarks, Clustering & Indexing, Multiple Attribute Search Keys, Query Evaluation Plans, Pipelined Evaluations, System Catalogue in RDBMS.

Unit III: Distributed Database System: Structure of Distributed Database, Data Fragmentation, Data Model, Query Processing, Semi Join, Parallel & Pipeline Join, Distributed Query Processing In R \* System, Concurrency Control In Distributed Database System, Recovery In Distributed Database System, Distributed Deadlock Detection and Resolution, Commit Protocols.

Unit IV: Enhanced Data Model For Advanced Applications: Database Operating System, Introduction to Temporal Database Concepts, Spatial And Multimedia Databases, Data Mining, Active Database System, Deductive Databases, Database Machines, Web Databases, Advanced Transaction Models, Issues in Real Time Database Design.

Unit V: Accessing databases from Web, JavaScript, JDBC, Java Servlets , database technology to Web related areas such as semi-structured databases and data integration, XML, XQuery, XPath, XML Schemas, distributed database design, distributed database transactions, and distributed query processing

**References:-**

- [1]. Majumdar & Bhattacharya, "Database Management System", TMH.
- [2]. Elmasri, Navathe, "Fundamentals of Database Systems", Addison Wesley.
- [3]. Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill.
- [4]. David M. Croenke and David J. Auer "Database Processing" Eleventh Edition, PHI
- [5]. Ramakrishnan, Gehrke, "Database Management System", McGraw Hill.
- [6]. Peter Rob and Coronel, "Database Systems, Design, Implementation and Management", Cengage Learning Data
- [7]. C J," An Introduction To Database System", Addison Wesley.
- [8]. Bernstein, Hadzilacous, Goodman, "Concurrency Control & Recovery", Addison Wesley



Unit I: PHYSICAL MODELING: Concept of system and environment, continuous and discrete system, linear and nonlinear system, stochastic activities, static and dynamic models, principles used in modeling, Basic simulation modeling, Role of simulation in model evaluation and studies, Advantages and Disadvantages of simulation. Modeling of systems, Iconic, analog and Mathematical Modeling.

Unit II: COMPUTER BASED SYSTEM SIMULATION: Technique of simulation, Monte Carlo method, experimental nature of simulation, numerical computation techniques, calumnious system models, analog and hybrid simulation, feedback systems, Buildings simulation models- Financial Model for an office Building, Sensitivity analysis for office building Model.

Unit III: SYSTEM DYNAMICS MODELING: Identification of problem situation, Exponential Growth Model and Decay Model, Logistic Curve, System Dynamic Diagrams, Simulation of System Dynamics Waiting Times in Single Server Queuing System.

Unit IV: PROBABILITY CONCEPTS IN SIMULATION: Stochastic variables, discrete and continuous probability functions, Distributed Random numbers, generation of random numbers-Uniform and Non Uniform Random numbers, variance reduction techniques-Introduction, Common Random numbers Rationale, Applicability and Synchronization.

Unit V: SIMULATION SOFTWARE: Introduction, Comparison of Simulation Package with Programming Languages, Classification of Simulation Software, Desirable Software features, General Purpose Simulation Package-ARENA, EXTEND, Study of SIMULA, DYNAMO,

**References:-**

- [1]. Gordon G., "System simulation", Printice Hall.
- [2]. Averill M Law " Simulation Modeling and Analysis", TMH
- [3]. Seila, Ceric and Tadikamalla " Applied Simulation Modeling", Cengage Learning.
- [4]. Severance" System Modelling & Simulation : An Introduction", John Wiley
- [5]. Payer T., "Introduction to system simulation", McGraw Hill.
- [6]. Allan Carrie, "Simulation and Modeling", McGraw Hill

Unit I: Introduction: Alphabets, Strings and Languages; Automata and Grammars, Deterministic finite Automata (DFA)-Formal Definition, Simplified notation: State transition graph, Transition table, Language of DFA, Nondeterministic finite Automata (NFA), Equivalence of NFA and DFA, Minimization of Finite Automata, Regular Expressions, Arden's theorem.

Unit II: Compiler Structure: Compilers and Translators, Various Phases of Compiler, Pass Structure of Compiler, Bootstrapping of Compiler. Lexical Analysis: The role of Lexical Analyzer, A simple approach to the design of Lexical Analyzer, Implementation of Lexical Analyzer. The Syntactic Specification of Programming Languages: CFG, Derivation and Parse tree, Ambiguity, Capabilities of CFG. Basic Parsing Techniques: Top-Down parsers with backtracking, Recursive Descent Parsers, Predictive Parsers,

Unit III: Bottom-up Parsers, Shift-Reduce Parsing, Operator Precedence Parsers, LR parsers (SLR, Canonical LR, LALR) Syntax Analyzer Generator: YACC, Intermediate Code Generation: Different Intermediate forms: three address code, Quadruples & Triples. Syntax Directed translation mechanism and attributed definition. Translation of Declaration, Assignment, Control flow, Boolean expression, Array References in arithmetic expressions, procedure calls, case statements, postfix translation.

Unit IV: Run Time Memory Management: Static and Dynamic storage allocation, stack based memory allocation schemes, Symbol Table management Error Detection and Recovery: Lexical phase errors, Syntactic phase errors, Semantic errors.

Unit V: Code Optimization and Code Generation: Local optimization, Loop optimization, Peephole optimization, Basic blocks and flow graphs, DAG, Data flow analyzer, Machine Model, Order of evaluation, Register allocation and code selection

#### References:-

- [1]. Louden, "Compiler construction", Cengage learning .
- [2]. Alfred V Aho, Jeffrey D. Ullman, "Principles of Compiler Design", Narosa. A.V. Aho, R. Sethi and J.D Ullman, "Compiler: principle, Techniques and Tools", AW.
- [3]. Michal Sipser, "Theory of Computation", Cengage learning.
- [4]. H.C. Holub, "Compiler Design in C", Prentice Hall Inc.
- [5]. Hopcroft, Ullman, "Introduction to Automata Theory, Languages and Computation", Pearson Education. K.L.P. Mishra and N.Chandrasekaran, "Theory of Computer Science : Automata, Languages and Computation", PHI

Unit I: Introduction to high performance computing: Aim, Architectures, Cluster, Grid, Meta-computing, Middleware, Examples of representative applications. Programming models: Parallel programming paradigms, task partitioning and mapping, shared memory, message passing, peer-to-peer, broker-based. Introduction to PVM and MPI.

Unit II: Architecture of cluster-based systems, Issues in cluster design: performance, single-system-image, fault tolerance, manageability, programmability, load balancing, security, storage. High performance sequential computing: Effects of the memory hierarchy, Out-of-order execution, superscalar processors, Vector processing.

Unit III: Shared-memory processing: Architectures (extensions of the memory hierarchy), Programming paradigms, OpenMP. Distributed-memory processing: Architectural issues (networks and interconnects), Programming paradigms, MPI (+MPI2).

Unit IV: Grids: Computational grids, Data grids ,Architecture of Grid systems, Grid security infrastructure. Examples of Grids: Globus. The productivity crisis & future directions: Development overheads, Petaflops programming, New parallel languages: UPC, Titanium, Co-Array FORTRAN.

Unit V: Performance Issues and Techniques: Cost and Frequency Models for I/O, paging, and caching. Notion of Cacheing; temporal and spatial locality models for instruction and data accesses; Intra-process parallelism and pipelining. Typical Compiler Optimizations of Programs; Improving Performance: Identifying program bottlenecks - profiling, tracing; simple high-level-language optimizations - locality enhancement, memory disambiguation, moving loop-invariants.

#### References:-

- [1]. Charles Severance, Kevin Dowd, O'reilly, "High Performance Computing", Second Edition July 1998
- [2]. David j. Kuck, "High Performance Computing", Oxford Univ Pr, 1996
- [3]. Gary W. Sabot, "High Performance Computing ", Addison-Wesley, 1995
- [4]. Dowd K, "High Performance Computing", O' Reilly Series, 1993.
- [5]. R.E. Bryant and D. O'Hallaron, "Computer Systems:A Programmer's Perspective", Pearson Education, 2003.

Unit I: Introduction to bioinformatics: Definition and History of Bioinformatics, Application and research of bioinformatics, finding Bioinformatics data online Bioinformatics, private and future data sources, Meta data Summary and reference systems.

Unit II: Bioinformatics Database: Characteristics and categories of Bioinformatics database, Navigating databases, Information retrieval Systems, Sequence database Nucleotide(primary and Secondary), Protein sequence, Structure Databases: File Formats, Protein Structure, PDB, MMDB, CATH, Other Database Enzyme, MEROPS, BRENDA, Pathway databases

Unit III: Bioinformatics Tools: Need for tools, Industry Trends, Data Mining Tools, Data Submission tools: Nucleotide Sequence, protein Submission tools, Data Analysis tools: Nucleotide Sequence, protein Sequence, Prediction Tools: Phylogenetic trees, Gene prediction, Protein Structure and Function prediction, Modeling Tools: 2D and 3D Protein Modeling.

Unit IV: Bioinformatics Algorithms: Classification of Algorithms, Biological Algorithm, Sequence Comparison Algorithm, Substitution Matrices Algorithms, Sequence Alignment Algorithm ,Gene Prediction Algorithm.

Unit V: Bioinformatics Software: Local Alignment Search Tool (BLAST),Purpose of BLAST,BLAST Analysis, Purpose of BLAST II, Scoring Metrics, PAM, BLOSUM, Working of BLAST. Introduction of HMMER, Practical example of HMMER.

**References:-**

- [1].Orpita Bosu and Simminder Kaur Thukral, "Bioinformatics Databases,Tools and Algorithms", Oxford University Press 2007.
- [2].Harshawardhan P.bal, "Bioinformatics Principle and Applications", TMH.
- [3].Lesk, A.M.2002, "Introduction to Bioinformatics", Oxford University Press.
- [4].Rastogi, S.C. ,Mendiratta N, "Bioinformatics Concepts,Skill & Applications", CBS Publishers.
- [5].Claverie, J.M and Notredame C, "Bioinformatics for Dummies", Wiley Editor.

Unit I: Introduction to e-commerce: 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.

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 nation wide networking in e-governance, e-seva.

Unit V: E-Government 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.

**Objective:** To develop physical fitness and mental peace among students

#### **UNIT I**

**YOG & PRANAYAM::**Introduction, benefits of pranayam, Asan

#### **UNIT II**

Meditation – Agnai, Asanas, Kiriyaas, Bandas, Muthras, benefits of Agnai Meditation

#### **UNIT III**

Benefits of santhi Meditation Kayakalpa Yoga Asanas, Kiriyaas, Bandas, Muthras  
Meditation Santhi

#### **UNIT IV**

Meditation Thuriyam Kayakalpa Asanas, Kiriyaas, Bandas, Muthras Benefits of  
Thuriyam

#### **UNIT V**

Meditation Thuriyam Kayakalpa Asanas, Kiriyaas, Bandas, Importance of Arutkappy &  
muhurtas Meditation Santhi Kayakalpa Asanas, Kiriyaas, Bandas, Muthras

#### **UNIT VI NATIONAL SPORTS ORGANISATION (NSO)**

Each student must select two of the following games and practice for two hours per week. An attendance of 80% is compulsory to earn the credits specified in the curriculum. List of games:

- Basket Ball
- Football
- Volley Ball
- Badminton
- Cricket
- Throw ball

#### **References**

1. Prāṇāyāma Rahasya Book by Ramdev
2. Sampooran Yog Vidhya by Rajiv Jain Trilok
3. Light on Yoga: The Classic Guide to Yoga by the World's Foremost Authority by B.K.S. Iyengar

Provision of Minor project is made as preparation phase-I for major project or to take it as an independent small project.

The objectives of the course 'Minor Project' are

- To provide students with a comprehensive experience for applying the knowledge gained so far by studying various courses.
- To develop an inquiring aptitude and build confidence among students by working on solutions of small industrial problems.
- To give students an opportunity to do something creative and to assimilate real life work situation in institution.
- To adapt students for latest developments and to handle independently new situations.
- To develop good expressions power and presentation abilities in students.

The focus of the Major Project is on preparing a working system or some design or understanding of a complex system using system analysis tools and submit it the same in the form of a write-up i.e. detail project report. The student should select some real life problems for their project and maintain proper documentation of different stages of project such as need analysis, market analysis, concept evaluation, requirement specification, objectives, work plan, analysis, design, implementation and test plan. Each student is required to prepare a project report and present the same at the final examination with a demonstration of the working system (if any).

The faculty and student should work according to following schedule:

- i) Each student undertakes substantial and individual project in an approved area of the subject and supervised by a member of staff.
- ii) The student must submit outline and action plan for the project execution (time schedule) and the same be approved by the concerned faculty.
- iii) At all the steps of the project, students must submit a written report of the same.

Marks of various components in industry should be awarded to the students, in consultations with the Training and Placement Officer/Faculty of Institute, Who must establish contact with the supervisor/Authorities of the organisation where, students have taking training to award the marks for term work and I/c of training from Industry. During training students will prepare a first draft of training report in consultation with section in-charge. After training they will prepare final draft with the help of T.P.O./Faculty of the institute. Then they will present a seminar on their training and they will face viva-voce on training in the institute.

### **1.1 OBJECTIVE OF INDUSTRIAL TRAINING**

The objective of undertaking industrial training is to provide work experience so that student's engineering knowledge is enhanced and employment prospects are improved. The student should take this course as a window to the real World of Work and should try to learn as much as possible from real life experiences by involving and interacting with industry staff. Industrial training also provides an opportunity to students to select an engineering problem and possibly an industry guide for their Major Project in final semester. Industrial training of the students is essential to bridge the wide gap between the classroom and industrial environment. This will enrich their practical learning and they will be better equipped to integrate the practical experiences with the classroom learning process.

### **1.2 LEARNING THROUGH INDUSTRIAL TRAINING**

During industrial training students must observe following to enrich their learning:

- Industrial environment and work culture.
- Organisational structure and inter personal communication.
- Machines/ equipment/ instruments - their working and specifications.
- Product development procedures and phases.
- Project planning, monitoring and control.
- Quality control and assurance.
- Maintenance system.
- Costing system.
- Stores and purchase systems.
- Layout of Computer/ EDP/MIS centres.
- Roles and responsibilities of different categories of personnel.
- Customer services.
- Problems related to various areas of Work etc.



Faculty and TPO are supposed to plan industrial training in such a manner that students get exposure on most of the above arena in the field (world of work). Students are supposed to acquire the knowledge on above by -

1. Observation,
2. Interaction with officials at the workplace
3. Study of Literature at the workplace (e.g. User Manual, standards, maintenance schedules, etc.)
4. "Hand's on" experience
5. Undertaking / assisting project work.
6. Solving problems at the work place.
7. Presenting a seminar.
8. Participating in-group meeting/ discussion.
9. Gathering primary and secondary data/ information through various sources, Storage, retrieval and analysis of the gathered data.
10. Assisting officials and managers in their working.
11. Undertaking a short action research work.
12. Consulting current technical journals and periodicals in the library.
13. Discussions with peers.

### **1.3 GUIDANCE TO THE FACULTY/TPO FOR PLANNING AND IMPLEMENTING THE INDUSTRIAL TRAINING**

The industrial training programme, which is spread to 4 weeks' duration, has to be designed in consultation with the authorities of the work place, keeping in view the need of the contents. Following are some of the salient points:

- Spelling out the objectives of the industrial training in behavioral terms and same is informed in advance to the 1) students, 2) authorities of the work place and 3) supervising faculty members.
- Discussing and preparing students for the training for which meetings with the students has to be planned.
- Meeting with industrial personnel and orienting them regarding the objective of the training and the expectations of the programme.
- Correspondence with the authorities of the work place. Orientation classes for students on how to make the training most beneficial - monitoring daily diary, writing weekly reports, how to interact with various categories of industrial personnel, how to behave and undertake responsibilities, how to gather information from the workplace, ethics etc.
- Guiding students to make individual plans (week wise/ day wise) to undertake industrial training

- Developing a system of maintaining training records, by teachers for every batch of students for convenient retrieval.
- Inviting industrial personnel to deliver lectures on some aspects of training.

#### 1.4 ACTION PLAN FOR PLANNING STAGES AT THE INSTITUTION LEVEL

S.No.	Activity Commencing	Week Finishing week	Remarks
1.	Meeting with Principal		
2.	Meeting with Colleagues		
3.	Correspondence with work place(Industries concerned)		
4.	Meeting with authorities ofwork place		
5.	Orientation of students for industrial training		
6.	Scrutinizing individual training plan of students		
7.	Commencement of industrial training		
8.	First monitoring of industrial training		
9.	Second monitoring of industrial training		
10.	Finalization of Training report		
11.	Evaluation of performance at Industry level		
12.	Evaluation of industrial programme in the institution.		

#### 1.5 INDUSTRIAL TRAINING DAILY DIARY

Name of the Trainee:.....College:.....  
 Industry/Work place:.....Week  
 No.:.....  
 Department/Section:.....Date:.....

Dates Brief of observations made, work done, problem/project undertaken, discussion held,literature-consulted etc.

**Objective of Self study and seminar:**

Objective of Self study and seminar is to improve the mass communication and convincing/ Understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves.

**Evaluation** will be done by assigned faculty based on group discussion and power point Presentation.

Unit I: Basic of Cryptography, secret key cryptography, Types of attack, Substitution ciphers, Transposition ciphers, block ciphers and steam ciphers, Confusion and Diffusion, Data encryption standard, round function, modes of operation, cryptanalysis, brute force attack, Security Goals (Confidentiality, Integrity, Availability).

Unit II: Public key Cryptography, Modulo arithmetic, Greatest common divisor, Euclidean algorithm, RSA algorithm, hash function, attack on collision resistance, Diffie hellman key exchange, Digital signature standard, elliptic curve cryptography.

Unit III: Authentication: One way Authentication, password based, certificate based, Mutual Authentication ,shared secret based, Asymmetric based, Authentication and key agreement, centralized Authentication, eavesdropping, Kerberos, IP security overview:- security association & Encapsulating security payload ,tunnel and transfer modes, internet key exchange protocol, Secure Socket Layer(SSL), Transport Layer Security (TLS).

Unit IV: Software vulnerabilities: Phishing Attacks, buffer overflow vulnerability, Format String attack, Cross Site Scripting, SQL injection Attacks, Email security:- Security services of E-mail ,Establishing keys, Privacy ,Authentication of the source, Message integrity ,Non-Repudiation, Viruses, Worms, Malware.

Unit V: Web Issue: Introduction, Uniform Resource Locator/uniform resource identify, HTTP, Cookies, Web security problem, Penetration Testing, Firewalls:- functionality, Polices and Access Control, Packet filters, Application level gateway, Encrypted tunnel, Security architecture, Introduction to intrusion detection system.

**References:-**

- [1]. Bernard Menezes, “ Network Security and Cryptography”, CENGAGE Learning.
- [2]. Charlie Kaufman, “ Network Security”, PHI. Forouzan, “Cryptography & Network Security”, TMH
- [3]. Randy Weaver, “ Network Infrastructure Security”, Cengage Learning.
- [4]. Atual Kahate, “ Cryptography and Network Security”, TMH.
- [5]. William Stallng, “ Cryptography and Network security”, Pearson.

**List of Experiment:-**

- [1]. Study of Network Security fundamentals - Ethical Hacking, Social Engineering practices.
- [2]. System threat attacks - Denial of Services.
- [3]. Sniffing and Spoofing.
- [4]. Web Based Password Capturing.
- [5]. Virus and Trojans.
- [6]. Anti-Intrusion Technique – Honey pot.
- [7]. Symmetric Encryption Scheme – RC4.
- [8]. Block Cipher – S-DES, 3-DES
- [9]. Asymmetric Encryption Scheme – RSA.
- [10]. IP based Authentication.

Unit I: Introduction to Neural Network: Concept, biological neural network, evolution of artificial neural network, McCulloch-Pitts neuron models, Learning (Supervised & Unsupervised) and activation function, Models of ANN-Feed forward network and feed back network, Learning Rules Hebbian, Delta, Perceptron Learning and Windrow-Hoff, winner take all.

Unit II: Supervised Learning: Perceptron learning, - Single layer/multilayer, linear Separability, Adaline, Madaline, Back propagation network, RBFN. Application of Neural network in forecasting, data compression and image compression.

Unit III: Unsupervised learning: Kohonen SOM (Theory, Architecture, Flow Chart, Training Algorithm) Counter Propagation (Theory, Full Counter Propagation NET and Forward only counter propagation net), ART (Theory, ART1, ART2). Application of Neural networks in pattern and face recognition, intrusion detection, robotic vision.

Unit IV: Fuzzy Set: Basic Definition and Terminology, Set-theoretic Operations, Member Function, Formulation and Parameterization, Fuzzy rules and fuzzy Reasoning, Extension Principal and Fuzzy Relations, Fuzzy if-then Rules, Fuzzy Inference Systems. Hybrid system including neuro fuzzy hybrid, neuro genetic hybrid and fuzzy genetic hybrid, fuzzy logic controlled GA. Application of Fuzzy logic in solving engineering problems.

Unit V: Genetic Algorithm: Introduction to GA, Simple Genetic Algorithm, terminology and operators of GA (individual, gene, fitness, population, data structure, encoding, selection, crossover, mutation, convergence criteria). Reasons for working of GA and Schema theorem, GA optimization problems including JSP (Job shop scheduling problem), TSP (Travelling salesman problem), Network design routing, timetabling problem. GA implementation using MATLAB.

#### References:-

- [1]. S.N. Shivnandam, "Principle of soft computing", Wiley.
- [2]. S. Rajshekar and G.A.V. Pai, "Neural Network, Fuzzy logic And Genetic Algorithm", PHI.
- [3]. Jack M. Zurada, "Introduction to Artificial Neural Network System" JAico Publication.
- [4]. Simon Haykins, "Neural Network- A Comprehensive Foudation" Timothy J.
- [5]. Ross, "Fuzzy logic with Engineering Applications", McGraw-Hills .

### List of Experiment:-

- [1]. Form a perceptron net for basic logic gates with binary input and output
- [2]. Using Adaline net, generate XOR function with bipolar inputs and targets.
- [3]. Calculation of new weights for a Back propagation network, given the values of input
- [4]. pattern, output pattern, target output, learning rate and activation function.
- [5]. Construction of Radial Basis Function Network.
- [6]. Use of Hebb rule to store vector in auto associative neural net.
- [7]. Use of ART algorithm to cluster vectors.
- [8]. Design fuzzy inference system for a given problem.
- [9]. Maximize the function  $y = 3x^2 + 2$  for some given values of x using Genetic algorithm.
- [10]. Implement Travelling salesman problem using Genetic Algorithm.
- [11]. Optimisation of problem like Job shop scheduling using Genetic algorithm

Unit I: Introduction to Component Based Development: Definition of Software Component and its Elements, The Component Industry Metaphor, Component Models and Component Services: Concepts and Principles, An Example Specification for Implementing a Temperature Regulator Software Component.

Unit II: Case for Components: The Business Case for Software Components, COTS Myths and Other Lessons Learned in Component-Based Software Development, Roles for Component-Based Development, Common High Risk Mistakes in Component-Based Software Engineering, CBSE Success Factors: Integrating Architecture, Process, and Organization

Unit III: Software Component Infrastructure: Software Components and the UML, Component Infrastructures: Placing Software Components in Context, Business Components, Components and Connectors: Catalysis Techniques for Defining Component Infrastructures, an Open Process for Component-Based Development, Designing Models of Modularity and Integration.

Unit IV: Management of CBD: Measurement and Metrics for Software Components, The Practical Reuse of Software Components, Selecting the Right COTS Software: Why Requirements are important, Build vs. Buy, Software Component Project Management Processes, The Trouble with Testing Software Components, Configuration Management and Component Libraries, The Evolution, Maintenance and Management of Component-Based Systems

Unit V: Component Technologies: Overview of the CORBA Component Model, Transactional COM+ Designing Scalable Applications, The Enterprise JavaBeans Component Model, Choosing Between COM+, EJB, and CCM, Software Agents as Next Generation Software Components,

**References:-**

- [1]. Component Software ,Clemens Szyperski, Addison-Wesley Professional; 2 edition ,, 2002,ISBN-10: 0201745720, ISBN-13: 978-0201745726
- [2].Component-Based Software Engineering: Putting the Pieces Together George T.Heineman, William T.Councill, Addison-Wesley Professional, 2001 ISBN 1`0: 0201704854,ISBN-13:9780201704853
- [3]. G Sudha Sadasioam, "Computer-based Technology", Wiley India, 1st Edition 2008



Unit I: Image representation, fundamental steps in image processing, image model. Sampling & quantization. Neighbors of a pixel, connectivity and distance measures. Basic transformations and perspective transformations. Two dimensional Fourier transform, Discrete Fourier transform and their properties. Fast Fourier transform, Walsh Transform, Hadamard transform and Discrete Cosine transform.

Unit II: Image Enhancement: Intensity transformations, histogram processing, Image subtraction, image averaging, Spatial filtering-smoothing and sharpening filters, frequency domain filtering methods-low pass filtering, high pass filtering, median filtering.

Unit III: Image compression: Redundancy and its types. Image compression model, variable length coding, bit plane coding, constant area coding, run length coding, lossless and lossy predictive coding, transform coding.

Unit IV: Image restoration and Segmentation: Degradation model, effect of diagonalisation on degradation, algebraic approach. Detection of discontinuities by point, line and edge detection. Edge linking, graph theoretic techniques, thresholding techniques, region oriented segmentation.

Unit V: Representation & Description: Chain codes, polygonal approximations, signatures, boundary segments, skeleton, boundary descriptors, shape descriptors regional descriptors, image morphology-dilation, erosion, opening, closing, thickening, thinning, skeleton, pruning,, hit or miss transform.

**References:-**

- [1]. R.C Gonzalez & Richard E Wood, "Digital Image Processing" ,Addison Wesley Publishing
- [2]. Anil K Jain, "Fundamentals of Digital image processing". PHI.
- [3]. Sonka, Hlavac, Boyle, "Digital image processing and computer vision", cengage learning, India Edition.
- [4]. B Chanda, D. Dutta Majumder, "Digital image Processing and Analysis", PHI

Unit I: Meaning and definition of artificial intelligence, Various types of production systems, Characteristics of production systems, Study and comparison of breadth first search and depth first search. Techniques, other Search Techniques like hill Climbing, Best first Search. A\* algorithm, AO\* algorithms etc, and various types of control strategies.

Unit II: Knowledge Representation, Problems in representing knowledge, knowledge representation using propositional and predicate logic, comparison of propositional and predicate logic, Resolution, refutation, deduction, theorem proving, inferencing, monotonic and nonmonotonic reasoning.

Unit III: Probabilistic reasoning, Baye's theorem, semantic networks, scripts, schemas, frames, conceptual dependency, fuzzy logic, forward and backward reasoning.

Unit IV: Game playing techniques like minimax procedure, alpha-beta cut-offs etc, planning, Study of the block world problem in robotics, Introduction to understanding and natural languages processing.

Unit V: Introduction to learning, Various techniques used in learning, introduction to neural networks, applications of neural networks, common sense, reasoning, some example of expert systems.

**References:-**

[1]. Rich E and Knight K, "Artificial Intelligence", TMH, New Delhi.

[2]. Nelsson N.J., "Principles of Artificial Intelligence", Springer Verlag, Berlin

Unit I: Introduction :Introduction-Fundamentals of Wireless Communication Technology, The Electromagnetic Spectrum, GSM, GPRS, PCS, WLAN and UMTS, Components of Packet Radios, Routing in PRNETs, Route calculation, Pacing techniques, Ad Hoc Wireless Networks, Heterogeneity in Mobile Devices, Wireless Sensor Networks, Traffic Profiles, Types of Ad Hoc Mobile Communications, Types of Mobile Host Movements, Challenges Facing Ad Hoc Mobile Networks.

Unit II: Ad Hoc wireless MAC protocols- Introduction, Synchronous and asynchronous MAC protocols, Problem in Ad Hoc channel access, Receiver-initiated and sender-initiated MAC protocols, Existing Ad Hoc MAC protocols, Ad Hoc Routing Protocols- Introduction, Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks, Classifications of Routing Protocols: Table-Driven Routing Protocols – Destination Sequenced Distance Vector (DSDV), Wireless Routing Protocol (WRP), Cluster Switch Gateway Routing (CSGR), Source-Initiated On-Demand Approaches - Ad Hoc On-Demand Distance Vector Routing (AODV), Dynamic Source Routing (DSR), Temporally Ordered Routing Algorithm (TORA), Signal Stability Routing (SSR) LocationAided Routing (LAR), Power-Aware Routing (PAR), Zone Routing Protocol (ZRP).

Unit III: Multicast routing In Ad Hoc Networks : Introduction, Issues in Designing a Multicast Routing Protocol, Operation of Multicast Routing Protocols, An Architecture Reference Model for Multicast Routing Protocols, Classifications of Multicast Routing Protocols, Tree-Based Multicast Routing Protocols, Mesh- Based Multicast Routing Protocols, Summary of Tree-and Mesh-Based Protocols - Energy-Efficient Multicasting, Multicasting with Quality of Service Guarantees, Application Dependent Multicast Routing, Comparisons of Multicast Routing Protocols.

Unit IV: Transport Layer, Security Protocols : Introduction, Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks, Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks, Classification of Transport Layer Solutions, TCP Over Ad Hoc Wireless Networks, Other Transport Layer Protocols for Ad Hoc Wireless Networks, Security in Ad Hoc Wireless Networks, Network Security Requirements, Issues and Challenges in Security Provisioning, Network Security Attacks, Key Management, Secure Routing in Ad Hoc Wireless Networks.

Unit V: QoS and Energy Management : Introduction, Issues and Challenges in Providing QoS in Ad Hoc Wireless Networks, Classifications of QoS Solutions, MAC Layer Solutions, Network Layer Solutions, QoS Frameworks for Ad Hoc Wireless Networks, Energy Management in Ad Hoc Wireless Networks – Introduction, Need for Energy Management in Ad Hoc Wireless Networks, Classification of Energy Management Schemes, Battery Management Schemes, Transmission Power Management Schemes, System Power Management Schemes.

### **References Books:-**

- [1]. C. Siva Ram Murthy and B.S. Manoj “Ad Hoc Wireless Networks: Architectures and Protocols”, Pearson Education.
- [2]. C.K. Toh, “Ad Hoc Mobile Wireless Networks: Protocols and Systems”, Pearson Education.
- [3]. George Aggelou, “Mobile Wireless Networks”, Tata McGraw- Hill.
- [4]. Charles E. Perkins, Ad Hoc Networking, Pearson Education.

Unit I: Data Warehousing: Need for data warehousing , Basic elements of data warehousing, Data Mart, Data Warehouse Architecture, extract and load Process, Clean and Transform data, Star ,Snowflake and Galaxy Schemas for Multidimensional databases, Fact and dimension data, Partitioning Strategy-Horizontal and Vertical Partitioning.

Unit II: Data Warehouse and OLAP technology, Multidimensional data models and different OLAP Operations, OLAP Server: ROLAP, MOLAP, Data Warehouse implementation ,Efficient Computation of Data Cubes, Processing of OLAP queries, Indexing data.

Unit III: Data Mining: Data Preprocessing ,Data Integration and Transformation, Data Reduction, Discretizaion and Concept Hierarchy Generation , Basics of data mining, Data mining techniques, KDP (Knowledge Discovery Process), Application and Challenges of Data Mining, Introduction of Web Structure Mining, Web Usage Mining, Spatial Mining, Text Mining, Security Issue, Privacy Issue, Ethical Issue.

Unit IV: Mining Association Rules in Large Databases: Association Rule Mining, SingleDimensional Boolean Association Rules, Multi-Level Association Rule, Apriori Algorithm, FpGrowth Algorithm, Time series mining association rules, latest trends in association rules mining.

Unit V: Classification and Clustering Distance Measures, Types of Clustering, K-Means Algorithm, Decision Tree Induction, Bayesian Classification, Association Rule Based, Other Classification Methods, Prediction, Classifier Accuracy, Categorization of methods, Partitioning methods, Outlier Analysis.

**Reference:-**

- [1]. P.Ponnian, "Data Warehousing Fundamentals", John Weliey.
- [2]. Han,Kamber, "Data Mining Concepts & Techniques", M.Kaufman.
- [3]. M.H.Dunham, "Data Mining Introductory & Advanced Topics", Pearson Education.
- [4]. Ralph Kimball, "The Data Warehouse Lifecycle Tool Kit", John Wiley.
- [5]. M.Berry , G.Linoff, "Master in Data Mining", John Wiley.
- [6]. W.H.Inmon, "Building the Data Ware houses", Wiely Dreamtech.
- [7]. E.G. Mallach , "The Decision Support & Data Warehouse Systems", TMH

Unit I: Cyber world: an overview, internet and online resources, security of information, digital signature, intellectual property (IP), historical background of IP, IPR governance, National patent offices, the world intellectual property organization (WIPO).

Unit II: Introduction about the cyber space, cyber law, regulation of cyber space, scope of cyber laws: ecommerce; online contracts; IPRs (copyright, trademarks and software patenting), taxation; e-governance and cyber crimes, cyber law in India with special reference to Information Technology Act, 2000.

Unit III: Introduction to computer and cyber crimes. Cyber crimes and related concepts, distinction between cyber crimes and conventional crimes, Cyber criminals and their objectives. Kinds of cyber crimes cyber stalking; cyber pornography, forgery and fraud, crime related to IPRs, cyber terrorism; computer vandalism etc. Cyber forensics, computer forensics and the law, forensic evidence, computer forensic tools.

Unit IV: Regulation of cyber crimes, Issues relating to investigation, issues relating to jurisdiction, issues relating to evidence, relevant provisions under Information Technology Act 2000, Indian penal code, pornography Act and evidence Act etc.

Unit V: Copyright issues in cyberspace: linking, framing, protection of content on web site, international treaties, trademark issues in cyberspace: domain name dispute, cyber squatting, uniform dispute resolution policy, computer software and related IPR issues.

**References:-**

- [1]. Nelson, Phillips, "Computer Forensics and Investigations", Cengage Learning India.
- [2]. Vinod V. Sople, "Managing Intellectual Property" PHI Learning Private Limited.
- [3]. Dr. R.K. Tiwari, P.K. Sastri, K.V. Ravikumar, "Computer crime and Computer Forensics", First Edition 2002, Select publishers.
- [4]. NIIT, Understanding Forensics in IT, PHI Learning.
- [5]. IT Act 2000 Details [www.mit.gov.in](http://www.mit.gov.in)
- [6]. Simpson, "Ethical Hacking and Network Defense", Cengage Learning India

The objectives of the course 'Major Project' are

- To provide students with a comprehensive experience for applying the knowledge gained so far by studying various courses.
- To develop an inquiring aptitude and build confidence among students by working on solutions of small industrial problems.
- To give students an opportunity to do some thing creative and to assimilate real life work situation in institution.
- To adapt students for latest developments and to handle independently new situations.
- To develop good expressions power and presentation abilities in students.

The focus of the Major Project is on preparing a working system or some design or understanding of a complex system using system analysis tools and submit it the same in the form of a write-up i.e. detail project report. The student should select some real life problems for their project and maintain proper documentation of different stages of project such as need analysis, market analysis, concept evaluation, requirement specification, objectives, work plan, analysis, design, implementation and test plan. Each student is required to prepare a project report and present the same at the final examination with a demonstration of the working system (if any).

The faculty and student should work according to following schedule:

- i) Each student undertakes substantial and individual project in an approved area of the subject and supervised by a member of staff.
- ii) The student must submit outline and action plan for the project execution (time schedule) and the same be approved by the concerned faculty.
- iii) At all the steps of the project, students must submit a written report of the same.

**Objective of Self study and seminar:**

Objective of Self study and seminar is to improve the MASS COMMUNICATION and CONVINCING/ Understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves.

**Evaluation** will be done by assigned faculty based on group discussion and power point Presentation.