Advanced web technology & Dot Net

Unit I **Introduction :** The World Wide Web: WWW Architecture , Web Search Engines , Web crawling ,Web indexing , Web Searching , Search engines optimization and limitations; Introduction to the semantic web(RDF, OWL)

Unit II **Introduction to .NET framework :** Evolution of .NET , Comparison of Java and .NET, Architecture of .NET framework , Common Language Runtime , Common Type System , Metadata , Assemblies , Application Domains , CFL , Features of .NET , Advantages and Application

Unit III **C# :** Basic principles of object oriented programming ,,Basic Data Types, Building Blocks- Control Structures, operators, expressions, variables, Reference Data Types- Strings , Data time objects, Arrays, Classes and object, Exception Handling, Generics, File Handling, Inheritance and Polymorphism, Database programming

Unit IV **Web Applications in ASP.NET :** ASP.Net Coding Modules, ASP.NET Page Directives, Page events and Page Life Cycle , PostBack and CrossPage Posting , ASP.Net Application Compilation models , ASP.NET server Controls , HTML Controls, Validation Controls, Building Databases **Introduction to JQuery :** What is jQuery? JavaScript vsjQuery , How to use jQuery in ASP.NET?

Unit V **Managing State :** Preserving State in Web Applications , Page-Level State , Using Cookies to Preserve State , ASP.NET Session State , Storing Objects in Session State , Configuring Session State , Setting Up an Out-of-Process State Server , Storing Session State in SQL Server , Using Cookieless Session IDs , Application State

Unit VI **Introduction to web services :** What is a Web Service? Software as a service , Web Service Architectures , SOA , Creating and consuming Web , XML Web Services, Designing XML Web Services , Creating an XML Web Service with Visual Studio, Creating Web Service Consumers ,Discovering Web Services Using UDDI

Unit VI I **Advance .NET Concepts :** Introducing WPF , WPF Class Hierarchy , Introducing WCF The WCF Architecture , WCF Endpoints , Introducing WF , Describing Components of WF , Exploring Activities , Describing Types of Workflows , Exploring Built-in Activities , Understanding Bookmark Activities , Handling Runtime Errors ,Hosting Workflows ,Creating a Simple WF Application

Exploring Silverlight , Architecture of Silverlight , Silverlight Controls in Silverlight Applications, Creating a Simple Silverlight Application Integrating Silverlight with ASP.NET Applications

Introducing AJAX Controls The ScriptManager Control , The ScriptManagerProxy Control , The Timer Control , The UpdatePanel Control , The UpdateProgress Control

Wireless & Mobile Technology

Unit I **Introduction To Wireless Technology :** Mobile and wireless communications , Applications, history, market vision, overview Frequency of Radio Transmission, Signal Antennas, Signal Propagation , Multiplexing, Modulation, Spread Spectrum , Coding and Error Control (Convolution Codes)

Unit II **Wireless Communication** : Cellular systems- Frequency Management and Channel Assignment, Dropped call rates & their evaluation,CDMA – FDMA – TDMA – CSDMA , Generations of Cellular Networks 1G,2G,2.5G,3G and 4G

Unit III **Wireless Lan :** IEEE 802.11,WiFi, IEEE 802.16 ,Bluetooth, WIMAX , Standards – Architecture – Services

Unit IV **Mobile Communication Systems :** GSM-architecture-Location tracking and call setup- Mobility management- Handover-Security-GSM SMS , International roaming for GSM- call recording functions-subscriber and service data mgt - Mobile Number portability - VoIP service for Mobile Networks , GPRS – Architecture-GPRS procedures-attach and detach procedures-PDP context procedure-combined RA/LA update procedures-Billing

Unit V **Mobile Network Layer :** Mobile IP – Dynamic Host Configuration Protocol, Mobile Ad Hoc Routing Protocols– Multicast routing

Unit VI **Mobile Transport Layer :** TCP over Wireless Networks – Indirect TCP – Snooping TCP –Mobile TCP – Fast Retransmit / Fast Recovery Transmission/Timeout Freezing-Selective Retransmission – Transaction Oriented TCP , TCP over 2.5 / 3G wireless Networks

Unit VII **Application Layer :** WAP Model- Mobile Location based services -WAP Gateway –WAP protocols – WAP user agent profile, Caching model-wireless bearers for WAP - WML – WMLScripts – WTA - iMode- SyncML

Soft Computing

Unit I **Introduction to Soft Computing:** Evolution of Computing - Soft Computing Constituents – From Conventional AI to Computational Intelligence - Machine Learning Basics

Unit II **Artificial Neural Network: Introduction,** Fundamental Conce Network, Biological Neural Network, Brain vs. Computer - C Biological Neuron and Artificial Neuron (Brain vs. Computer), Networks, Basic Models of Artificial Neural Network

Supervised Learning Network- Perceptron Networks, Adap (Adaline), Multiple Adaptive Linear Neurons, Back-Propagat propogation learning methods, effect of learning rule co-efficie algorithm, factors affecting backpropagation training, **As Networks, Unsupervised Learning Networks, Special Network**

Unit III **Introduction to Fuzzy Logic, Classical Sets and Fuzzy Sets,** I Logic, Classical Sets (Crisp Sets),Fuzzy Sets

Unit IV **Classical Relations and Fuzzy Relations:** Introduction, C Relation, Classical Relation, Fuzzy Relations

Unit V **Membership Functions:** Introduction, Features of the Mem Fuzzification, Methods of Membership Value Assignments

Unit VI **Defuzzification:** Introduction, Lambda-Cuts for Fuzzy Sets (Al Cuts for Fuzzy Relations, Defuzzification Methods

Unit VII **Fuzzy Arithmetic and Fuzzy Measures:** Introduction, Fuzzy Analysis of Uncertain Values, Fuzzy Numbers, Fuzzy Orderi Extension Principle, Fuzzy Measures- Belief and Plausibility M

Unit VIII **Fuzzy Rule Base and Approximate Reasoning:** Introduction,Truth Values and Tables in Fuzzy Logic, Fuzzy Propositions, Formation of Rules, Decomposition of Rules (Compound Rules), Aggregation of Fuzzy Rules, Fuzzy Reasoning (Approximate Reasoning)- Categorical Reasoning, Qualitative Reasoning, Syllogistic Reasoning, Dispositional Reasoning, Fuzzy Inference Systems (FIS)- Construction and Working Principle of FIS, Methods of FIS,Overview of Fuzzy Expert System

Unit IX **Fuzzy Decision Making:** Introduction, Individual Decision Making, Multiperson Decision Making, Multiobjective Decision Making, Multiattribute Decision Making, Fuzzy Bayesian Decision Making, **Fuzzy Logic Control Systems-** Introduction, Control System Design, Architecture and Operation of FLC System, FLC System Models, Application of FLC Systems

Unit X **Genetic Algorithm:** Basic concepts, Difference between genetic algorithm and traditional methods, Simple genetic algorithm, Similarity templates, Working principle, Procedures of GA, Genetic operators- reproduction, Mutation, crossover, basic building block hypothesis, the two-armed and k-armed bandit problem, Minimal deceptive problem, Applications

Unit XI **Applications of Soft Computing:** Introduction, A Fusion Approach of Multispectral Images with SAR (Synthetic Aperture Radar) Image for Flood Area- Image Fusion, Neural Network Classification, Methodology and Results, Optimization of Traveling Salesman Problem using Genetic Algorithm Approach- Genetic Algorithms, Schemata, Problem Representation, Reproductive Algorithms, Mutation Methods, Results, Genetic Algorithm-Based Internet Search Technique- Genetic Algorithms and Internet, First Issue: Representation of Genomes, Second Issue: Definition of the Crossover Operator, Third Issue: Selection of the Degree of Crossover, Fourth Issue: Definition of the Mutation Operator, Fifth Issue: Definition of the Fitness Function, Sixth Issue: Generation of the Output Set, Soft Computing Based Hybrid Fuzzy Controllers- Neuro-Fuzzy System, Real-Time Adaptive Control of a Direct Drive Motor, GA-Fuzzy Systems for Control of Flexible Robots, GP-Fuzzy Hierarchical Behavior Control, GP-Fuzzy Approach,Soft Computing Based Rocket Engine Control- Bayesian Belief Networks, Fuzzy Logic Control, Software Engineering in Marshall's Flight Software Group, Experimental Apparatus and Facility Turbine Technologies SR-30 Engine, System Modifications, Fuel-Flow Rate Measurement System, Exit Conditions Monitoring

Distributed computing and Cloud Computing

Unit I **Introduction to Distributed Computing Concepts**

Basic concepts of distributed systems, distributed computing models, software concepts, issues in designing distributed systems, client server model and current case studies of the World Wide Web 1.0 and World Wide Web 2.0.

Unit II **Inter Process Communication**

Fundamental concepts related to inter process communication including message-passing mechanism, a case study on IPC in MACH, concepts of group communication and case study of group communication CBCAST in ISIS, API for Internet Protocol

Unit III **Formal Model Specifications and Remote Communication**

Basic concepts of formal model definitions, Different types of communication systems, algorithms for message passing systems, Basic concept of middleware, Remote Procedural Call (RPC), a case study on Sun RPC, Remote Method Invocation (RMI) along with a case study on Java RMI.

Unit IV **Clock synchronization**

clock synchronization, physical and logical clocks, global state mutual Exclusion algorithms, election algorithms.

Unit V **Distributed System Management**

Resource management, process management, threads, and fault tolerance

Unit VI **Distributed Shared Memory**

Fundamental concepts of DSM, types of DSM, various hardware DSM systems, Consistency models, issues in designing and implementing DSM systems ,

Unit VII **Distributed File System**

Concepts of a Distributed File System (DFS), file models, issues in file system design , naming transparency and semantics of file sharing, techniques of DFS implementation,

Unit VIII **Advances in Distributed Computing (SOA & Cloud Computing)**

Service-Oriented Architecture, Elements of Service-Oriented Architectures, RPC versus Document Orientation, Major Benefits of Service- Oriented Computing, Composing Services, Goals of Composition, Challenges for Composition, Spirit of the Approach

Unit IX **Fundamentals of Cloud computing**

Evolution of Cloud Computing ,cluster computing Grid computing, Grid computing versus Cloud Computing, Key Characteristics of cloud computing

Unit X **Cloud models**

Benefits of Cloud models, Public Cloud, Private Cloud, Hybrid Cloud, Community Cloud, Shared Private Cloud, Dedicated Private Cloud, Dynamic Private Cloud, Savings and cost impact

Web services delivered from cloud, Platform as a service, Software as a service, Infrastructure as a service

Unit XI **Cloud Security Fundamentals**

Privacy and security in cloud, Security architecture , Data security, Identity and access management, security challenges

Unit XII **Implementation of Cloud Technologies**

Introduction to Cloud Technologies, Hypervisor, Web services, AJAX , MASHUP, Hadoop, Map reduce, Virtualization Technologies, Virtual Machine Technology Cloud data centre, Case studies : Google, Microsoft, Amazon

Elective II (SELECT ANY ONE)

Cyber Security

Unit I **Introduction to Cybercrime**

Cybercrime definition and origins of the world, Cybercrime and information security, Classifications of cybercrime,

Unit II **ITA 2000 :** Cybercrime and the Indian ITA 2000, A global Perspective on cybercrimes

Unit III **Cyberoffenses& Cybercrime: Issues and challenges**

How criminal plan the attacks, Social Engg, Cyber stalking, Cybercafe and Cybercrimes, Botnets, Attack vector, Cloud computing,Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication Service Security, Attacks on Mobile/Cell Phones, Mobile Devices:Security Implications for Organizations, Organizational Measures for Handling Mobile, Devices-Related Security Issues, Organizational Security Policies and Measures in Mobile Computing Era, Laptops

Internet Filtering Encryption issues, Internet Gambling, Spam - Unsolicited Junk E-mail, Digital Signatures, Anti-Spam Laws, Anti-Spam Suits, What is Cyber squatting? Ant cyber squatting, Software Piracy, Domain Name Disputes, File Sharing ,

Unit IV **Tools and Methods Used in Cyberline :**

Proxy Servers and Anonymizers, Phishing, Password Cracking, Keyloggers and Spywares, Virus and Worms, Steganography, DoSDDoS Attacks, SQL Injection, Buffer Over Flow, Attacks on Wireless Networks, Phishing, Identity Theft (ID Theft)

Unit V **Cybercrimes and Cybersecurity: The Legal Perspectives**

Why do we need Cyberlaw: The Indian Context, The Indian IT Act, Digital Signature and the Indian IT Act, Amendments to the Indian IT Act, Cybercrime and Punishment, Cyberlaw, Technology and Students: Indian Scenario

Unit VI **Cybersecurity: Organizational Implications**

Cost of Cybercrimes and IPR Issues: Lesson for Organizations, Web Treats for Organizations: The Evils and Perils, Security and Privacy Implications from Cloud Computing, Social Media Marketing: Security Risk and Perils for Organization, Social Computing and the Associated Challenges for Organizations, Protecting People's Privacy in the Organization, Organizational Guidelines for Internet Usage, Safe Computing Guidelines and Computer Usage Policy, Incident Handling: An Essential Component, Intellectual Property in the Cyberspace of Cybersecurity, Importance of Endpoint Security in Organizations

Unit VII **Cyber Acts and related issues**

Children's Online Privacy Protection Act (COPPA), The Children's Internet Protection Act (CIPA Sexual Predator Laws), The Child Online Protection Act (COPA) , The Communications Decency Act (CDA), Electronic Signatures in Global & National Commerce Act (E-Sign),

Multimedia Systems

Unit I **Introduction** to Multimedia: Definition and Scope of Multimedia, its Components & applications, Interactive Multimedia, Multimedia Growth, Multimedia Advantages & disadvantages. Major categories of Multimedia titles. Multimedia Products, Kiosk, Multimedia in Public place, Multimedia on Web,Multimedia in business. Multimedia in mobile phones, iPod, Hypermedia and Hypertext. Hypermedia Applications.

Unit II **Graphics & Text**: Graphics: Bitmap Graphics, Vector Graphics, Image file format, GIF vs. JPEG, Graphics image sources, Graphics on internet. Graphic programs feature. Animation: Principals of animations, Animation types & technique , Applications of Animation , Morphing , Warping,Animation file and formats, Text: Text in multimedia Applications, General guidelines ,Designing and use of text , working with text, Text fonts, Menus and Navigation, Font editing drawing tools.

Unit III **Sound , Audio and Video :** Multimedia system sounds , Sound, Sound file formats, MIDI, MIDI Messages, MIDI Vs Digital Audio, sound on Internet, Adding sound & video to your multimedia project, Analog display standards, Digital display standards, Digital video Basics , Video recording and tap formats , Video on internet, Difference between computer , TV and Video, Optimizing video files for CD-Rom.

Unit IV **Multimedia Authoring Tools**: Making instance multimedia, Types of Authoring tools, Time based authoring tools, card and page based authoring tools, Icon and object based authoring tools, Authoring Vs Presentation, Story boarding, Graphic design principle for PowerPoint, Development process for Multimedia Applications, Contents analysis for different applications.

Unit V **Designing and Producing**: Designing, designing the structure of multimedia, Different types of Multimedia structure. Hot spots, Buttons, User interface analysis & Design: Rules of user interface design, models of user interface design, User interface Analysis & Elements of user interface, User interface design, User interface evaluation & examples. Delivering: Testing, Preparing of delivery.

Unit VI **Planning and costing:** The process of making multimedia & multimedia skills, multimedia skills team, Planning & costing: Project planning, scheduling & costing, Idea analysis, Idea management software, Pre testing, Task planning, Building a Team, Prototype, Multimedia project team roles. Development: Alpha Development, Beta Development.

Unit VII **Coding and Compression**: Introduction to coding and compression techniques, Entropy encoding, run length, Arithmetic encoding, Huffman, LimpelZiv encoding, JPEG compression process, MPEG audio and video compression, Various CD Formats , MPEG Standards.

Information Security and Audit

Unit I **Security Principles and Practices:**

Information System Security Principles, Threats and Attacks, Classification of threats and assessing damages, Protecting Information Systems Security,

Information System Security Engineering Process

Security Policies, standards, Guidelines and Procedures

Unit II **Data and Program Security:**

Data Protection, End Point security, Physical Security, Insider threats and data Protection

Secure programs, Non-malicious program errors, malicious code, Targeted malicious code, Controls against program threats

Unit III **Operating System Security:**

Role of Operating systems in Information systems applications, Operating systems Security, Patched Operating systems, Protected Objects and Methods of Protection, Memory Address Protection, Control of Access to General Objects, File Protection Mechanism

Unit IV **Database Security :**

Database Security Requirements and Challenges, Database Integrity, Data Security Policies, Sensitive data, Interface, Multilevel database

Application Software Controls :Concurrency Control, Cryptograph control, Audit train control.

Unit V **Steganography and Digital Forensics:**

Steganography- Overview and Principles, need of steganography, pros and cons, Steganography vs Cryptography, Types of Steganography

Digital Forensics- Introduction, Forensic life cycle,Water marking.

Unit VI **Laws, & Legal Framework for Information Security:**

Introduction, Information Security and Law, Understanding the Laws of Information Security, Indian IT Act, Laws of IPR, Patent laws, Copyright Law, Case Study

Ethical Issues in Information Security: Introduction, Issues in Network enterprises, Computer Ethics and Security and Privacy Policies, Case study

Unit VII **Software Web Services Security :**

Technologies for web services (XML, SOAP, WSDL & UDDI), Web Services Security – Token types, XML encription, XML segment.

UnitVIII **Secutiry of Wireless Networks:**

An overview of wireless technology, Wired world versus wireless world: putting Wireless Networks in Information Security Context,Attacks on Wireless Networks

Unit IX **Auditing for Security:**

Introduction, Organizations Roles and Responsibilities for Security Audits, Auditors Responsibilities for Security Audits, Types of Security Audits, Technology Based Audits, Phases in Security Audits, Budgeting for Security Audits.

Bioinformatics

Unit I What is Bioinformatics? , Bioinformatics as multidisciplinary domain , Goal and scope of bioinformatics , Future prospectus of bioinformatics , Use of computers to biologists

Unit II Biological research on the web, Public biological databases : Primary sequence database, Protein sequence databases , Secondary databases , Protein pattern databases , Searching biological databases- depositing data into public databasesFinding software , Judging the quality of information

Unit III Introduction to Protein structure , Chemistry of proteins : 1D to 3D , Peptide bond, Amino Acid

Web based protein structure tools : Structure visualization , Cn3D, RasMol

Structure modeling , MolMol , JMol

Structure classification : Types of classification, Databases (SCOP,CATH)

Structure alignment : Comparing two structures (ProFit)

Structure analysis : ProCheck

Unit IV Composition of DNA and RNA , Watson and Crick Solve the Structure of DNA, Importanace and features of DNA sequence analysis , Development of DNA Sequencing Methods, Genefinders and Feature Detection in DNA ,

Unit V Pairwise Sequence Comparison, Pairwise Sequence alignemnt methods : Dot plot , Dynamic programming , Local and Global similarities , Word and K-tuple , BLAST , FASTA, Multiple sequence alignment methods : Progressive , ClustalW , Iterative , DiAlign

Unit VI Phylogenetic Analysis : Phylogenetic Trees Based on Pairwise Distances, Phylogenetic Trees Based on Neighbor Joining, Phylogenetic Trees Based on Maximum Parsimony , Phylogenetic Trees Based on Maximum Likelihood Estimation Introduction to motif

Unit VII Automating data analysis using Perl , Perl basics , Pattern matching and regular expressions , Parsing BLAST output using Perl

Software Quality Assurance

Unit I **Fundamentals Of Software Quality Engineering**

Concepts of Quality-Hierarchical Modeling- Quality Models- Quality Criteria And its Interrelation –Fundamentals of Software Quality Improvement-Concepts of Process Maturity- Improving Process Maturity

Unit II **Development In Measuring Quality**

Selecting Quality Goals And Measures-Principles Of Measurement-Measures And Metrics-Quality Functional Deployment-Goal/Question/Measures Paradigm- Quality Characteristics Tree-The FURPS Model And FURPS-Gilb Approach- Quality Prompts

Unit III **Quality Management System**

Element Of A Quality Engineering Program- Quality Control , Assurance And Engineering- Reliability, Maintainability, Verifiability, Testability, Safety And Supportability- Historical Perspective Element Of QMS-Human Factors-Time Management-QMS For Software- Quality Assurance-ISO9000 Series- A Generic Quality Management standard-Tools For Quality

Unit IV **Principles And Practices In Qms**

Process-Product-Project-People In Software Development And Management Spectrum-Principle And Critical Practices In QMS-ISO 9001And Capability Maturity Models-Six Sigma, Zero Defects And Statistical Quality Control.

Unit V **Measures And Metrics In Process And Project Domain**

Key Measures For Software Engineers-Defects- Productivity And Quality-Measuring And Improving The Development Process- Assigning Measures To Process Elements And Events- Isikawa Diagrams- Metrics For Software Quality – Integrating Metric Within Software Engineering Process-Metrics For Small Organization