SARDAR PATEL UNIVERSITY, BALAGHAT

School of Engineering and Technology

Syllabus

Course: Diploma **Semester: VI**

Branch: Computer Science and Engineering **w.e.f. Academic Session: 2024-25**

DCSE601 Computer Graphics, Multimedia and Animation

Course Objectives:

1. Introduce students to the basic principles of computer graphics, including the representation and manipulation of 2D and 3D graphics.
2. Teach students to implement graphics algorithms and techniques using programming languages and graphics libraries.
3. Provide an understanding of the principles of animation and how to create animated graphics.

Unit I: Introduction to Computer Graphics:

Definition of Computer Graphics, Application of Computer Graphics, Display Devices: Raster-Scan, Random-Scan. Graphics Primitives: Points and Lines, Line-drawing Algorithms: DDA, Bresenham's Algorithm. Circle-Drwaing Algorithm: Mid-Point.

Unit II: 2D & 3D Transformation:

Translation, Rotation, Scaling, Shear, Reflection, Clipping: Point Clipping, Line Clipping.

Unit III: Shading and Colour Model:

RGB, CMY, HSV, HLS, CIE Models. Image Manipulation: Illumination Models, Shading Models for Polygons, Gouraud and Phong Shading , Shadows, Transparency, Image Filtering, Image Processing, Geometric Transformation of Images.

Unit IV: Multimedia Technology:

Concepts of Multimedia: Types, Data Streams, Hardware and Software Requirements and Applications, Multimedia Authoring. Digital Audio: Audio Sampling, Recording Digital Audio, Audio Standards for Multimedia Applications. MIDI File Formats, MIDI Hardware and Software. Graphics Image File Formats: Raster Format, Bit map (BMP) Format, Graphics Interchange Format (GIF), Joint Photographic Experts Group (JPEG), Tagged Image File Format (TIFF), Portable Network Graphics (PNG).

Unit V: Computer Animation:

Development of Animations: Non Computer and Computer Based Animations, Different Types of Animations. Flash Basics: Flash Work Flow, Animation Using Flash. The Stage and the Time Line, Symbols and Instances, Symbols and Interactive Movies, Using the Tool Box, Drawing Overview: Flash Drawing and Painting Tools, Working With Color, Using Imported Art Work, Adding Sound, Representation of Animation. Creating Animations: Creating Key Frames, Layers in Animations, Frame Rates, Steps for Creating Animations. Frame by Frame Animations.

Reference Books:

1. Computer Graphics, Multimedia and Animations by Malay K. Pakhira, PHI Learning.

2. Computer Graphics by Donald Hearn and M.Pauline Baker, PHI.
3. Computer Graphics Principles and Practices second edition by James D. Foley, Andeies van Dam, Stevan K. Feiner and Johb F. Hughes, 2000, Addition Wesley.
4. Introduction to Computer Graphics By N. Krishnamurthy T.M.H.

Course Outcome:

At the end of the course, students should be able to:

1. Explain the fundamental concepts and terminology related to computer graphics and multimedia.
2. Implement basic graphics algorithms for rendering and manipulating 2D and 3D objects.
3. Apply different rendering techniques and shading models to enhance visual quality.
4. Integrate various multimedia components (Audio, video, Graphic) into cohesive applications.
5. Design and create animated graphics using principles of animation and key frame techniques.

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DCSE602 Network Security and Management

Course Objectives:

1. Gain foundational knowledge about the principles of network security, including threats, vulnerabilities, and attacks.
2. Understand key concepts such as confidentiality, integrity, availability, authentication, and non-repudiation in the context of network security.
3. Study various encryption algorithms (symmetric and asymmetric), hashing functions, and digital signatures.
4. Evaluate Network Security Policies and Management Practices

Unit I: Overview of Network Security:

Security Overview, Computer Security, Network Security, Key Principles of Network Security-Confidently, Integrity, Availability. Threats to Security, Need of Security, Types of Security, Security Issues.

Unit II: Information System Security Management:

Security Polices, Security Awareness, Security Control: Physical Controls, Procedural Controls, Technical Controls and Legal and Liability. Identification and Authentication: Password, Biometrics, Single Sign On.

Unit III: Secret Communication:

Introduction to Secrete Communication, Basics of Cryptography: Substitution Cipher, Cryptographic Primitives. Encryption, Symmetric Encryption: Stream Cipher, Block Cipher, Sharing Keys. Asymmetric Encryption: Using Certificate Authority, Digital Signature, SSL (Secure Socket Layer), TLS (Transport Secure Layer), Hashing Algorithms.

Unit IV: Network Management:

Definition Need and Advantages. Windows NT Networking Architecture, Windows NT Operating System Design and Basics, Open Systems and Industry Standards. Client/Server Computing, Interoperating with Other Networks, Remote Access Service: Point to point protocol. Network Security and Domain Planning: Security Model Architecture, Controlling Access: User Accounts, User Rights.

Unit V: SNMP for Network Management:

Overview of SNMP, SNMP Registry, Management Information Base, Object Identifiers. SNMP Installation, Starting and Stopping the SNMP Service. Troubleshooting SNMP

Reference Books:

1. Fundamentals of Network Security by John E. Canavan.

2. Network Security Bible by Dr. Eric Cole, Dr. Ronald Krutz, and James W. Conley.
3. Network Management: A Practical Perspective by Allan Leinwand and Karen Fang.
4. Forouzan, TCP/IP Protocol Suite 4th edition, TMH.
5. J.Richard Burkey, Network Management Concept and Practice, PHI.

Course Outcomes:

At the end of the course, students should be able to:

1. Recognize common security threats, such as DoS (Denial of Service), man-in-the-middle attacks, phishing, and malware.
2. Use encryption techniques like RSA, AES, and hashing algorithms like MD5, SHA for securing sensitive information.
3. Configure and manage security devices such as firewalls, routers, and intrusion detection/prevention systems.
4. Assess and manage the risk associated with network security.

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Elective II DCSE6031 Data Mining and Data Warehousing

Course Objectives:

1. To provide a comprehensive understanding of the fundamental concepts, techniques, and processes involved in data mining.
2. To teach methods for data preprocessing, including cleaning, transformation, and reduction to prepare data for analysis.
3. To explore various Data Mining techniques such as classification, clustering, association rule mining, and anomaly detection.

Unit I: Fundamentals of Data Mining:

Data Mining. Data Mining Strategies. Popular Data Mining Techniques. Data Mining Applications. Challenges of Data Mining. The Future of Data Mining.

Unit II: Data Processing and Data Warehousing:

Data, Information and Knowledge. Types of Data. Data Warehouses. Data Cleaning. Data De-normalization. Data Transformation. Data Quality Measure. OLAP, Data Sampling.

Unit III: Association Rule Mining:

Transaction Data. Concepts of Association Rules. Relevance of Association Rule Mining. Functions of Association Rule Mining. The Problem of Large Datasets. Apriority Algorithm. Strengthens and Weakness of Association Rule Mining. Application of Association Rule Mining.

Unit IV: The Clustering Task:

Introduction. Distance Measure. Types of Clustering. Clustering Through Weka: K-Means Algorithms. Clustering Validation. Strengthens and Weakness of Clustering Algorithms. Applications of Clustering Algorithms.

Unit V: The Estimation Task:

Introduction. Scatter Plots and Correlation. Linear Regression Models. Logistic Regression. Regression Analysis. Strengthens and Weakness of Estimation. Applications of Estimation.

Reference Books:

1. Data Mining and Data Warehousing by Bharat Bhushan Agrawal.
2. Arun.K.Pujari, Data Mining Techniques, University Press.
3. N.P Gopalan: Data Mining Technique & Trend, PHI
4. Hand, Mannila & Smith: Principle of Data Mining, PHI
5. Tan, Introduction to Data Mining, Pearson Pub.
6. Berson: Data Warehousing & Data Mining &OLAP , TMH
7. Jiawei Han and Micheline Kamber, Data Mining Concepts & Techniques, Elsevier Pub.

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Course Outcome:

At the end of the course, students should be able to:

1. Describe the key concepts and processes involved in data mining.
2. Implement data preprocessing techniques to prepare datasets for analysis.
3. Utilize various data mining techniques, including classification, clustering, and association rule mining.
4. Identify current trends and future research directions in data mining.

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Elective II DCSE6032 Cloud Computing

Course Objectives:

1. To provide a foundational understanding of Cloud Computing models, architectures, and services
2. To explore various cloud deployment models, including public, private, hybrid, and community clouds.
3. To introduce different types of cloud services, including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS).

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

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Google App Engine, Microsoft Azure , Hadoop , Amazon , Aneka

Reference Books:

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

Course Outcome:

At the end of the course, students should be able to:

1. Describe the key concepts and principles of cloud computing.
2. Identify and differentiate between various cloud deployment and service models.
3. Identify and propose solutions for security challenges in cloud computing.
4. Understand service management and monitoring techniques in cloud environments.