Course	Code	L	T	P	Credits
Wireless & Mobile Communication	**IT 701**	**3**	**1**	**0**	**4**

UNIT I
INTRODUCTION TO WIRELESS NETWORKS:

Introduction-Evolution of mobile radio communications-Differences Between Wireless And Fixed Telephone Networks-Development Of Wireless Networks- Traffic Routing In Wireless Networks- Integrated Services Digital Network (ISDN)- Protocols For Network Access

UNIT II
PRINCIPLES OF CELLULAR WIRELESS NETWORKS:

Introduction- Frequency Reuse- Channel Assignment Strategies-Handoff Strategies-Interference And System Capacity- Trunking And Grade Of Service-Improving Capacity In Cellular Systems.

UNIT III
MULTIPLE ACCESS TECHNIQUES:

Introduction-Multiple Access Techniques: FDMA,TDMA, CDMA- Space Division Multiple Access- Spread Spectrum - Packet Radio

UNIT IV
WIRELESS SYSTEMS AND STANDARDS: Global System for Mobile communication -
CDMA Digital Cellular Standard (IS-95) - CT2 Standard for Cordless Telephones- Digital European Cordless Telephones (DECT). Mobile communication: Mobile data management in 1G,2G,3G, Frequency reuse, sectoring, GSM and CDMA architecture, EDGE technology, Mobile IP, Mobile Agents.

UNIT V
MOBILE AND WIRELESS SECURITY:

Creating Secure Environment- Security Threats-WAP Security: TLS-WTLS-IPSec-Application Level Security- Smart Client: Architecture, Security-Firewalls- VPNs-Two factor Authentication.

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Text Books:
1. Theodore.S.Rappaport, *Wireless Communications-Principles and practice*, Prentice Hall Communications Engineering and Emerging Technologies Series, Upper Saddle River, New Jersey
2. Martyn Mallick, *Mobile and Wireless Design Essentials*, Wiley Dreamtech India pvt ltd.
3. Geoff Varall, Roger Belcher,*3G Handset & Network Design*, Wiley Dreamtech India pvt ltd.

References:
1. Jochen Schiller, *Mobile Communications*, Addision Wesley
2. William C.Y.Lee, *Mobile Communication Design Fundamentals*, John Wiley

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Course	Code	L	T	P	Credits
Wireless & Mobile Communication Lab	**IT 702 P**	**0**	**0**	**2**	**1**

List of experiments:

1. To observe the spectral characteristics of different modulation techniques used in wireless networks e.g. ASK, FSK, PSK.
2. Working of Code Division Multiple Access (CDMA)
3. To design a radio network with a mobile jammer node and two stationary communications nodes.
4. Set up and configuration of wireless access point.
5. To Find the Range of a Wireless Network.
6. Tracking using the GPS device.
7. To implement the code for Wi-Fi Security (Protocol) using C/C++.

Course	Code	L	T	P	Credits
Information Security	**IT 703**	**3**	**0**	**0**	**3**

UNIT I
INTRODUCTION TO INFORMATION SECURITY:

Introduction, the History of Information Security, What Is Security, CNSS Security Model, Components of an Information System, Balancing Information Security and Access, Approaches to Information Security, the Systems Development Life the Security Systems, Development Life Cycle, Security Professionals and the Organization.

UNIT II
THE NEED FOR SECURITY:

Introduction, Business Needs First, Threats, Attacks, And Secure Software Development. Planning for Security: Introduction, Information Security Planning and Governance, Information Security Governance, Information Security Policy, Standards, and Practices, The Information Security Blueprint ,Security Education, Training, and Awareness Program, Continuity Strategies, Model for a Consolidated Contingency Plan, Law Enforcement Involvement.

UNIT III
CONCEPTS OF SECURITY:

Introduction to the Concepts of Security: The need for security, Security Approaches, Principles of Security, Types of Attacks. Cryptographic Techniques: Plain Text and Cipher Text, Substitution Techniques, Transposition Techniques, Encryption and Decryption, Symmetric and Asymmetric Key Cryptography, Steganography, Key Range and Key Size, Possible Types of Attacks.

UNIT IV
CRYPTOGRAPHY:

Computer-based Symmetric Key Cryptographic Algorithms: Algorithm Types and Modes, An overview of Symmetric Key Cryptography, DES, International Data Encryption Algorithm (IDEA), RC5, Blowfish, AES, Differential and Linear Cryptanalysis.

UNIT V
KEY INFRASTRUCTURE:

Key Infrastructure: Digital Certificates, Private Key Management, The PKIX Model, Public Key Cryptography Standards, XML, PKI and Security. Internet Security Protocols: Basic Concepts, Secure Socket Layer, SHTTP, Time Stamping Protocol, Secure Electronic

Transaction, SSL versus SET, 3-D Secure Protocol, Electronic Money, E-mail Security, Wireless Application Protocol (WAP) Security, Security in GSM.

Text Books:

1. Michael E. Whitman, Herbert J. Mattord, "Principles of information security",Course Technology, Cengage Learning.
2. Cryptography and Network Security by Forouzan, The McGraw Hill Companies.
3. William Stallings, "Cryptography and Network Security – Principles and Practices".

Reference Books:

1. Michael E. Whitman, Herbert J. Mattord, "Hands-On Information Security Lab Manual" Course Technology,   Cengage Learning.

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Course	Code	L	T	P	Credits
Information Security Lab	**IT 704 P**	**0**	**0**	**2**	**1**

List Of Experiments:

1. Deploying virtual machines testbed over virtualization software such as: VMPlayer or VirtualBox
2. Creating test machines including Kali/Backtrack and vulnerable machine.
3. Configure and demonstrate use of Traffic monitoringtool such as: Wireshark and tcpdump
4. Configure and demonstrate use of basic Enumeration tools such as: Ping,traceroute, nslookup,dig, nmap
5. Configure and demonstrate use of fingerprinting tools such as: Nmap(Zenmap) ,hping3,DMitry.
6. Configure and demonstrate use of vulnerability assessment tool such as: Nessus, openVAS.
7. Configure and demonstrate use exploit tool such as: metasploit framework.
8. Demonstrate use of a password cracking tool using brute force attack, dictionary attack rainbow tables.
9. Configure and demonstrate use of computer forensics tool.
10. Configuring and deploying Firewall.
11. Configure and demonstrate use of IDS tool such as snort.
12. Configuring and deploying IDPS.

Course	Code	L	T	P	Credits
Image Processing	IT 705	3	0	0	3

UNIT I
INTRODUCTION:
What is digital image processing? The origins of digital image processing, Fundamental steps in digital image processing, components of an image processing system.

UNIT II
DIGITAL IMAGE FUNDAMENTALS:
 Image sensing and acquisition, Image sampling and quantisation, basic relationships between pixels, linear and non-linear operations.

UNIT III
IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN:
Gray level transformations, histogram processing, enhancement using arithmetic/logic operations, spatial filtering, smoothing and sharpening.

Image enhancement in Frequency Domain: Fourier transform and frequency domain, smoothing and sharpening frequency domain filters

Image Restoration: A Model of the Image Degradation/Restoration Process. Inverse Filtering, Minimum Mean Square Error (Wiener) Filtering. Constrained Least Squares Filtering, Geometric Mean Filter, Geometric Transformations.

UNIT IV
COLOUR IMAGE PROCESSING:
Fundamentals, models, colour transformations, smoothing and sharpening, colour segmentation and noise.

Image Segmentation: Detection of discontinuities, edge linking and boundary detection, thresholding, region based segmentation, morphological watersheds.

Representation and description: Representation, boundary descriptors, regional descriptors, relational descriptors.

UNIT V
Image Compression, Morphological Image Processing, Representation and Description.

Text Books:

1. Rafael C Gonzalez, Richard E Woods, Digital Image Processing - Pearson Education
2. Rafael C Gonzalez, Richard E Woods, Digital Image Processing with MATLAB- Pearson Education.

Reference Books:

1. William K Pratt, Digital Image Processing, John Willey
2. A.K. Jain, PHI, Fundamentals of Digital Image Processing, pearson Education.
3. Chanda & Majumdar, "Digital Image Processing and Analysis" , PHI.
4. Mark Nelson, Jean-Loup Gailly "The Data compression Book", bpb Publications.

Course	Code	L	T	P	Credits
Image Processing Lab IT 706 P		**0**	**0**	**2**	**1**

List Of Experiments:

1. Display an image and its histogram.
2. Perform shrinking, zooming and cropping of an image.
3. Perform the experiment for histogram equalization.
4. Perform blurring and de-blurring on an image.
5. Implement the spatial image enhancement functions on a bitmap image – Mirroring (Inversion).
6. Implement the spatial image enhancement functions on a bitmap image – Rotation (Clockwise).
7. Implement the spatial image enhancement functions on a bitmap image – Enlargement (Double Size).
8. Implement (a) Low Pass Filter (b) High Pass Filter.
9. Implement (a) Arithmetic Mean Filter (b) Geometric Mean Filter.
10. Removal of salt and pepper noise.
11. Implement Smoothing and Sharpening of an eight bit color image.
12. Implement (a) Boundary Extraction Algorithm (b) Graham's Scan Algorithm.
13. Implement (a) Edge Detection (b) Line Detection.

Course	Code	L	T	P	Credits
Cloud Computing	**IT 707**	**3**	**1**	**0**	**4**

UNIT I
INTRODUCTION TO CLOUD COMPUTING:
 Definition, Characteristics, Components, Cloud provider, SAAS, PAAS, IAAS and Others, Virtualization concepts; Types of Virtualization & its benefits, Introduction to Various Virtualization OS(Vmware , KVM etc), HA/DR using Virtualization, Moving VMs ,SAN backend concepts,Cloud Fundamentals; Cloud Building Blocks, Understanding Public & Private cloud environments.
Cloud Technologies, Study of Hypervisors.

UNIT II
WEB SERVICES, AJAX AND MASHUPS:
Web services: SOAP and REST, SOAP versus REST, AJAX: asynchronous 'rich' interfaces, Mashups: user interface services.
Virtualization Technology: Virtual machine technology, virtualization applications in enterprises, Pitfalls of virtualization.

UNIT III
MULTITENANT SOFTWARE:
Multi-entity support, Multi-schema approach, Multi-tenance using cloud data stores, Data access control for enterprise applications.Data in the cloud Relational databases,
Cloud file systems: GFS and HDFS, BigTable, HBase and Dynamo. Map-Reduce and extensions: Parallel computing, The map-Reduce model, Parallel efficiency of Map-Reduce, Relational operations using Map-Reduce, Enterprise batch processing using Map-Reduce.

UNIT IV
CLOUD COMPUTING SECURITY CHALLENGES:
Issues in cloud computing, Implementing real time application over cloud platform Issues in Intercloud environments, QOS Issues in Cloud, Dependability, data migration, streaming in Cloud. Quality of Service (QoS) monitoring in a Cloud computing environment .Vulnerability assessment tool for cloud, Privacy and Security in cloud Virtualization security management-virtual threats, VM Security Recommendations, VM-Specific Security techniques, Secure Execution Environments and Communications in cloud.

UNIT V
SETTING UP CLOUD:
How to build private cloud using open source tools, Understanding various cloud plugins, Setting up your own cloud environment; Auto provisioning, Custom images, Integrating tools like Nagios ,Integration of Public and Private cloud.

Text Book:
1. Cloud Computing for Dummies by Judith Hurwitz, R.Bloor, M.Kanfman, F.Halper (Wiley India Edition)
2. Enterprise Cloud Computing by Gautam Shroff,Cambridge
3. Cloud Security by Ronald Krutz and Russell Dean Vines, Wiley-India

Reference Book:
1. Google Apps by Scott Granneman,Pearson
2. Cloud Security & Privacy by Tim Malhar, S.Kumaraswammy, S.Latif (SPD,O'REILLY)
3. Cloud Computing : A Practical Approach, Antohy T Velte, et.al McGraw Hill,
4. Cloud Computing Bible by Barrie Sosinsky, Wiley India