

WIRELESS COMMUNICATION

Paper Code: ETEC-405

Paper: Wireless Communication

L	T/P	C
3	0	3

INSTRUCTIONS TO PAPER SETTER:

MAXIMUM MARKS: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question. No. 1 rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

Objective: The objective of the course is to introduce various wireless networks, mobile networks and their basic architecture starting from 2G through to 3G and 4G.

UNIT – I

Introduction To Wireless Communication Systems: Evolution of mobile radio communications; examples of wireless comm. systems; paging systems; Cordless telephone systems; overview of generations of cellular systems, comparison of various wireless systems.

Introduction to Personal Communication Services (PCS): PCS architecture, Mobility management, Networks signaling. A basic cellular system, multiple access techniques: FDMA, TDMA, CDMA.

Introduction to Wireless Channels and Diversity: Fast Fading Wireless Channel Modeling, Rayleigh/Ricean Fading Channels, BER Performance in Fading Channels, Introduction to Diversity modeling for Wireless Communications

[T1,T2][No. of Hrs. 11]

UNIT - II

2G Networks: Second generation, digital, wireless systems: GSM, IS_136 (D-AMPS), IS-95 CDMA. Global system for Mobile Communication (GSM) system overview: GSM Architecture, Mobility Management, Network signaling, mobile management, voice signal processing and coding. **Spread Spectrum Systems-** Cellular code Division Access Systems-Principle, Power Control, effects of multipath propagation on code division multiple access.

[T1,T2][No. of Hrs. 11]

UNIT - III

2.5G Mobile Data Networks: Introduction to Mobile Data Networks, General Packet Radio Services (GPRS): GPRS architecture, GPRS Network nodes, EDGE, Wireless LANs, (IEEE 802.11), Mobile IP.

Third Generation (3G) Mobile Services: Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G, Introduction to 4G.

[T1,T2][No. of Hrs. 11]

UNIT – IV

Wireless Local Loop (WLL): Introduction to WLL architecture, WLL technologies. Wireless personal area networks (WPAN): Blue tooth, IEEE 802.15, architecture, protocol stack. Wi-Max, introduction to Mobile Adhoc Networks.

Global Mobile Satellite Systems, Case studies of IRIDIUM and GLOBALSTAR systems.

[T1,T2][No. of Hrs. 11]

Text Books:

- [T1] Raj Pandya, "Mobile & Personnel communication Systems and Services", Prentice Hall India, 2001.
- [T2] Theodore S. Rappaport, "Wireless Communication- Principles and practices," 2nd Ed., Pearson Education Pvt. Ltd, 5th Edition, 2008.

Reference Books:

- [R1] T.L.Singhal "Wireless Communication", Tata McGraw Hill Publication.
- [R2] Jochen Schiller, "Mobile communications," Pearson Education Pvt. Ltd., 2002.
- [R3] Yi –Bing Lin & Imrich Chlamatac, "Wireless and Mobile Networks Architecture," John Wiley & Sons, 2001.
- [R4] Lee, W.C.Y., "Mobile Cellular Telecommunication", 2nd Edition, McGraw Hill, 1998.
- [R5] Smith & Collins, "3G Wireless Networks," TMH, 2007
- [R6] Schiller, Jochen, "Mobile Communications", 2nd Edition, Addison Wesley

ADVANCED COMPUTER NETWORKS

Paper Code: ETIT-401

Paper: Advanced Computer Networks

L	T/P	C
3	1	4

INSTRUCTIONS TO PAPER SETTERS:

MAXIMUM MARKS: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from question no. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks

Objective: To understand different network protocols with emphasis on TCP/IP protocol suite.

UNIT-I

Network Layer:

ARP, RARP, ICMP, IPv4 Routing Principles, Routing and overview, DVR and LSR, the IGRP and EIGRP, BGP, Routing Information Protocol (RIP), OSPF (IPv4 / IPv6).

Multicasting in IP Environments-Broadcasting, Multicasting, IGMP and Multicast Listener Discovery (MLD). The Distance Vector Multicast Routing Protocol (DVMRP), Multicast OSPF (MOSPF), Protocol Independent Multicast (PIM).

[T1][No. of Hours 10]

UNIT-II

Transport Layer: Transport layer overview, UDP, TCP (Flow Control, Error Control, and Connection Establishment), TCP Protocol: TCP Tahoe, TCP Reno.

[R1, R3][No. of Hours 10]

UNIT-III

Optical Networking:

Introduction to Optical networking, its benefits and drawbacks, SONET layered architecture, frame format, SONET network configuration, its advantages and benefits. **Quality of Service:** Introducing QoS, Queue Analysis, QoS Mechanisms, Queue Management algorithms, Resource Reservation, Diffserv and Intserv.

[T2] [No. of Hours 10]

UNIT-IV

Overview of latest concepts:

TCP/IP Applications: VoIP, NFS, Telnet, FTP, SMTP, SNMP, Finger, Whois and WWW, IP v6 and Next Generation Networks, xAAS(PAAS, SAAS, HAAS) and Cloud Computing, Big data, Elements of Social Network.

[R2][No. of Hours 12]

Text Books:

[T1] Douglas E. Comer, "Internet networking with TCP/IP", Pearson. TCP/IP, Vol. 2

[T2] B. A. Forouzan, "TCP/IP Protocol Suite", TMH, 2nd Ed., 2004.

Reference Books:

[R1] TCP/IP Illustrated, Volume 1 (The Protocols) by W. Richard Stevens, Pearson Education.

[R2] U. Black, "Computer Networks-Protocols, Standards and Interfaces", PHI, 1996.

[R3] W. Stallings, "Computer Communication Networks", PHI, 1999.

CRYPTOGRAPHY & NETWORK SECURITY

Paper Code: ETIT-403

Paper: Cryptography & Network Security

L	T/P	C
3	0	3

INSTRUCTIONS TO PAPER SETTERS:

MAXIMUM MARKS: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

Objectives: Syllabus should be proposed so as to be covered in 42 to 45 lectures (assuming 14 or 15 weeks session). Syllabus should be evenly divided into 4 Units only.

UNIT- I:

Basic Cryptographic Techniques, Computational Complexity, Finite Fields, Number Theory, DES and AES, Public Key Cryptosystems, Traffic Confidentiality, Cryptanalysis, Intractable (Hard) Problems, Hash Functions, OSI Security Architecture Privacy of Data.

[T1, T2][No. of Hrs: 11]

UNIT- II:

Linear Cryptanalysis, Differential Cryptanalysis, DES, Triple DES, Message Authentication and Digital Signatures, Attacks on Protocols, Elliptic Curve Architecture and Cryptography, Public Key Cryptography and RSA, Evaluation criteria for AES, Key Management, Authentication requirements Digital forensics including digital evidence handling: Media forensics, Cyber forensics, Software forensics, Mobile forensics.

[T1, T2][No. of Hrs: 11]

UNIT- III:

Buffer Flow attack, Distributed Denial of service attack, Weak authentication, Design of Substitution Boxes (S-Boxes), Hash Functions, Security of Hash Functions, Secure Hash Algorithm, Authentication applications, Kerberos, IP security, Pretty Good Privacy (PGP), Web Security Light weight cryptography for mobile devices, Side channel attacks.

[T1, T2][No. of Hrs: 11]

UNIT- IV:

System security, Security Standards, Intruders, and Viruses, Firewalls, Malicious software, Intrusion Detection System, Intrusion Prevention System, Trusted Systems, Virus Counter measures, Authentication Strategies.

[T1, T2][No. of Hrs: 11]

Text Book:

- [T1] William Stallings, "Cryptography And Network Security - Principles and Practices", Prentice Hall of India, Third Edition, 2003.
- [T2] Wade Trappe, Lawrence C Washington, "Introduction to Cryptography with coding theory", 2nd ed, Pearson, 2007.

Reference Book:

- [R1] R.Rajaram, "Network Security and Cryptography" SciTech Publication, First Edition, 2013.
- [R2] Atul Kahate, "Cryptography and Network Security", Tata McGraw-Hill, 2003
- [R3] Bruce Schneier, "Applied Cryptography", John Wiley & Sons Inc, 2001.
- [R4] <http://www.iiitd.edu.in/~gauravg/>

CLOUD COMPUTING

Paper Code: ETIT-407
Paper: Cloud Computing

L	T/P	C
3	0	3

INSTRUCTIONS TO PAPER SETTERS:

MAXIMUM MARKS: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks

Objective: To enable students to understand the basic concepts of Cloud Computing and to apply these concepts for designing, evaluating, simulations and comparing various applications in Cloud Computing.

UNIT I

Introduction to Cloud Computing

Overview of Parallel Computing, Grid Computing, Distributed Computing and its Variants (eg. MANETs, Peer to Peer, Cloud), Introduction to Autonomic Computing, Evolution of Cloud Computing and its vision, Issues and Challenges in Cloud Computing, Applications of Cloud Computing.

[T1, T2][No. of Hours: 10]

UNIT II

Cloud Computing Architecture

Cloud Computing Architectures: features of Clouds: components, types, technologies, Service Models (Services: IaaS, PaaS, SaaS), Deployment Models (Public Cloud, Private Cloud, Hybrid Cloud, Community Cloud) various cloud management platforms and tools.

[T1, T2][No. of Hours: 12]

UNIT III

Virtualization of Clouds

Virtualization: Introduction, Evolution, Virtualized Environment characteristics, Server Virtualization, VM Provisioning and Manageability, VM Migration Services, VM Provisioning in the Cloud Context, and Future Research Directions. Cloud Security Mechanisms (Encryption, PKI, SSO, IAM), Service Management in Cloud Computing (SLA, Billing & Accounting etc).

[T1, T2][No. of Hours: 12]

UNIT IV

Advanced Cloud Applications

Specialized Cloud Architecture: Direct I/O Access, Load Balanced Virtual Switches, Multipath Resource Access, Federated Clouds, Basics of Cloud Mobility, Enterprise cloud computing: Data, Processes, Components, Architectures, applications, Enterprise Software (ERP, SCM, CRM)

Case Studies on Open Source and Commercial available tools and platforms (Microsoft Azure, Google AppEngine, Amazon Web services, Hadoop, Eucalyptus, Cloud SIM etc).

[T1, T2][No. of Hours: 11]

Text Books:

- [T1] Rajkumar Buyya, Christian Vecchiola, and Thamarai Selvi, Mastering Cloud Computing, Tata McGraw Hill, New Delhi, India, 2013.
- [T2] Thomas Erl, Zaigam Mahmood, Ricardo Puttini, Cloud Computing Concepts, Technology & Architecture, 1st Reprint, Pearson India, 2013 (T2)
- [T3] Kumar Saurabh, Cloud Computing, 2nd Edition, Wiley, 2013 (T3)
- [T4] Gautam Shroff, "Enterprise Cloud Computing", Cambridge University Press.

Reference Books:

- [R1] Barrie Sosinsky, Cloud Computing Bible, Wiley
- [R2] A. Srinivasan and J. Suresh, Cloud computing a practical approach for learning and Implementation, Pearson India 1st edition
- [R3] Michael Miller, Cloud Computing, Pearson, 2008.
- [R4] Mukesh Singhal, Niranjana G. Shivaratri, TMH Edition. (Must be included for the basics of distributed systems basics from which all distributed systems have been originated).

.NET AND C# PROGRAMMING

Paper Code: ETIT-419
Paper: .NET and C# Programming

L	T/P	C
3	0	3

INSTRUCTIONS TO PAPER SETTERS:

MAXIMUM MARKS: 75

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be of 12.5 marks.

Objective: This course provides a solid foundation in the C# programming language, and covering the fundamental skills that are required to design and develop object-oriented applications for the web and Microsoft Windows by using Microsoft Visual C# .NET and the Microsoft Visual Studio .NET development environment.

UNIT I

MS.NET Framework Introduction: Framework Components, Framework Versions, Types of Applications which can be developed, Base Class Library, Namespaces, MSIL / Metadata and PE files, The Common Language Runtime (CLR), Managed Code, MS.NET Memory Management / Garbage Collection, Common Type System (CTS), Common Language Specification (CLS), Types of JIT Compilers, Security Manager, control application development

Language basics: Why Datatypes, Global, Stack and Heap Memory, Reference Type and Value Type, Datatypes & Variables Declaration, Implicit and Explicit Casting, Checked and Unchecked Blocks – Overflow Checks, Casting between other datatypes, Boxing and Unboxing, Enum and Constant, Operators, Control Statements, Working with Arrays and methods.

[T1, T2] [No. of Hours: 11]

UNIT II

Introduction to Object Oriented Features: What is an Object, state of an Object, Lifecycle of an Object, relationship between Class and Object, define Application using Objects, Principles of Object Orientation, Encapsulation, Inheritance, Polymorphism, Encapsulation is binding of State and Behaviour together, Inheritance is based on “is a” relationship, Understanding Polymorphism with Examples.

Constructor & Destructor, Working with "static" Members, Constructor in Inheritance, Type Casting of Reference Types, Static and Dynamic Binding and Virtual Methods, Abstract Class Object as Parent of all classes, Interface, Syntax for Implementation of Interface, Explicit Implementation of Interface members, Types of Inheritance, exceptional handling.

[T1, T2] [No. of Hours: 10]

UNIT III

Working with Collections and Generics: IList and IDictionary, typesafety issue with ArrayList and Hashtable classes, IEnumerable and IEnumerator, Sorting Items in the collection using IComparable, custom generic classes, Generic Collection Classes.

Operator Overloading, Partial Classes, Importance of Attributes, working with components/assemblies, data stream and files: text stream, binary stream, working with file system, Serialization & Deserialization, multithreading.

[T1, T2] [No. of Hours: 11]

UNIT IV

WinForms: Introduction, Controls, Menus and Context Menus, Menu Strip, Toolbar Strip, Graphics and GDI, SDI and MDI Applications, Dialog box, Form Inheritance, Developing Custom, Composite and Extended Controls, Data Access using ADO.NET, Data Access using ADO.NET- dataset, XML, debugging and tracing, Delegates & Events: Delegate Declaration, Sample Application, Chat Application using Delegates, += and -= Operator (Events), Chat Application using Delegates and Events, General Syntax for Delegates and Events.

[T1, T2] [No. of Hours: 12]

Text Books:

- [T1] Stephen Walther, "ASP.NET 3.5 Unleashed or ASP.NET 4.5 Unleashed," Pearsons Publication,
- [T2] George Shepherd, "Microsoft ASP.NET 3.5 Step by Step", PHI learning Publication Eastern Economy
- [T3] Chris Love, Marco Bellinaso, "ASP.NET 3.5 Website Programming Problem - Design – Solution," Wrox publication 2012