



C.U.SHAH UNIVERSITY – WADHWANCITY

FACULTY OF: - Technology & Engineering

DEPARTMENT OF: - Electronics & Communication Engineering

SEMESTER: - III **CODE:** - 5TE03VOI1

NAME – Voice Over Internet Protocol (VOI)

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Schemes (Hours)				Credits	Evaluation Schemes							
		Th	Tu	Pr	To		Theory				Practical (Marks)		Total	
							Sessional Exam		University Exam		Internal			University
							Marks	Hours	Marks	Hours	Pr	TW		Pr
5TE03VOI1	Voice Over Internet Protocol (VOI)	04	00	02	06	05	30	1.5	70	3.0	---	20	30	150

Objectives:-

- Voices over Internet Protocol (VoIP) systems are more modern alternatives to traditional telephone systems. VoIP systems transmit voice data over a broadband Internet connection, as opposed to an Analog telephone line. This subject deals with basic concepts of Voice, telephony, and basic concepts of VoIP

Prerequisites: -Basic concepts of probability, random variable and mathematics are essential.

Course Outlines:-

Sr. No.	Course Contents
1	INTRODUCTION: Internet Telephony versus Telephony over the Internet, The Value of VoIP: Return on Investment (ROI), Getting the Most from VoIP: Cost Savings, Capital and Expense Savings, Productivity Savings, New Features, Convergence of Technologies, Potential Drawbacks in VoIP Implementations, VoIP Implementation Realities of ROI, What about VoIP Security?.
2	Digital Voice Fundamentals: Speech Properties, Classes of Speech, Voiced Sounds, Unvoiced Sounds, Plosive Sounds, Sampling, Quantization, Uniform or Linear Quantizers, Nonuniform (Logarithmic) Quantization, Companding, Vector Quantization, Waveform Coding, Time Domain Coding: Pulse Code Modulation, PCM Standardization, Time Domain Coding: Differential PCM (DPCM), Time Domain Coding: Adaptive Differential, PCM (G.721/G.726), Continuously Variable Slope Delta (CVSD) Modulation, Frequency Domain Coding, Vocoding, Hybrid Coding, The GSM Codec, Digital Speech Interpolation.
3	Telephony: Introduction to Telephony, Call Technology Basics, Traditional Handsets, Switch Hook, Side Tone, Dialer, VoIP and VoIP Phones, Understanding Signaling, Subscriber Loop Signaling, Supervisory Signaling, Address Signaling, Call-Progress Signaling, Components of the Phone System, Phone, PBX, Subscriber Loop, Trunk and Access Lines, Making the Basic Telephone Connection, On-hook, Off-hook, Dialing, Switching, Ringing, Talking, North American Numbering Plan (NANP), International Numbering Plan (ITU-T E.164), CCS, CCIS, CAS, and SS7.



C.U.SHAH UNIVERSITY – WADHWANCITY

4	Packet Technologies: Packet Networking Overview, Routing and Switching, IP Networks, VoIP Security Protocols, Confidentiality of Media Data in SIP, Voice Transport Protocols, Signaling Protocols, DNS and DNSSEC with VoIP, MPLS and VoIP, Distribution Protocol (CR-LDP), Voice over Frame Relay Access Devices (VFRADs), Voice over ATM (VoATM)
5	VoIP Processing: Voice Packetization, Compression, VoIP Packet Processing Issues, Packet Timing Jitter, Packet Timing Latency, VoIP Call Setup Protocols, Call Setup Protocols from the Telephony Community, Call Setup Protocols from the Data-Networking Community, Voice Streaming Protocols, IP Telephony Servers, PBXs, and Gatekeepers, VoIP Gateways, Routers, and Switches, IP Phones and Softphones, VoIP and Converged Network Regulatory Issues, The VoIP Regulatory Freedom Act of 2004.
6	VoIP Implementation Basics: Stages of VoIP Implementation, Achieving VoIP Quality and Reliability, The Need for Quality of Service (QoS), Link-layer QoS techniques, Queuing Techniques, IP QoS Techniques, QoS Issues, QoS in a Voice Over Packet System, Tuning for VoIP QoS, Configuration and Testing, VoIP Management, Service Level Agreements (SLAs), Implementing VoIP SLAs, Other VoIP Implementation Issues

Learning Outcomes:-

On the completion of the course, the students will be able to:

- Learn basic concepts and parameters of Voice.
- Learn basic concepts and parameters of Telephony.
- Learn basic concepts and parameters of Packet Technology.
- Learn basic concepts and parameters of VoIP.
- Understand VoIP Implementation.

Books Recommended:-

1. **VoIP Security**, James F. Ransome, CISM, CISSP, John W. Rittinghouse, Ph.D., CISM
2. **Switching to VoIP**, By Ted Wallingford, O'Reilly.
3. **Securing VoIP Networks**, By Peter Thermos, Ari Takanen, **Pearson Education**.
4. **VoIP For Dummies**, By Timothy V. Kelly, **Willy Publication**.
5. **VoIP Handbook: Applications, Technologies, Reliability, and Security**, edited by Syed A. Ahson, Mohammad Ilyas, CRC press.
6. **Carrier Grade Voice Over IP**, COLLINS, Tata Mcgraw Hill



C.U.SHAH UNIVERSITY – WADHWANCITY

FACULTY OF: - Technology & Engineering

DEPARTMENT OF: - Electronics & Communication Engineering

SEMESTER: - III **CODE:** - 5TE03WSC1

NAME – Wireless Security (WSC)

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Schemes (Hours)				Credits	Evaluation Schemes							
		Th	Tu	Pr	To		Theory				Practical (Marks)		Total	
							Sessional Exam		University Exam		Internal			University
											Pr	TW		Pr
5TE03WSC1	Wireless Security (WSC)	04	00	02	06	05	30	1.5	70	3.0	---	20	30	150

Objectives:-

- This course focuses on the advance wireless systems and their security aspects. The students will learn the various designing aspects of security of wireless network. They also learn different tools which can be used for wireless security assessment and evaluation.

Prerequisites: -Basic concepts of wireless concepts and moderate knowledge of wireless systems.

Course Outlines:-

Sr. No.	Course Contents
1	Wireless Network Overview: RF Overview, Wireless Signal Propagation (Reflection, Refraction Diffraction, Scattering Absorption), Signal-to-Noise Ratio, Modulation, Amplitude Modulation, Frequency Modulation, Phase Modulation, Complementary Code Keying (CCK), Quadrature Amplitude Modulation (QAM).
2	Wireless Physical Layer Technologies: ISM Spectrum, Frequency Hopping Spread Spectrum (FHSS), Direct Sequence Spread Spectrum (DSSS), Orthogonal Frequency Division Multiplexing (OFDM).
3	Wireless Local and Personal Area Networks: Ad Hoc Mode, Infrastructure Mode, Bridging, Repeater, Mesh Wireless Networks, Local Area Networking Standards, IEEE 802.11, Real-World Wireless Data Rates, Personal Area Network (PAN) 802.15, Bluetooth 802.15.1, Infrared (IR), Ultra wide Band 802.15.3, ZIGBEE 802.15.4.
4	Wide Area Wireless Technologies: Cell Phone Technologies, Analog, TDMA, CDMA, CDMA2000, GSM, GPS, 802.16 Air Interface Standards, 802.20 Standards.
5	The Wireless Deployment Process: Gather Requirements, Estimation. Make the Business Case, Site Survey.
6	Wireless Tools: Scanning Tools: Network Stumbler, MiniStumbler, Wellenreiter, Wavemon, Sniffing Tools: AiroPeek, Sniffer Pro, Mognet, Hybrid Tools: Kismet, AirTraf, AirMagnet,



C.U.SHAH UNIVERSITY – WADHWANCITY

Denial-of-Service Tools: WLAN-Jack, FATA-Jack, Cracking Tools: WEPCrack, AirSnort, Access Point Attacking Tools, Other Wireless Security Tools.

Learning Outcomes:-

- On the completion of the course, the students will be able to:
- Identify threats to wireless security and detect intrusion.
- Identify methods of securing wireless network access
- Learn various tools of wireless security.

Books Recommended:-

1. **Wireless Security Models, Threat And Solution**, Randall K.Nichols,Panos C. Lekkas, Tata McGraw HILL Edition,2006
2. **Wireless Security Handbook**, Aaron E.Earle , Aurebeach Publication,2006
3. **Wireless Security and Privacy : Best Practice And Design Technique**, Tara M, Swaminatha, Charles R. Elden, Pearson Edition,2003