SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: TCOM 450 Department: Telecommunications Tech.

Course Title: Voice over Internet Protocol (VoIP) Semester: Spring Year: 2010

Objectives/Competencies

Course Objective	Competencies
1. Introduction to Voice over Internet Protocol (VoIP).	1. Explain why telephony over a network is necessary and why VoIP makes sense. 2. Understand the theoretical concepts and practical implications of Voice over IP. 3. Describe the basic characteristics of a VoIP packet and the problems encountered implementing this service. 4. Observe the differences between voice, video and data transfer over a network and why real-time transport is so important to voice traffic. 5. Explain the bandwidth, packet size and any other requirements for VoIP.
2. The practical technology of Voice over IP.	1. Explain how VoIP is installed, who installs it, and where it is currently available. 2. Understand current VoIP standards. 3. Explain the purpose of Voice coders and describe how they work. 4. Understand the role of Digital Signal Processing (DSP)

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	in VoIP. 5. Understand soft switches, Session Initiation Protocol (SIP) servers, call mangers, media servers and unified messaging. 6. Explain current VoIP standards of video transport and how they are implemented
3. VoIP system analysis and networking protocol considerations in the physical layer and above.	1. Understand Quality of Service and other voice quality measurements. 2. Understand Codecs, network delay, and jitter. 3. Perform analysis of typical VoIP products and networks and determine system effectiveness, Quality of Service, and other common analysis parameters. 4. Understand basic VoIP protocol suite transport model. 5. Explain VoIP involvement with OSI Model layers. 6. Understand the tolerance for delay, errors, and variable bit rates over VoIP. 7. Understand basic compression and encryption techniques, and transport technologies used for VoIP. 8. Understand configuration and topology implementations available.
4. Applications of Voice over IP.	1. Explain private and public VoIP services available. 2. Determine the hardware and soft-switch vendors and the service providers in your area. 3. Explain the role of the Virtual Private Networks (VPN) in VoIP implementation.

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	4. Understand combinations and hybrid VoIP implementations. 5. Describe the application of VoIP in terms of entertainment, interactive video, video conferencing and other potential home and business uses.
5. Advanced topics and future applications in VoIP networking and communications.	1. Explain where and how security is maintained in common VoIP implementations. 2. Describe current and developing technologies for combining (multiplexing/demultiplexing) voice, video and data on a single physical channel (convergence) and how the video channel is distinguished. 3. Understand the significance and implementation of Fiber To The Home (FTTH), and the implications to both home and business users. 4. List the major players in the future of VoIP. 5. Perform regular research on the latest advances in VoIP technologies. 6. Predict the device(s) and technologies used in future VoIP implementations, given the nature of emerging technologies.
6. Laboratory VoIP skills and measurement techniques.	1. Be proficient in using and understanding tools, laboratory apparatus, and instrumentation associated with VoIP network testing and simulation implementations. 2. Implements simple VoIP network setups in the

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	laboratory, using standard VoIP components. 3. Perform standard tests on VoIP systems in the laboratory. 4. Become familiar with common VoIP networking components and their operation, and understand device technical data. 5. Use VoIP software (Google Talk, Skype, and PalTalk). 6. Understand and practice standard safety procedures for video communications technologies