# Useful Knowledge in Voice over Internet Protocol: Technology and Regulation (1 day 6 Hours CLE )

## Section 1
## Basic Technology Review (8:30 a.m. to 12:00 p.m.)

a. Circuit Switched Network Elements
   - Loops, Lines, and Trunks
   - Time Division Multiplexing
   - Circuit Switching
   - Signaling (SS7) and Addressing (NPA)

b. Multiplexing Technologies
   - Time Division Multiplexing for Voice
   - Statistical Multiplexing for Data
   - Converting analog to digital
   - Converting digitized voice to Internet Protocol

Break (10:30 a.m. to 11:00 a.m.)

c. Internet Protocol and Architecture
   - IP Addressing
   - Routing
   - Signaling

d. Technical Challenges to Convergence
   - Transmission characteristics of voice
   - Transmission characteristics of data
   - Delay and Jitter in Packet Networks
   - Quality of Service Schemes
     1. ATM Classes of Service
     2. Differentiated Services for IP
     3. Integrated Services for IP
     4. Multi-Protocol Label Switching

## Section 2
## Implementation Alternatives for VoIP (1:00 p.m. to 2:30 p.m.)

a. Enterprise Implementations
   - Private Corporate Networks
     1. Gateways
     2. IP from the desktop
     3. Carrier Provided IP Centrex
     4. Session Initiation Protocol (SIP) Applications

b. Carrier Implementations
   - Backbone Transit
   - Integrated Access for Business
   - Single Line Residential Access

c. Interworking VoIP and the PSTN
   - Call Control
   - Key Protocols for Interworking

Break (2:30 p.m. to 3:00 p.m.)

## Section 3
## Regulatory Issues with VoIP (3:00 p.m. to 4:30 p.m.)

a. Charting the Regulatory History of VoIP
b. Current Regulatory Status of VoIP
   - VoIP vs. PSTN Carriage
     1. Number Assignment
     2. Universal Service Fund Participation
     3. Uninterruptible Power
   - International Regulation
   - World Trade Organization Recommendations
d. Evident Trends in VoIP Regulation
   - Technology vs. Function