IMS has become the convergence platform for offering multimedia services in wireless networks. IMS is the All-IP session control layer for LTE networks. IMS provides an open environment for wireless networks to introduce innovative third party services. As the world moves to an All-IP based architecture, IMS is the de facto platform for providing Voice over LTE (VoLTE) services.

This course is designed to provide you with an end-to-end view of IMS based VoLTE, its architecture, its technologies and services. In particular, the course covers the following important topics (not exhaustive):

- IMS Architecture and major components such as CSCFs, HSS, MGCF, MGC, SDP, AS and others
- IMS implementation for LTE networks
- Implementation of voice, SMS and other services in IMS based VoLTE
- Key IMS features such as QoS, Security
- Interworking between IMS and legacy 1x networks using SR-VCC
- Wireless and Wireline convergence based on IMS/TISPAN architecture

At the end of the course, students will be able to define IMS architecture for LTE, its functions, services and its role in convergence.

### Intended Audience

This course is suitable for the following audience:

- R&D groups, test groups, Product managers and network architects interested in understanding IMS features and functions.
- Sales and Marketing groups interested in understanding IMS services and deployment models
- Technology and deployment groups in operators interested in understanding how to deploy and maintain IMS network.

### Course Outline

1. **Wireless Networks Evolution**
   - Evolution of Radio and Core Networks
   - Rationale for IMS networks
   - Key IMS features
   - IMS Releases (3GPP Release 5, 6 and 7)
2. **LTE Networks**
   - E-UTRAN
   - EPC
3. **IMS Architecture in LTE**
   - End to End view of IMS
   - Session Control Components (CSCFs)
   - Databases (HSS, SLF etc)
   - Legacy Interworking (MGCF, MGC, SGW etc)
   - Policy Management (Policy Servers)
   - IPv6 and IPv4
4. **Voice in LTE using IMS**
   - VoLTE Architecture
   - VoLTE features
   - Roaming architecture for VoLTE
5. **Understanding SIP and Megaco**
   - Basic SIP architecture
   - SIP Call flows
   - Role of Megaco
6. **IMS Voice Setup in LTE**
   - Overall IMS Operations
   - Establishing IP Bearer
   - Registration
   - Origination (home and roaming) scenarios
   - Termination (home and roaming) scenarios
7. **Other Services with IMS**
   - SMS over IMS
   - E-911 in IMS
   - Regulatory services in IMS
8. **Legacy Networks Interworking**
   - Interworking with PSTN
   - Role of MGCF, MGC and SGW
   - Protocols (Megaco, ISUP)
9. **Interworking with 1x CDMA Networks**
   - Convergence with Wireless LAN (Release 6)
   - Role of TISPAN
   - Voice Call Continuity
   - Single Radio Voice Call Continuity
10. **IMS QoS and Security**
    - End to End QoS in IMS
    - QoS Flows (RSVP and DiffServ)
    - Handling QoS for third party services
    - IMS security threats
    - IMS security model
11. **Convergence & Interworking**
    - Convergence with Wireless LAN (Release 6)
    - Role of TISPAN
    - Voice Call Continuity
    - Single Radio Voice Call Continuity
12. **IMS Service Architecture**
    - IMS Service Control Layer
    - Handling Non-SIP applications
    - Application Servers & Service Delivery Platforms
    - Third party services (OSA, PARLAY, Web Services)
    - IMS Service Control (ISC) layer
13. **IPv6 and IMS**
    - IPv6 basics
    - Use of IPv6 in IMS
14. **IMS Deployment & Evolution**
    - Deployment Status
    - IMS Evolution (R7 and beyond)