Aims and Objectives

This module will provide the learner with an introduction to the software frameworks, architectures and tools used to model, design, implement and deploy managed communications services. It will focus on approaches that are being deployed in current fixed and mobile Next Generation Networks to deliver rich communication services, including: IP Multimedia Subsystem (IMS), SIP Servlets, Web Services, and Service Oriented Architecture (SOA) based SDPs and related Application Programming Interfaces (APIs).

Learning Outcomes

On successful completion of this module, students should be able to:

1. Understand and describe the principles underlying the delivery of Next Generation Network communications services, including the current state of international standards governing NGN evolution;
2. Describe the operation of key NGN protocols SIP and Diameter and be experienced in their deployment and use;
3. Design, implement and deploy basic IMS applications, enablers and servlets using the Open IMS framework;
4. Compare and contrast Telco Service Delivery Platforms and APIs and have experience of the use of the Parlay X API;

Discuss the evolution of mobile Next Generation Networks, in particular EPC and IMS above EPC/LTE.

Indicative Syllabus

- Next Generation Network (NGN)
- Session Initiation Protocol (SIP)
- Diameter
- IP Multimedia Subsystem (IMS)
- Service Delivery Platform (SDP)
- SIP/IMS Applications / SIP Servlets
- Application Programming Interface (API)
- Web Services / Parlay X
- Evolved Packet Core (EPC)

Assessment Methodology

- Fulfillment of laboratory exercises on days 1-4 (60%)
- Class written test on the last day afternoon on lectures from day 1 – 5 (40%)

Essential and Supplementary Reading/Resources

Essential Texts:

- The slides provided for this course
- Diameter - http://www.openimscore.org/project/jdp (Java)
- IMS - http://www.openimscore.org/ for CSCFs (C) and HSS (Java)
Recommended Texts:

- AS - http://www.cipango.org/ HTTP/SIP Servlets, Diameter for IMS (Java)
- SIP Tutorial on iptel.org, Jiri Kuthan, Dorgham Sisalem - http://www.iptel.org/tutorial
- 3GPP TS 23.228 IP Multimedia Subsystem (IMS); Stage 2 - http://www.3gpp.org/ftp/Specs/html-info/23228.htm
- 3GPP TS 24.229 IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 - http://www.3gpp.org/ftp/Specs/html-info/24229.htm
- 3GPP TS 24.228 Signalling flows for the IP multimedia call control based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (Rel.5 only) - http://www.3gpp.org/ftp/Specs/html-info/24228.htm
- Open Mobile Alliance (OMA). Instant Messaging using SIMPLE Architecture Candidate Version 1.0 – 03 Sep 2008

- 3GPP TS 24.229 IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Application usage of SIP
- ETSI. ETSI ES 282 002: Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); PSTN/ISDN Emulation Sub-system (PES); Functional architecture. 2009.
- ETSI. ETSI TS 182 028: Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IPTV Architecture; Dedicated subsystem for IPTV functions. 2009
- 3GPP TS 22.173 IMS MMTel Services and supplementary services
- Java Community Process. JSR 281: IMS Services API
- Understanding SIP Servlets 1.1 (Artech House Telecommunications), Chris Boulton, Kristoffer
25 hours preparatory reading (specifically the essential texts listed above).

Also look at:

- www.icin.biz for conference proceedings
- Informa IMS World Forum and SDP Summit series
- www.open-ims.org
20 hours lectures, 20 hours laboratory sessions, and 10 hours nighttime reading/revision within a single week.
25 hours follow-up reading and revision.