Operator Networks Infrastructure

1. **Course number and name:** 020ROPES5 Operator Networks Infrastructure

2. **Credits and contact hours:** 4 ECTS credits, 2x1:15 contact hours

3. **Name(s) of instructor(s) or course coordinator(s):** Alain Bassil

4. **Instructional materials:** Course handouts, lab experiments

5. **Specific course information**
   a. **Catalog description:**
   Overview on operator networks architecture - Study of the operator networks architecture in Lebanon: access network, aggregation network, and backbone network - xDSL physical layer - xDSL devices (DSLAM, BRAS) - xDSL network layer (ATM transport, authentication) - Telephone access architecture - Evolutions in the public operator network in Lebanon – Concepts of virtual circuit switching - Evolution towards MPLS architecture - MPLS VPN services - Deployment of ADSL network platforms - Deployment of MPLS network platforms.

   b. **Prerequisites:** 020INRES1 Introduction to Data Networks

   c. **Selected Elective** for CCE students

6. **Educational objectives for the course**
   a. **Specific outcomes of instruction:**
      - Identify architecture elements of an operator network.
      - Analyze the challenges of deploying an operator network in Lebanon.
      - Describe the delivery of telephony and xDSL services over an operator network.
      - Recognize the evolutions of the public operator network in Lebanon.
      - Analyze the technological evolution towards MPLS.
      - Compare the techniques of implementing VPN services.
      - Configure MPLS devices and troubleshoot associated mechanisms.

   b. **PI addressed by the course:**

PI	1.3	6.2	6.3
Covered	x	x	x
Assessed	x	x	x

7. **Brief list of topics to be covered**
   - Overview on operator networks architecture: physical architecture and services (3 lectures)
   - Study of the operator networks architecture in Lebanon (3 lectures)
   - Telephone service on operators network (2 lectures)

- xDSL service on operators network: xDSL physical layer, xDSL devices, and xDSL network layer (ATM transport, authentication) (4 lectures)
- Deployment of ADSL network platforms (2 lectures)
- Fixed-mobile convergence (2 lectures)
- IP-Multimedia Subsystem (IMS) (1 lecture)
- Migration towards full-IP (1 lecture)
- Evolution towards MPLS architecture (4 lectures)
- MPLS VPN Services (2 lectures)
- Deployment of MPLS network platforms (4 lectures)