Network Engineering

1. **Course number and name:** 020IDRES5 Network Engineering

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

3. **Instructor's or course coordinator's name:** Melhem El Helou

4. **Text book:**
   a. **Other supplemental materials:**
      Course handouts; standards and white papers; research publications; lab experiments

5. **Specific course information**
   a. **Catalog description:**
      This course covers the fundamental principles of network engineering; 2G, 3G, and 4G radio network planning; deployment considerations for mobile networks; quality of service and mobile network optimization; use of professional network planning and evaluation tools; optical network protection and survivability; WDM network design; network virtualization.

   b. **Prerequisites:**

   c. **Required:** Elective for CCE students; required for CCE telecommunication networks option students

6. **Specific goals for the course**
   a. **Specific outcomes of instruction:**
      Perform radio network planning for 2G, 3G, and 4G networks.
      Analyze, evaluate, and improve the quality of service of mobile networks.
      Use professional tools to plan and evaluate mobile networks.
      Evaluate and optimize optical network protection and survivability.
      Design WDM networks.
      Analyze network virtualization.

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

KPI	b1	b2	b3	c1	c2	c3	e2	e3	k2	k3
Covered	x	x	x	x	x	x	x	x		x
Assessed	x	x	x	x	x		x	x	x	x
Give Feedback										

7. **Topics and approximate lecture hours:**
   Principles of network engineering (2 lectures)
   Radio network planning for 2G, 3G, and 4G networks (7 lectures)

Deployment considerations for mobile networks (1 lecture)
Quality of service and mobile network optimization (5 lectures)
Optical network protection and survivability (4 lectures)
WDM network design: LTD and RWA problems (6 lectures)
Network virtualization: SDN and NFV technologies (3 lectures)