Quality of Service in Networks

1. **Course number and name:** 020QOSES5/020QSNES5 Quality of Service in Networks

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

3. **Name of course coordinator:** Juliana El Rayess

4. **Instructional materials:** Lecture slides, Course handouts and tutorials, lab experiments

5. **Specific course information**
   a. **Catalog description:**
   Traffic control in networks – Congestion control – Traffic shaping – Traffic policing – Traffic engineering – Quality of experience – Performance metrics in networks: delay, jitter, and loss probability – IP traffic models and properties – Architectures for quality of service – DiffServ model – Multimedia transport – IP multicast – Quality of service deployment in local networks – Quality of service deployment in wireless local networks – Quality of service deployment in the Internet – Internet regulation – Network neutrality – Passive and active measurements in networks – Collaborative measurement of quality of service.

   b. **Prerequisites:** 020INRES1/020IDNES1 Introduction to Data Networks

   c. **Required** for CCE Telecommunication Networks Option students; **Selected Elective** for students in the CCE Artificial Intelligence and Software Engineering Options.

6. **Educational objectives for the course**
   a. **Specific outcomes of instruction:**
   - Analyze the traffic characteristics in networks and identify the performance criteria.
   - Compare the network architectures for quality of service and identify the traffic control mechanisms.
   - Analyze the deployment of quality of service in wired and wireless local networks.
   - Design and deploy a network architecture and protocols for quality of service.
   - Analyze the challenges of deploying quality of service on the Internet and explain the concept of network neutrality.

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

PI	1.1	1.2	1.3	6.1	6.2	6.3	6.4	2.1	2.2	2.3	2.4	2.5	7.1
Covered		x	x	x	x								x
Assessed	x	x	x	x	x	x	x	x	x	x	x	x	x

7. **Brief list of topics to be covered**
   - Fairness and rate sharing in networks (2 lectures)
   - Traffic control mechanisms in networks (4 lectures)
   - Group activity on the TCP protocol (2 lectures)
   - DiffServ and IntServ architectures (3 lectures)
   - Quality of service vs quality of experience (1 lecture)
   - Activity on analyzing traffic properties in access and backbone networks (2 lectures)
   - Traffic models (2 lectures)
   - Multimedia transport protocols (2 lectures)
   - Quality of service mechanisms in wireless local networks (1 lecture)
   - End-to-end quality of service (1 lecture)
   - Quality of service monitoring (2 lectures)
   - Group activity on deploying quality of service (2 lectures)