

## **Advanced Networking and WAN Technologies**

- 1. Course number and name:** 020RLIES4 Advanced Networking and WAN Technologies
- 2. Credits and contact hours:** 4 ECTS credits, 2x1:15 contact hours + 2:30 lab hours
- 3. Name(s) of instructor(s) or course coordinator(S):** Joseph Fares
- 4. Instructional materials:**
  - a. Other supplemental materials:**

Course material and online access to the detailed course content including course text, related interactive media and simulation activities.
- 5. Specific course information**
  - a. Catalog description:**

This course covers the third and fourth semester of the Cisco CCNA Routing & Switching curriculum. It focuses on the architecture, components and operation of routers and switches in a larger and more complex network by presenting the configuration of this equipment for advanced functionality. Emphasis is also placed on WAN technologies and network services required by converged applications in a complex network, providing an understanding of network device selection criteria and WAN technologies that meet network requirements.
  - b. Prerequisites:** 020RCOES2 Network Routing and Switching
  - c. Selected Elective** for CCE students
- 6. Educational objectives for the course**
  - a. Specific outcomes of instruction:**
    - Understand and describe the design of local networks.
    - Configure, verify and troubleshoot VLANs spanning multiple switches: VTP, DTP and EtherChannel.
    - Configure, verify and troubleshoot STP protocols: Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Plus Protocol (PVST+) and Rapid Per VLAN Spanning Tree Plus Protocol (RPVST+).
    - Understand, configure and troubleshoot first hop redundancy protocols (HSRP).
    - Understand and describe dynamic routing protocols, distance vector and link-state.
    - Configure, verify and troubleshoot routers in a complex IPv4 and IPv6 network.  
using single area OSPF, multi-area OSPF and Enhanced Interior Gateway Routing Protocol (EIGRP).
    - Understand and describe the different WAN technologies and their advantages.
    - Configure, verify and troubleshoot IPv4 ACLs.

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

<b>PI</b>	2.1	2.2	2.4	2.5	6.2	7.1
<b>Covered</b>	x	x	x	x		
<b>Assessed</b>	x	x	x	x	x	x

**7. Brief list of topics to be covered**

- LAN Design
- Scaling VLANs: VTP, DTP, Layer 3 Switching
- Spanning Tree concepts, variant protocols and configuration
- Etherchannel and HSRP concepts and Implementation
- Dynamic Routing: Distance Vector and Link-State routing protocols
- EIGRP characteristics and implementation for IPv4
- EIGRP Tuning and Troubleshooting
- Single-Area OSPFv2 characteristics and implementation
- Multiarea OSPF Operations and Implementation
- OSPF Tuning and Troubleshooting
- WAN concepts and technologies
- Access Control Lists: Standard IPv4 ACLs review, Extended IPv4 ACLs
- Configuring VTP and DTP
- Configuring HSRP and PagP
- Configuring EIGRP