

410 CNE Course Syllabus

Course Code	410 CNE
Course Name	Internet architecture and programming
Credit Hours	3
Contact Hours	4
Instructor Name	Dr. Sofiene DRIDI

Text Book (title, author, and year)	
<ul style="list-style-type: none"> • Internet routing architectures 2nd edition, s. Halabi, d. Mcpherson, 2000 • CCNP1: advanced routing, 2nd edition, cisco press, 2004 	

Specific Course Information	
Catalog Description	This course discusses the core elements of Internet architecture, VLSMs, private addressing, and NAT to enable more efficient use of IP addresses, implementation of routing protocols such as RIPv2, EIGRP, OSPF and BGP.
Prerequisites	Computer Networks, CNE310.
Co-requisites	NIL
Required/Elective	required

Course Learning Outcomes	
1	To outline the basic mathematical and engineering skills for analysing dynamic routing protocols algorithms (RIP, EIGRP, OSPF, BGP) and define the basic operations of interior and exterior (IGP and EGP) dynamic routing protocols
2	To list the modern dynamic routing protocols used in internet architecture.
3	To describe and analyze ISP (Internet Service Provider) architecture.
4	To explain and conduct experiments for configuring routing protocols for real-world architecture.
5	To outline internet technologies and state their impact on modern societies.
6	To operate simulation tools such as GNS3 in order to perform all required design, configuration and test issues of internet services.
7	To exhibit mature team-work to fulfill the requirements of specific internet projects.
8	To show awareness for the modern internet technologies and develop the mindset for advanced technology monitoring and long life learning and training.

Mapping course LOs to the SLO.

Course LOs #	Student Learning Outcomes											
	a1	a2	b1	b2	b3	b4	b5	c1	c2	c3	d1	d2
1	√											
2		√										
3			√									
4				√								
5						√						
6							√					
7								√				
8										√		

List of Theory Topics

Routing Overview: Routing Fundamentals, Static Routing, Distance Vector Routing Protocols, Link-State Routing Protocols, Routing Information Protocol Version 2.

EIGRP protocols: EIGRP Fundamentals, DUAL Finite-State Machine, EIGRP Components, EIGRP Tables, EIGRP and the bandwidth Command.

OSPF protocols: OSPF Overview, OSPF Terminology, OSPF Operation, OSPF Configuration and Verification, Multi-area OSPF Operation.

BGP protocols: BGP, Autonomous Systems, BGP basic terminology, BGP messages types, BGP operations, internal & external BGP, BGP basic commands.

Advanced BGP configuration: BGP Attributes, BGP Local Preference, Multi-Exit-Discriminator (MED), BGP decision process.

List of Lab Experiments

1. Static routing protocol configuration ,default static routing protocol
2. Study and design wan network using packet tracer
3. Configuring, troubleshooting RIPv2 and EIGRP protocols (GNS3)
4. Configuring, troubleshooting OSPF protocols (GNS3)
5. Configuring basic BGP (external and internal neighboring routers)
6. Advanced BGP design and configuration (peer groups & neighbors, BGP local preference attribute, BGP med)
7. Configuring effective Internet routing policies
8. Socket programming (TCP,UDP programming)