Program : **Diploma in Computer Engineering**	
Course Code : **6137**	Course Title: **Computer Network Engineering Lab**
Semester : **6**	Credits: **2.5**
Course Category: **Program Core**	
Periods per week: **4 (L:0 T:1 P:3)**	Periods per semester: **60**

Course Objectives:

- Provide hands-on experience in computer networking.

Course Prerequisites:

Topic / Description	Course Code	Course Title	Semester
Identification of ports and installation of various interfaces		Computer System hardware lab	3
Basic knowledge in IP addressing, routing and networking devices		Computer Communication and Networks	4

Course Outcomes

On completion of the course, the students will be able to:

COn	Description	Duration (Hours)	Cognitive Level
CO1	Identify and configure hardware components in a network	11	Applying
CO2	Build Local Area Networks.	17	Applying
CO3	Plan and configure Routers.	13	Applying
CO4	Construct Virtual Local Area Network (VLAN)	16	Applying
	Lab Exam	3	

CO-PO Mapping

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3			3			
CO2	3	3		3			
CO3	3		3	3			
CO4	3	3	3	3		3	

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

Module Outcomes	Name of Experiment	Duration (Hours)	Cognitive Level
CO1	**Identify and configure hardware components in a network**		
M1.01	Identify various types of networking cables and connectors	2	Understanding
M1.02	Identify various networking devices such as switch, router, wireless router etc.	2	Understanding
M1.03	Practice Crimping.	4	Applying
M1.04	Experiment with installation and configuration of wired and wireless NIC	3	Applying
CO2	**Build Local Area Networks**		
M2.01	Demonstrate IP address and MAC address of NIC	2	Understanding
M2.02	Demonstrate static and dynamic IP address settings	2	Understanding
M2.03	Experiment peer to peer networking.	3	Applying
M2.04	Implement Local Area Networks	3	Applying
M2.05	Make use of basic network configuration commands like ping, ifconfig,tracert etc	2	Applying
M2.06	Plan and configure a wireless router to access the Internet.	3	Applying
M2.07	Identify simple problems in LAN and troubleshooting of LAN	2	Applying
	Lab Exam – I	1.5	

CO3	**Plan and configure Routers.**		
M3.01	Demonstrate Network Simulator	1	Understanding
M3.02	Experiment with basic router commands	2	Applying
M3.03	Experiment network in a simulator with switches	2	Applying
M3.04	Plan and configure Network in a simulator with two LAN's and a router	4	Applying
M3.05	Plan and configure Network in a simulator with two LAN's and two routers	2	Applying
M3.06	Plan and configure Network in a simulator with three routers	2	Applying
CO4	**Construct Virtual Local Area Network (VLAN)**		
M4.01	Experiment with MAC Address Table verification	1	Applying
M4.02	Demonstrate creating and renaming VLANs in a Switch	1	Applying
M4.03	Experiment assigning VLAN membership to switch ports	2	Applying
M4.04	Experiment verifying VLAN information by show vlan brief command	2	Applying
M4.05	Configure Inter-VLAN routing using L3 Switch/Router	2	Applying
M4.06	Experiment with testing the reachability between the users of VLANs .	2	Applying
	Open Ended Experiments**	6	
	Lab Exam – II	1.5	

****-Suggested Open-ended Experiments:**

(Not for End Semester Examination but compulsory to be included in Continuous Internal Evaluation. Students can do open-ended experiments as a group of 2-3. There is no duplication in experiments between groups.)

1. Setup a LAN for the real world situation.
2. Resolve the problems in a LAN.

Text / Reference:

T/R	Book Title / Author
T1	Vikas Gupta, ***Comdex Hardware and Networking Course Kit***, Dreamtech Press, 2018
T2	Todd Lammle, ***CCNA Routing and Switching Complete Study Guide***, Sybex (Wiley) Publication, 2016, 2nd Edition

Online Resources:

Sl. No.	Website Link
1	https://www.freeccnastudyguide.com/study-guides/icnd1-100-101/
2	https://study-ccna.com/
3	http://www.codesandtutorials.com/hardware/
4	https://www.omnisecu.com/cisco-certified-network-associate-ccna/index.php