Home

Savitribai Phule Pune University, Pune
Second Year Artificial Intelligence & Machine Learning (2020 Course)
218548 : Computer Networks Laboratory

Teaching Scheme:	Credit Scheme:	Examination Scheme:
Practical (PR) : 02 hrs/week	01	PR : 25 Marks TW: 25 Marks

Prerequisite Courses, if any:

Course Objectives:

1. To design and implement small size network and to understand various networking commands.
2. To provide the knowledge of various networking tools and their related concepts.
3. To understand various application layer protocols for its implementation in client/server environment.
4. To understand network layer protocols and its implementations.
5. To explore and understand various simulations tools for network applications.

Course Outcomes:

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

CO1: Implement small size network and its use of various networking commands.
CO2: Understand and apply of networking and simulation tool i.e packet tracer.
CO3: Configure the various routing and switching protocols using packet tracer.
CO4: Configure various client/server environments to use application layer protocols.
CO5: Explore use of protocols in various wired applications.

Guidelines for Instructor's Manual

The faculty member should prepare the laboratory manual for all the experiments and it should be made available to students and laboratory instructor/Assistant.

The instructor's manual should include prologue, university syllabus, conduction & assessment guidelines, topics under consideration-concept, objectives, outcomes, networking diagrams in packet tracer, and rules to implement the protocols.

Guidelines for Student's Lab Journal

1. The laboratory assignments are to be submitted by students in the form of journals. The Journal consists of prologue, Certificate, table of contents, and handwritten write-up of each assignment (Title, Objectives, Problem Statement, Outcomes, software & Hardware requirements, Date of Completion, Assessment grade/marks and assessor's sign, Theory-Concept, algorithms, printouts of the code written using coding standards, sample test cases etc.)
2. Practical Examination will be based on the term work.
3. Candidate is expected to know the theory involved in the experiment.
4. The practical examination should be conducted if the journal of the candidate is completed in all respects and certified by concerned faculty and head of the department.
5. All the assignment mentioned in the syllabus must be conducted.

Guidelines for Lab /TW Assessment

1. Examiners will assess the term work based on performance of students considering the parameters such as timely conduction of practical assignment, methodology adopted for implementation of practical assignment, timely submission of assignment in the form of handwritten write-up along with results of implemented assignment, attendance etc.
2. Examiners will judge the understanding of the practical performed in the examination by asking some questions related to theory & implementation of experiments he/she has carried out.

Guidelines for Laboratory Conduction

The instructor is expected to frame the assignments by understanding the prerequisites, technological aspects, utility and recent trends related to the topic. The instructor may set multiple sets of assignments and distribute among batches of students. It is appreciated if the assignments are based on real world problems/applications.

All the assignments should be conducted on 64-bit open-source software like packet tracer, g++/turbo C++/Eclipse, Seventh assignment is for study only. Configure the application protocols on latest server operating system separately.

Guidelines for Practical Examination

Both internal and external examiners should jointly set problem statements for practical examination. During practical assessment, the expert evaluator should give the maximum weightage to the satisfactory implementation of the problem statement. The supplementary and relevant questions may be asked at the time of evaluation to judge the student's understanding of the fundamentals, effective and efficient implementation. The evaluation should be done by both external and internal examiners.

List of Assignments

1. Network Commands on Linux/Windows - CO1

Explore and Study of TCP/IP utilities and Network Commands on Linux/Windows.

i) Ping
ii) ipconfig / ifconfig
iii) Hostname
iv) Whois
v) Netstat
vi) Route
vii) Tracert/Traceroute/Tracepath
viii) NSlookup
ix) Arp
x) Finger
xi) Port Scan / nmap

2. Configuration of router using router commands and subnetting of network -CO2,CO3,CO5

Using a Network Simulator (e.g. packet tracer) Configure
i) A router using router commands,
ii) Sub-netting of a given network

3.Configuration of Static routing and Default routing - CO2,CO3,CO5
Using a Network Simulator (e.g. packet tracer) Configure i) Static Routing ii) Default Routing
4. Configuration of EIGRP,RIPv2,OSPF - CO2,CO3,CO5
Using a Network Simulator (e.g. packet tracer) Configure i) EIGRP – Explore Neighbor-ship Requirements and Conditions, its K Values Metrics Assignment and Calculation, ii) RIPv2 iii) OSPF – Explore Neighbor-ship Condition and Requirement, Neighbor-ship states, OSPF Metric Cost Calculation.
5. Configuration of NAT,ACL,VLAN,STP - CO2,CO3,CO5
Using a Network Simulator (e.g. packet tracer) Configure i) Network Address Translation: Static, Dynamic & PAT (Port Address Translation) ii) Access Control lists – Standard & Extended. iii) VLAN, Dynamic trunk protocol and spanning tree protocol.
6. Socket Programming - CO4,CO5
Socket Programming using C/C++/Java. i) TCP Client, TCP Server ii) UDP Client, UDP Server
7. Server Administration - CO4,CO5
Introduction to server administration (server administration commands and their applications) and configuration of any three of below Server: (Study/Demonstration Only) FTP, Web Server, DHCP, Telnet, Mail, DNS
Reference Books
1. Andrew S. Tanenbaum, David J. Wethrall, Computer Network, Pearson Education, ISBN: 978-0-13-212695-3. 2. Behrouz A. Forouzan, Data Communication and Networking, McGraw Hill Education, ISBN: 978-1-25-906475-3, 5th Edition. 3. Kurose Ross, Computer Networking: A Top Down Approach Featuring the Internet, Pearson Education, ISBN: 978-81-7758-878-1. 4. Mayank Dave, Computer Network, Cengage Learning, ISBN :978-81-315-0986-9.