LABORATORY HANDOUT

NETWORK SECURITY FOUNDATION LAB (COM-412)

BE-IVTH SEMESTER

ACADEMIC YEAR (2024-25)

Dr. Mir Aadil

Assistant Professor

Department of Computer Science Engineering
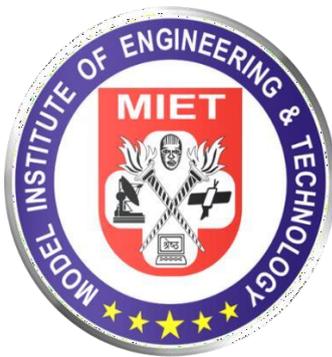
Department of Computer Science Engineering

Model Institute of Engineering & Technology (Autonomous)

Kot Bhalwal, Jammu - 181122

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SYLLABUS

Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
COM-412	Network Security Foundation Lab	PCC	2	0	0	4	50	-	50
Faculty Details	aadil.cse@mietjammu.in								

After completion of this course the student will be able to	
CO1	Identify and describe common enterprise network devices and protocols.
CO2	Configure IP addresses, subnetting, and DHCP on firewalls.
CO3	Analyze and capture network traffic using Wireshark.
CO4	Implement and understand encryption algorithms, key management, and PKI.
CO5	Configure and deploy NGFW features for a zero-trust environment.

List of Activities for Network Security Foundation Lab (CISCO Packet Tracer and NS2)

S. No	Activities
1.	Basic Network Configuration ● Learn to configure basic network settings on Cisco devices
2.	Configuring VLANs ● Implement VLANs to segment network traffic.
3.	Inter-VLAN Routing ● Enable communication between VLANs using a router or Layer 3 switch
4.	Configuring Access Control Lists (ACLs) ● Use ACLs to control network traffic and restrict access
5.	Setting Up a DHCP Server. ● Configure a DHCP server to dynamically assign IP addresses to network devices
6.	Implementing Network Address Translation (NAT). ● Configure NAT to allow internal devices to access external networks.
7.	Installation of NS2. ● Create a basic network with two nodes and simulate data transfer between them.
8.	● Set up and simulate a basic network topology to understand the fundamental components of NS2.
9.	● Simulate common network attacks like DoS (Denial of Service) in NS2.
10.	● Simulate and analyze the performance of network security protocols, such as IPsec.
11.	● Simulate and evaluate the effectiveness of an IDS in detecting network intrusions.
12.	● Configure and evaluate network security with multiple security zones.

*Note: Value Added Course (VAC): The students must complete the Certification for Palo Alto Networks Certified Network Security Engineer.
The PCNSE certification covers how to design, deploy, operate, manage, and troubleshoot Palo Alto Networks Next-Generation Firewalls.

Certification Objectives: Palo Alto Networks technology is highly integrated and automated. The Palo Alto Networks product portfolio comprises multiple separate technologies working in unison to prevent successful cyber-attacks. The Palo Alto Networks Certified Network Security Engineer (PCNSE) demonstrates that engineers can correctly deploy and configure Palo Alto Networks Next-Generation Firewalls while leveraging the rest of the platform.

ADDITIONAL WEB RESOURCES

1.	**NPTEL:** Foundations of Cryptography By Prof. Ashish Choudhury	IIIT Bangalore Foundations of Cryptography - Course
2	**The Palo Alto Networks Certified Network Security Engineer (PCNSE)** **https://www.paloaltonetworks.com/services/education/palo-alto-networks-certified-network-security-engineer**
3.	**Packet Tracer Tutorials** **https://tutorials.ptnetacad.net/**
5	**Getting Started with Cisco Packet Tracer** https://www.netacad.com/courses/getting-started-cisco-packet-tracer?courseLang=en-US
6	**Exploring Networking with Cisco Packet Tracer** **https://www.netacad.com/courses/exploring-networking-cisco-packet-tracer?courseLang=en-US**
7	**NS2 SIMULATOR TUTORIAL FOR BEGINNERS** **https://www.ns2project.com/ns2-simulator-tutorial-for-beginners/**

LAB REPORT INSTRUCTIONS

- Provide specific title of the lab experiment.

- Theory: Provide a concise abstract (typically 100-200 words) that summarizes the purpose, methods, key findings, and significance of the experiment.

- Materials/ Equipment: List all materials, components, and equipment used in the experiment. Include specifications when applicable.

- Software/Simulation Tools:

- Experimental Procedure: Describe the step-by-step procedure for conducting the experiment. Be detailed and clear in your instructions. Include diagrams or schematics to illustrate the setup, connections, and component placement. Explain any variations or adjustments made to the standard procedure.

- Observation & Calculations/Analysis: Detail the data you collected during the experiment. Include descriptions of measurements and any calculations made. Use tables, charts, or graphs to present data clearly. Discuss any trends, patterns, or significant observations. Interpret the data in the context of the experiment's objectives. Ensure that all figures, tables, and equations are correctly labeled.

- Results: Summarize the key findings of the experiment. Present results in a clear and organized manner using tables and graphs. Include units of measurement and labels for data points.

- Conclusion: Provide a concise summary of the experiment's key points and outcomes.

GRADING AND ASSESSMENT
- **Sessional Test**: 20 marks
- **Assignment**: 20 marks
- **Attendance**: 10 marks
- **Final Examination**: 100 marks

COURSE POLICIES
- **Attendance**: Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Academic Integrity**: MIET's academic integrity policies apply. Plagiarism will not be tolerated.
- **Late Submissions**: Assignments and projects must be submitted by the specified timelines.

FACULTY INFORMATION
- **Office Hours**
  Monday (12:05 PM - 12:55 PM)
  Friday (12:05 PM - 12:55 PM)

- **Contact Information**
  aadil.cse@mietjammu.in

RUBRICS FOR LAB CONTINUOUS EVALUATION

Parameters	Performance			Marks
	Low	**Medium**	**High**	**Marks**
Execution of the Experiment	Student was not able to setup and conduct the Experiment completely	Student was able to setup and conduct the experiment but measurement/results/observations were not correct	Students was able to set and conduct the experiment and the measurement/results/observations were not correct	10
	0-2 Marks	3-6 Marks	7-10 Marks	
Record	Student was not able to describe the detailed procedure and could not record the measurement.	Student was able to describe the detailed procedure partially or with some inaccuracy.	Student was able to describe the detailed procedure accurately and record all measurements correctly.	10
	0-2 Marks	3-6 Marks	7-10 Marks	
Viva Voice	Students could not demonstrate sufficient knowledge of foundation, functional or applied aspects related to the experiment during viva.	Students demonstrated sufficient knowledge of foundation, functional or applied aspects related to the experiment during viva.	Students demonstrate strong knowledge of foundation, functional or applied aspects related to the experiment during viva	10
	0-2 Marks	**3-6 Marks**	**7-10 Marks**	
Total Marks				**30**

Save Paper
Save Trees
Save the World