SYLLABUS

CODE	COURSE NAME	CATEGORY	L	T	P	CREDIT	Year of Introduction
CBL 302	INFORMATION SECURITY LAB	PCC	0	0	0	3	2022

Preamble: The course aims to offerstudents a hands-on experience on network related commands and configuration files in Linux operating system. This course also introduces tools for network traffic analysis and network monitoring and also provides hands-on experience in tools used in security.

Prerequisite: C programming, Operating Systems and Computer Networks.

Course Outcomes: After the completion of the course the student will be able to

CO 1	Implement the substitution ciphers. Knowledge Level: Apply
CO 2	Implement/Apply popular cryptographic algorithms DES, AES, RSA, SHA. Knowledge Level: Apply
CO 3	Write basic shell scripts. Knowledge Level: Apply
CO 4	Explore the operating system level security mechanisms in Linux. Knowledge Level: Apply
CO 5	Demonstration of security tools like Intrusion Detection Systems and Network packet capture tools .(Cognitive Knowledge Level: Apply)

Mapping of course outcomes with program outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO 1	☑	☑	☑		☑							☑
CO 2	☑	☑	☑		☑							☑
CO 3	☑	☑	☑		☑							☑
CO 4	☑	☑	☑		☑							☑
CO 5	☑	☑	☑		☑							☑

Assessment Pattern

	Continuous Assessment Test(Internal Exam) Marks in percentage	End Semester Examination Marks in percentage
Remember	20	20
Understand	60	20
Apply	20	60
Analyse		

Evaluate		
Create		

Mark distribution

Total Marks	CIE	ESE	ESE Duration
150	75	75	3 Hrs

Internal Examination Pattern:
The marks will be distributed as
Algorithm 30 marks,
Program 20 marks,
Output 20 marks and
Viva 30 marks.
Total 100 marks, which will be converted out of 15 while calculating Internal Evaluation marks.

End Semester Examination Pattern:
The percentage of marks will be distributed as
Algorithm 30 marks,
Program 20 marks,
Output 20 marks and
Viva 30 marks
Total 100 will be converted to out of 75.
Total: 75 marks.

Operating System to Use in Lab : Linux
Compiler/Software to Use in Lab :gcc
Programming Language to Use in Lab :AnsiC/Python/SAGE

Fair Lab Record:

All Students attending the System and Network Security Lab should have a Fair Record. The fair record should be produced in the University Lab Examination. Every experiment conducted in the lab should be noted in the fair record. For every experiment in the fair record, the right hand page should contain Experiment Heading, Experiment Number, Date of experiment, Aim of the Experiment and the operations performed on them, Details of experiment including algorithm and result of Experiment. The left hand page should contain a print out of the codeusedfor experiment and sample output obtained for a set of input.

Text Books

1. W. Richard Stevens, Bill Fenner, Andy Rudoff, UNIX Network Programming:

Volume 1, The Sockets Networking API, 3rd Edition, Pearson, 2015.

2. William Stallings, Lawrie Brown. “Computer Security: Principles and Practice”, 4th edition

3. William Stallings, Cryptography and Network Security Principles and Practice, 4/e, Pearson Ed.

4. Lisa Bock, Learn Wireshark: Confidently navigate the Wireshark interface and solve real-world networking problems, Packt Publishing, 2019

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Mandatory

1. Perform encryption, decryption using the following techniques .Also implement bruteforce attack.

a) Ceaser cipher

b)Affine Cipher

c) Playfair cipher

d) Hill Cipher

e)Vigenere cipher

2. Implement DES algorithm

3. Apply RSA algorithm for a practical application

4.ImplementDiffie Hellman Key Exchange,

5. Calculate the message digest of a text using the SHA-1 algorithm.

6.Implement simplified AES

7. Implement the SIGNATURE SCHEME - Digital Signature Standard.

8. Experiments on shell scripting

a) Write a shell script to print file names in directory showing date of creation & serial number of file.

b) Write a shell script to check whether a user has logged in, continue checking further after every 30 seconds till success.

c) Write a shell script to deny exec right to another program.

d) Write a shell script to test file integrity. Create hash for files and check changes

9. Experiments on OS security in Linux

a) Manage Users

b) Manage File permissions

10. Experiments on OS security in Linux

a) Process Permissions

b) Access Control Lists

11. Write programs using the following system calls of Linux operating system:

fork, exec, getpid, exit, wait, close, stat, opendir, readdir

12. Write programs using the I/O system calls of Linux operating system (open, read, write)

13. Familiarization with Wireshark.

14. Demonstrate Intrusion Detection System(IDS) using any tool

Practice Questions

1. Write a program to check the complexity of a password.
2. Write a program to implement Primality Testing using Miller-Rabin Method
3. Write a program to implement MD5 hash
4. Write a program to implement privilege escalation and evasion
5. Write a Key logger / key logger detection tool program using python
6. Write a program to implement pseudo random number generation
7. Write a shell script to create a file in $USER/class/batch directory
8. Write a shell script to display the list of files in a directory.
9. Write shell script for showing the count of users logged in.
10. Write a shell script to count lines, words & characters in its input (do not use wc)
11. Write a shell script to print end of a Glossary file in reverse order using array.
12. Write a shell script to check access to root and stop escalation to root from another script.
13. Write a shell script to check access from users other than in white list
14. Write a shell script to check any shell script running.

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