GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Information Technology

Course / Subject Code :ME01000711

Subject Name : Advanced cryptography and network security

WEF Academic Year :	2024-25
Semester :	1st Semester
Category of the Course :	PEC

Prerequisite :	Concept of symmetric and asymmetric Cryptography and Hashing
Rationale :	Cryptography is one of the most important solutions that corporate and governments across the world use today to ensure that systems that hold their important data will be secure. The Medium of exchange is internet which involved networks of system. It is important to protect networks and national critical information systems against unauthorized access.

Course Scheme :

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
				Theory		Practical		
L	T	PR	C	ESE (E)	PA(M)	ESE (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Course Content:

Sr. No.	Course Content	No. of Hours	% of Weightage
1	• Cryptography • Concepts and Requirements of Cryptograpy • Cryptographic systems and technology • Data classification and Regulatory requirements • Public key infrastructure and certification management • Security Protocols	13	30
2	• Networks and Communications	20	30

	• Network Monitoring and Control • Access control protocols and standards • Remote network Access control • Data Plane and Control plane • Network Segmentation • Secure device implementation • Firewall and proxy implementation • Network Routers and Switches • Intrusion detection and Prevention devices		
3	• Systems and Application Security • Understand Malicious code and apply countermeasures • User threats and Endpoint device Security • Secure Software defined Networks and Virtual Environments	5	20
4	• Risk identification, Monitoring and Analysis • Understanding the Risk Management Process • Risk Management Frameworks • Risk analysis and Risk Assessment • Managing Risks • Risk Visibility and Reporting • Analyzing Monitoring results	7	20
	Total	**45**	**100**

Reference Book:

1) Systems Security Certified Practiioner By George Murphy, Sybex publication
2) The complete reference Network security By Robertta Bragg, Mark Rhodes-Ousley,Keith Stassberg, Tata McGrawHill Publishing

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level*
01	Explore different techniques used throughout modern cryptographic systems	UN
02	Investigate various theories and concepts used in modern networks.	AP
03	Effectively perform Risk management	AP

*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create

Suggested Course Practical List:

1. Implement Intrusion detection system – SNORT
2. Take two parties which are exchanging important trade documents. They want to use Public key cryptography. Implement the key exchange mechanism.
3. Take two parties which are exchanging important trade documents. They want to use symmetric key cryptography. Implement the key exchange mechanism.

List of Laboratory/Learning ResourcesRequired:

1) Computers/Laptops with internet connectivity

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