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Diploma Program

Cyber Security

Subject Name: Web Technologies

Total Units: 14

UNIT I

- Unit 1: Introduction to Web Engineering
- Unit 2: Web Applications
- Unit 3: Web Essentials
- Unit 4: Web Servers

UNIT II

- Unit 5: Introduction to Markup Languages
- Unit 6: XHTML Syntax and Semantics
- Unit 7: Fundamental HTML elements

UNIT III

- Unit 8: Introduction to CSS
- Unit 9: Cascading and Inheritance
- Unit 10: CSS Box Model

UNIT IV

- Unit 11: Introduction to JavaScript
- Unit 12: Control Structures
- Unit 13: Scoping Rules
- Unit 14: Objects in JavaScript

Subject Name: Database System

Total Units: 14

UNIT I

- Unit 1: Introduction to database, Applications, History of database system
- Unit 2: File Processing system, Database management system
- Unit 3: Database design and Data models

UNIT II

- Unit 4: Relational Database design and Features of Good relational database
- Unit 5: Atomic Domain and data normalization
- Unit 6: Introduction to database languages
- Unit 7: MySQL data types

UNIT III

- Unit 8: Managing MySQL database
- Unit 9: DML, DCL and TCL
- Unit10: Constraints

UNIT IV

- Unit 11:PHP My Admin, Connecting MySQL database
- Unit 12: Performing basic database operations
- Unit 13: Setting query parameter, Executing query, Joins
- Unit 14: Aggregate functions

Subject Name: Fundamentals of Cryptography

Total Units: 14

UNIT I

- Unit 1: Introduction to Concepts of Security
- Unit 2: Need of Security, Principles of Security
- Unit 3: Types of Attack

- Unit 4: Program Security

UNIT II

- Unit 5: Cryptographic Concepts and Techniques
- Unit 6: Substitution Techniques
- Unit 7: Substitution Techniques – II

UNIT III

- Unit 8: Transposition Techniques
- Unit 9: Symmetric and Asymmetric Cryptography
- Unit10: Diffie Hellman Key Exchange Algorithm & Steganography

UNIT IV

- Unit 11: Symmetric Key Algorithms, Variation in DES
- Unit 12: International data encryption algorithm
- Unit 13: Advanced Encryption Standard (AES) , Asymmetric Key Algorithms
- Unit 14: Digital Signature & Attacks on Digital Signature

Subject Name: Programming in Python

Total Units: 14

UNIT I

- Unit 1: Python Basics Keywords and Identifiers
- Unit 2: Python Variables and Definitions
- Unit 3: Python Data Types
- Unit 4: Python Operators

UNIT II

- Unit 5: Python Control Statements
- Unit 6: Looping Statements - I
- Unit 7: Looping Statements - II

UNIT III

- Unit 8: Python Lists
- Unit 9: Python Tuples
- Unit10: Python Sets
- Unit 11: Python Dictionary

UNIT IV

- Unit 12: Python Functions
- Unit 13: Arrays in Python
- Unit 14: Exception Handling in Python

Semester 2

Subject Name: Introduction to Cyber Security

Total Units: 14

UNIT 1

- Unit 1: Introduction to Cyber Security - Overview of Cyber Security, Internet Governance: Challenges and Constraints, Cyber Threats
- Unit 2: Cyber Warfare, Crime & Terrorism - Cyber Warfare, Cyber Crime, Cyber terrorism
- Unit 3: Cyber Espionage and Policy Imperatives - Cyber Espionage, Need for a Comprehensive Cyber Security Policy, Need for a Nodal Authority

UNIT 2

- Unit 4: Understanding Cybercrime: Origins and Classifications - Origins of Cybercrime, Classifications of Cybercrimes, Cybercrime and Computer Crime, Cybercriminals
- Unit 5: Attack Planning and Legal Frameworks - Criminals Plan for Attacks, Botnets, Attack Vector, The Indian IT ACT 2000 and amendments
- Unit 6: Cyber Intrusion Techniques and Tools - Tools and Methods used in Cybercrime: Introduction, Proxy Server and Anonymizers, Password Cracking

- Unit 7: Malware and Intrusion Tactics - Keyloggers and Spyware, Ransomware, DOS and DDOS attack

UNIT 3

- Unit 8: Phishing Fundamentals and Social Engineering - Introduction to Phishing, Methods of Phishing, Phishing Techniques
- Unit 9: Deceptive Practices and Identity Theft - Phishing Toolkits and Spy Phishing, Identity Theft: PII, Types of Identity Theft
- Unit 10: Identity Theft Strategies and Legal Context - Techniques of ID Theft, The Evolutionary Past - Types of intellectual property rights, Ethical Issues

UNIT 4

- Unit 11: Physical Security Threats Assessment - Physical Security Threats, Physical Security Prevention and Mitigation Measures
- Unit 12: Response and Recovery Strategies - Recovery from Physical Security Breaches, Security Auditing Architecture
- Unit 13: Auditing and Risk Assessment Procedures - Security Audit Trail, Security Risk assessment
- Unit 14: Safeguard Implementation and Compliance - Security Controls or Safeguard, IT Security Plan, Implementation of Controls

Subject: Information Security

Total Units: 14

UNIT 1

- Unit 1: Computer Security Concepts: Threats, Attacks and Assets,Security Functional Requirements
- Unit 2: Security Architecture Computer Security Strategies: Security policy, Implementation, Assurance
- and Evaluation
- Unit 3: Implementation, Assurance and Evaluation

UNIT 2

- Unit 4: Introduction to Database Security: Components of Database,
- Unit 5: Security requirements of Databases, Reliability and Integrity,
- Unit 6: Two phase update, Sensitive Data, Inference,
- Unit 7: Database Encryption, SQL, Injection Attack.

UNIT 3

- Unit 8: Network Security: Introduction to various protocols,
- Unit 9: Threats to Network Communication, Wireless Network Security, DNS Attacks
- Unit10: Network Encryption, Browser Encryption, Onion Routing, IPSec,
- Unit 11: VPN, Firewall Intrusion Detection System- Types, Goals of IDS, IPS

UNIT 4

- Unit 12: Linux Security Model, File System Security, Linux Vulnerability,
- Unit 13: Linux System Hardening, Application Security.Window Security Architecture,
- Unit 14: Windows Vulnerability, Windows Security Defense, Browser Defenses

Subject Name: Internet and Web Application Security

Total Units: 14

UNIT 1

- Unit 1: Introduction to Internet Security Protocols,Types of Web Pages,TCP/IP Protocol and Security,IPv4 and IPv6 Security, HTTPS (HTTP Secure)
- Unit 2: Introduction to Internet Authentication Applications,Kerberos Authentication Protocol,X.509 Certificate Authentication, Public Key Infrastructure (PKI)
- Unit 3: Integrating Security Protocols and Authentication Applications, Advanced Topics in Internet Security, Case Studies and Practical Applications

UNIT 2

- Unit 4: Introduction to Email Security, Interception of Email
- Unit 5: Email Anonymity and Spoofing, Anonymous, Pseudonymous, and Disappearing Email, Spoofing and Spamming
- Unit 6: Advanced Email Security Protocols, Secure Socket Layer (SSL) and Transport Layer Security (TLS),Buffer Overflow Attack on SSL, PGP, and S/MIME

UNIT 3

- Unit 7: Introduction to Web Applications, Web Applications vs Conventional Applications
- Unit 8: Vulnerabilities in Web Applications, Possible Attacks
- Unit 9: Defense Mechanisms, Introduction to defense mechanisms for web application security, Best practices for mitigating vulnerabilities and preventing attacks., Technologies and techniques for protecting against common web application security threats.

UNIT 4

- Unit 10: Definition and purpose of social networks, Evolution and significance of social media in modern society.
- Unit 11: Classification of social media based on communication modes (e.g., social networking, microblogging, photo-sharing).
- Unit 12: Social Media Platforms, Social Media Functions and Usage
- Unit 13: Social Media Privacy, Security Issues and Challenges
- Unit 14: Opportunities in Online Social Networking, Pitfalls and Risks

Subject Name: Ethical Hacking and Digital Forensic

Total Units: 14

UNIT 1

- Unit 1: Introduction to Ethical Hacking: Concept of Ethical Hacking
- Unit 2: Types of Hackers: Hackers: Black Hat and White Hat Hackers, Hacker Mindset etc.
- Unit 3: Hacking, Threats, Network Hacking, Clickjacking
- Unit 4: Password Hacking and Cracking, Password Cracking Counter Measures, Input Validation Attacks

UNIT 2

- Unit 5: Tools For Ethical Hacking, Introduction to APT, Kali
- Unit 6: Phases of Ethical Hacking
- Unit 7: Reconnaissance, Port Scanning, Exploitation, Maintaining Access, Reporting
- Unit 8: Role of Ethical Hacker within Legal Boundaries, Benefits and Limitations of Ethical Hacking, Cyber Cell

UNIT 3

- Unit 9: Forensic Science: Introduction to Forensic Science, Digital Forensics Science
- Unit 10: Cyber Forensics and Digital Evidence: Need for Cyber Forensics and Digital Evidence, Principles of Digital Forensic
- Unit 11: Locard's Exchange Principle, Digital Forensics Process Model, Training & Awareness, Penetration Testing

UNIT 4

- Unit 12: Computer Operating System Artifacts: Finding Deleted Data, Hibernating Files, Examining Window Registry
- Unit 13: Recycle Bin Operation, Understanding of Metadata, Restore points and Shadow Copies
- Unit 14: Legal Aspects of Digital Forensics: Understanding the legal aspects aspects and their impact on digital forensics