B.Sc. Part – II Computer Science (Optional) (Semester – IV)
Course Code: DSC-D11 Computer Science Paper –VII
Course Title: Cyber Security Essentials
Total Contact Hours: 36 Hrs (45 Lectures of 48 Min.)
Teaching Scheme: Theory – 03 Lect. / Week

Credits: 02 **Total Marks: 50**

Course Outcomes:

Upon successful completion of this course, students will be able to

1. understand the concept of information security management.
2. learn different access control methods.
3. understand wireless network security.
4. learn cyber security laws and the importance of security audit.

Unit – 1: Computer Networks and Information Security 12 Hrs.

- **Basic Terminologies:** Network, Internet, Internet Protocols, IP Address, MAC Address, Domain Name Server (DNS), DHCP. Components of computer networks - files server, workstation. Network, devices - hub, repeater, bridge, router, gateway.
- **OSI Model, TCP/IP Model**
- **Information Security:** Network Security, Types of Network Security, Cyber Security, CIA Triad, Common Types of Attacks -Distributed denial of service (DDoS), Man in the middle, Email attacks, Password attacks, Malware attacks. DoS attack, Goals for Security, E-commerce Security, Security protocols, Computer Forensics, Security Management- Overview of Security Management, Information Classification Process, Security Policy, Risk Management, Security Procedures and Guidelines, Business Continuity and Disaster Recovery, Ethics and Best Practices.

Unit – 2: Network Security, Access Controls, Cyber Security and Cyber Laws 24 Hrs.

- **Wireless Network Security:** Components of wireless networks, Security issues in wireless, Firewall, types of firewall.
- **Access Controls:** Overview of Authentication and Authorization, Overview of Intrusion Detection Systems, Intrusion Detection Systems and Intrusion Prevention Systems.
- **Introduction to Cyber Security:** Firewalls, Intrusion Detection Systems, Response, Scanning, Security policy, Threat Management, Cyber Security Vulnerabilities and Cyber Security Safeguards Introduction to Cryptography, Network-based Intrusion detection, Intrusion prevention system, ethical hacking
- **Cyber Security:** Email security: PGP and SMIME, Web Security: web authentication, SSL and SET, Database Security.
- **Cyber Security Laws:** Cyber Crime, Security Assurance, Security Laws, Intellectual Property Rights, International Standards, Security Audit- Need, Importance.

References:

1. Computer Network -AS Tannenbum
2. Cyber Security for Beginners: Everything you need to know about it (Cyber security, Cyber war, Hacking) - Harry Colvin.
3. How NOT To Use Your Smartphone - Rodney D Cambridge.
4. Online Safety: Scams, SPAM, Viruses and Clouds (Cyber Security Community Book - A.M. Perry.

5. Cyber Security Essentials- James Graham, Richard Howard, Ryon Olson (E-book)
6. Network Security Secrets and Solutions – Stuart McClure, Joe Scambray, George Kurtz.
7. Information Assurance Handbook: Effective Computer Security and Risk Management Strategies – Corey Schou, Steven Hernandez.
8. Applied Network Security Monitoring: Collection, Detection, and Analysis – Chris Sanders, Jason Smith.
9. E-Commerce- Indian Perspective- P.T. Joseph S.J.
10. E-Commerce and Security- Kjell Orsborn (E-book)