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Information Security — Complete Syllabus (Program Elective-3, Option 1)

BTEUP Diploma in Computer Science & Engineering • 5th Semester • Session 2026-27
Subject 5.4.1 (Practicum) • Total 100 Marks • 5 Credits • L 3 - P 4 • Choose this OR
Advance Computer Networks

Examination Scheme

Code	Paper	Type	L - P	Credits	Internal	External	Total
5.4	Program Elective-3: Information Security	Practicum	3 - 4	5	40	Theory 60 (3 hrs)	100
Information Security Total				5	40	60	100

What This Subject Aims To Do

To learn how to evaluate and enhance the information security of IT infrastructure and organisations. By the end you should be able to: understand the security needs and issues of IT infrastructure, and apply basic skills in security audit of networks, operating systems and application software.

Unit-Wise Complete Topic List

Unit	Topic	Periods	Marks Share
1	Introduction to Information Security	8	20%
2	Security Weaknesses in Networks	10	22%

3	Cryptography and Secure Development	8	20%
4	Network Security Products	8	20%
5	Security Standards, Audit and Policy	8	18%

Unit 1 — Introduction to Information Security (8 Periods, 20%)

Topics: Introduction to information security; various aspects of information security (PAIN); security features of operating systems — authentication, logs, audit features, file system protection, user privileges, RAID options, anti-virus software, etc.

In simple words: Why security matters, and the protections already built into operating systems — passwords, logs, permissions and anti-virus.

Unit 2 — Security Weaknesses in Networks (10 Periods, 22%)

Topics: Understanding security weaknesses in popular networking protocols — IP, TCP, UDP, RIP, OSPF, HTTP, SMTP, etc.; security weaknesses in common networking devices — hub, switch, router, WiFi; security solutions to mitigate security risk of networking protocols (IPSec, HTTPS, etc.) and devices (VLAN, VPN, ingress filtering, etc.).

In simple words: Where networks are weak — in their protocols and their boxes — and the standard fixes that protect them.

Unit 3 — Cryptography and Secure Development (8 Periods, 20%)

Topics: Basics of cryptography; PKI; security considerations while developing software.

In simple words: Secret writing done properly: encryption, public-key infrastructure (how secure websites prove who they are), and writing software that does not open holes for attackers.

Unit 4 — Network Security Products (8 Periods, 20%)

Topics: Network security products — firewall, IDS/IPS, VPN concentrator, content screening gateways, etc.

In simple words: The security appliances that guard a network: firewalls, intrusion detection/prevention systems, VPN concentrators and content filters.

Unit 5 — Security Standards, Audit and Policy (8 Periods, 18%)

Topics: Introduction to security standards — ISO 27001, Indian IT Act, IPR laws; security audit procedures; developing security policies; disaster recovery; business continuity planning.

In simple words: The rules of the profession: international standards, Indian law, how to audit a system, how to write a security policy, and how an organisation recovers after a disaster.

Practical Work

- Study the security provided within the Windows operating system.
- Recover the password of Windows machines using a password recovery utility (John the Ripper) or any other utility.
- Trace the origin of an email using an email trace tool.
- Use of keylogger and anti-keylogger to secure your system.
- Encrypt and decrypt a message using simple transposition — permutation (CrypTool).
- Encrypt and decrypt a message using Caesar Cipher with variable key (CrypTool); encrypt and decrypt a message using a 3×3 Hill Cipher (CrypTool).
- Create a digital signature document using CrypTool.
- Send and receive a secret message using steganography techniques using Steghide.

Reference Books (as listed in the syllabus)

- Information Security and Cyber Laws — Sarika Gupta, Khanna Publishing House
- RFCs of the protocols listed in the content (ietf.org)
- Various Acts, Laws and Standards (IT Act, ISO 27001 Standard, IPR and Copyright Laws, etc.)
- Security guideline documents of operating systems (OS manuals, man pages, etc.)
- cert-in.org.in
- sans.org

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Source: BTEUP 3rd Year curriculum (folder2627), approved in C.D.C. meeting held on 16.07.2026. Topic lists follow the official syllabus; short explanations are the author's own plain-English summaries, not syllabus text.

Please confirm with your own polytechnic for any local changes.