# B.S.E

# CYBER SECURITY

---

# SYILLABUS

## Year 1

Semester 1

---

Matrices and Calculus
Engineering Chemistry
Programming for Problem Solving
Basic Electrical Engineering
Computer Aided Engineering Graphics
Elements of Computer Science & Engineering
Engineering Chemistry Laboratory
Programming for Problem Solving Laboratory
Basic Electrical Engineering Laboratory

Semester 2

---

Ordinary Differential Equations and Vector Calculus
Applied Physics
Engineering Workshop
English for Skill Enhancement
Electronic Devices and Circuits
Applied Physics Laboratory
Python Programming Laboratory
English Language and Communication Skills Laboratory
IT Workshop

Semester 3

---

Digital Electronics
Data Structures
Computer Oriented Statistical Methods
Computer Organization and Architecture
Object Oriented Programming through Java
Data Structures Lab
Object Oriented Programming through Java Lab
Gender Sensitization Lab
Skill Development Course (Data visualization- R Programming/ Power BI)

## Year 2

Semester 1

---

Digital Electronics
Data Structures
Computer Oriented Statistical Methods
Computer Organization and Architecture
Object Oriented Programming through Java
Data Structures Lab
Object Oriented Programming through Java Lab
Gender Sensitization Lab
Skill Development Course (Data visualization- R Programming/ Power BI)

Semester 2

Discrete Mathematics
Business Economics & Financial Analysis
Operating Systems
Computer Networks
Software Engineering
Operating Systems Lab
Computer Networks Lab
Real-time Research Project/ Field Based Project
Constitution of India
Skill Development Course (Node JS/ React JS/ Django)

Semester 3

Network Security and Cryptography
Database Management Systems
Formal Languages and Automata Theory
Compiler Design
Artificial Intelligence
Data warehousing and Data Mining
Ad-hoc & Sensor Networks
Cloud Computing
Ethical Hacking
Data Science
Distributed Systems
Cyber Laws
IoT Security
Network Security and Cryptography Lab
Database Management Systems Lab
Advanced Communication Skills Lab
Intellectual Property Rights
Skill Development Course (UI design- Flutter)

## Year 3

Semester 1

Cyber Security
Cyber Crime Investigation & Digital Forensics
Algorithm Design and Analysis
Mobile Application Security
Machine Learning
DevOps
Mobile Application Development
Blockchain Technology
Cyber Crime, Cyber Laws & IPRCyber Security Lab
Cyber Crime Investigation & Digital Forensics Lab
Professional Elective – III Lab
Environmental Science
Industrial Oriented Mini Project / Summer Internship/ Skill Development Course (Big data-Spark)

Semester 2

---

Vulnerability Assessment & Penetration Testing
Network Management Systems and Operations
Edge Analytics
Web & Database Security
Computer Security & Audit Assurance
Social Media Security
Deep Learning
Quantum Computing
Data Analytics for Fraud Detection
5G Technologies
Security Incident & Response Management (SOC)
Authentication Techniques
Data Hiding & Data Protection
Tactical Cyber Assessment & Penetration Testing Lab
Network Management Systems and Operations Lab
Project Stage - I
Skill Development Course (Infection Monkey/Conjur)

Semester 3

---

Organizational Behavior
Quantum Cryptography
IoT Cloud Processing and Analytics
Cloud Security
Digital Watermarking and Steganography
Data Privacy
Project Stage – II including Seminar
Evaluate secure software engineering problems, including the specification, design, implementation, and testing of software systems.
Elicit, analyze and specify security requirements through SRS
Design and Plan software solutions to security problems using various paradigms
Model the secure software systems using Unified Modeling Language Sec(UMLSec)
Develop and apply testing strategies for Secure software applications
Design of error correcting codes and decoding algorithms
Design and Analysis of light weight and code-based cryptosystems
Design of network coding algorithms for communication networks
Wireshark:

i. Packet Capture Using Wire shark
ii. Starting Wire shark
iii. Viewing Captured Traffic
iv. Analysis and Statistics & Filters.

Nmap scan
Operating System Detection using Nmap
Do the following using NS2 Simulator:

i. NS2 Simulator-Introduction
ii. Simulate to Find the Number of Packets Dropped
iii. Simulate to Find the Number of Packets Dropped by TCP/UDP
iv. Simulate to Find the Number of Packets Dropped due to Congestion
v. Simulate to Compare Data Rate & Throughput.
vi. Simulate to Plot Congestion for Different Source/Destination
vii. Simulate to Determine the Performance with respect to Transmission of Packets