

Cybersecurity Course Units / Modules:

The course in Cyber Security and Ethical Hacking consists of the following modules:

1. Introduction to Cybersecurity

- Overview of cybersecurity concepts and the importance of protecting information systems
 - Key cybersecurity terminologies
 - Cybersecurity frameworks and best practices
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2. Network Security Basics

- Understanding network infrastructure and security protocols
 - Securing networks through firewalls, VPNs, and IDS/IPS
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3. Operating System Security

- Securing Windows and Linux operating systems
 - File system permissions and user management
 - Hardening operating systems against attacks
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4. Cryptography and Encryption

- Principles of cryptography
 - Symmetric and asymmetric encryption
 - Digital signatures and certificates
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5. Cyber Threats and Attack Vectors

- Common cyber threats, including malware, phishing, ransomware, and social engineering
 - Attack vectors and their countermeasures
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6. Penetration Testing

- Introduction to penetration testing methodologies
 - Tools and techniques for ethical hacking (e.g., Kali Linux)
 - Vulnerability scanning and exploitation
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7. Vulnerability Assessment

- Tools and techniques for vulnerability assessment (e.g., Nessus, OpenVAS)
 - Performing penetration testing using tools like Metasploit, Nmap, and Wireshark
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8. Web Application Security

- Common web vulnerabilities such as SQL injection, cross-site scripting (XSS), and cross-site request forgery (CSRF)
 - Securing web applications using OWASP guidelines
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9. Cloud Security

- Introduction to cloud computing and cloud security challenges
 - Securing cloud infrastructures (IaaS, PaaS, SaaS)
 - Identity and Access Management (IAM) in cloud environments
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10. Incident Response and Forensics

- Incident response planning and execution
- Forensics and evidence collection
- Disaster recovery and business continuity planning

11. Cybersecurity Laws and Ethics

- Overview of cybersecurity laws, data protection regulations, and ethical considerations
 - Complying with cybersecurity standards (GDPR, Kenyan Cybersecurity Act)
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12. Emerging Trends in Cybersecurity

- Artificial Intelligence (AI) and machine learning in cybersecurity
- Cybersecurity challenges in IoT (Internet of Things)
- Quantum computing and its impact on cybersecurity