



## ECES – Certified Encryption Specialist (e-Learning)

EC-Council

Com certificação

- **Nível:**
  - **Duração:** 10h
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### Sobre o curso

The EC-Council Certified Encryption Specialist (ECES) program introduces professionals and students to the field of cryptography. The participants will learn the foundations of modern symmetric and key cryptography including the details of algorithms such as Feistel Networks, DES, and AES.

Other topics introduced:

- Overview of other algorithms such as Blowfish, Twofish, and Skipjack
- Hashing algorithms including MD5, MD6, SHA, Gost, RIPEMD 160 and others.
- Asymmetric cryptography including thorough descriptions of RSA, ElGamal, Elliptic Curve, and DSA.
- Significant concepts such as diffusion, confusion, and Kerckhoff's principle.

Participants will also be provided a practical application of the following:

- How to set up a VPN
  - Encrypt a drive
  - Hands-on experience with steganography
  - Hands on experience in cryptographic algorithms ranging from classic ciphers like Caesar cipher to modern day algorithms such as AES and RSA.
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### Destinatários

Anyone involved in the selection and implementation of VPN's or digital certificates should attend this course. Without understanding the cryptography at some depth, people are limited to following marketing hype. Understanding the actual cryptography allows you to know which one to select. A person successfully completing this course will be able to select the encryption standard that is most beneficial to their organization and understand how to effectively deploy that technology. This course is excellent for ethical hackers and penetration testing professionals as most penetration testing courses skip cryptanalysis completely. Many penetration testing professionals testing usually don't attempt to crack cryptography. Basic knowledge of cryptanalysis is very beneficial to any penetration testing.

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## Objetivos

### What you will learn:

- Types of Encryption Standards and their differences
- How to select the best standard for your organization
- How to enhance your pen-testing knowledge in encryption
- Correct and incorrect deployment of encryption technologies
- Common mistakes made in implementing encryption technologies
- Best practices when implementing encryption technologies

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## Condições

Cursos E-learning EC-Council não beneficiam de isenção de IVA. Ao valor apresentado acresce IVA.

O exame da EC-Council incluído no valor do curso é, por defeito, realizado em formato remoto (online), sem custos adicionais.

Caso o formando pretenda realizar o exame presencialmente num dos Centros de Exames GALILEU/Rumos, poderá solicitar a conversão do voucher, sendo aplicada uma taxa adicional de 109,50€ + IVA.

**Mensalidades (apenas para particulares):** Taxa de inscrição de 10% + pagamento do valor restante em prestações flexíveis, sem juros, à escolha do cliente, através do parceiro Cofidis Pay. (Sujeito a aprovação, consulta-nos para mais informações).

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## Metodologia

### Este curso e-learning inclui

- Instructor-led, streaming vídeo training modules – Acesso durante 1 ano
- Acesso iLabs – Virtual lab platform – Acesso durante 6 meses
- Manual digital
- Certificado de participação
- Voucher de exame de certificação

### The Exam

- Number of Questions: 50
- Required Passing Score: 70%
- Test Duration: 2 Hours
- Test Format: Multiple Choice
- Test Delivery: EC-Council Exam Center (ECC EXAM)

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## Programa

- Introduction and History of Cryptography
- Symmetric Cryptography & Hashes
- Number Theory and Asymmetric Cryptography
- Applications of Cryptography
- Cryptanalysis

### **Introduction and History of Cryptography**

- What is Cryptography?
- History
- Mono-Alphabet Substitution
- Caesar Cipher
- Atbash Cipher
- ROT 13
- Scytale
- Single Substitution Weaknesses
- Multi-Alphabet Substitution
- Cipher Disk
- Vigenère Cipher
- Vigenère Cipher: Example
- Breaking the Vigenère Cipher
- Playfair
- The ADFGVX cipher
- The Enigma Machine
- CrypTool

### **Symmetric Cryptography & Hashes**

- Symmetric Cryptography
- Information Theory
- Information Theory Cryptography Concepts
- Kerckhoffs's Principle
- Substitution
- Transposition
- Substitution and Transposition
- Binary Math
- Binary AND
- Binary OR
- Binary XOR
- Block Cipher vs. Stream Cipher
- Symmetric Block Cipher Algorithms
- Basic Facts of the Feistel Function

- The Feistel Function
- A Simple View of a Single Round
- Unbalanced Feistel Cipher
- DES
- 3DES
- DESx
- Whitening
- AES
- AES General Overview
- AES Specifics
- Blowfish
- Serpent
- Twofish
- Skipjack
- IDEA
- Symmetric Algorithm Methods
- Electronic Codebook (ECB)
- Cipher-Block Chaining (CBC)
- Propagating Cipher-Block Chaining (PCBC)
- Cipher Feedback (CFB)
- Output Feedback (OFB)
- Counter (CTR)
- Initialization Vector (IV)
- Symmetric Stream Ciphers
- Example of Symmetric Stream Ciphers: RC4
- Example of Symmetric Stream Ciphers: FISH
- Example of Symmetric Stream Ciphers: PIKE
- Hash
- Hash - Salt
- MD5
- The MD5 Algorithm
- MD6
- Secure Hash Algorithm (SHA)
- Fork 256
- RIPEMD - 160
- GOST
- Tiger
- CryptoBench

## **Number Theory and Asymmetric Cryptography**

- Asymmetric Encryption
- Basic Number Facts
- Prime Numbers
- Co-Prime

- Eulers Totient
- Modulus Operator
- Fibonacci Numbers
- Birthday Problem
- Birthday Theorem
- Birthday Attack
- Random Number Generators
- Classification of Random Number Generators
- Naor-Reingold and Mersenne Twister Pseudorandom Function
- Linear Congruential Generator
- Lehmer Random Number Generator
- Lagged Fibonacci Generator
- Diffie-Hellman
- Rivest Shamir Adleman (RSA)
- RSA - How it Works
- RSA Example
- Menezes-Qu-Vanstone
- Digital Signature Algorithm
- Signing with DSA
- Elliptic Curve
- Elliptic Curve Variations
- Elgamal
- CrypTool

## **Applications of Cryptography**

- Digital Signatures
- What is a Digital Certificate?
- Digital Certificates
- X.509
- X.509 Certificates
- X.509 Certificate Content
- X.509 Certificate File Extensions
- Certificate Authority (CA)
- Registration Authority (RA)
- Public Key Infrastructure (PKI)
- Digital Certificate Terminology
- Server-based Certificate Validation Protocol
- Digital Certificate Management
- Trust Models
- Certificates and Web Servers
- Microsoft Certificate Services
- Windows Certificates: certmgr.msc
- Authentication
- Password Authentication Protocol (PAP)

- Shiva Password Authentication Protocol (S-PAP)
- Challenge-Handshake Authentication Protocol (CHAP)
- Kerberos
- Components of Kerberos System
- Pretty Good Privacy (PGP)
- PGP Certificates
- Wifi Encryption
- Wired Equivalent Privacy (WEP)
- WPA - Wi-Fi Protected Access
- WPA2
- SSL
- TLS
- Virtual Private Network (VPN)
- Point-to-Point Tunneling Protocol (PPTP)
- PPTP VPN
- Layer 2 Tunneling Protocol VPN
- Internet Protocol Security VPN
- SSL/VPN
- Encrypting Files
- Backing up the EFS key
- Restoring the EFS Key
- Bitlocker
- Bitlocker: Screenshot
- Disk Encryption Software: Truecrypt
- Steganography
- Steganography Terms
- Historical Steganography
- Steganography Details
- Other Forms of Steganography
- Steganography Implementations
- Demonstration
- Steganalysis
- Steganalysis - Raw Quick Pair
- Steganalysis - Chi-Square Analysis
- Steganalysis - Audio Steganalysis
- Steganography Detection Tools
- National Security Agency and Cryptography
- NSA Suite A Encryption Algorithms
- NSA Suite B Encryption Algorithms
- National Security Agency: Type 1 Algorithms
- National Security Agency: Type 2 Algorithms
- National Security Agency: Type 3 Algorithms
- National Security Agency: Type 4 Algorithms
- Unbreakable Encryption

## **Cryptanalysis**

- Breaking Ciphers
- Cryptanalysis
- Frequency Analysis
- Kasiski
- Cracking Modern Cryptography
- Cracking Modern Cryptography: Chosen Plaintext Attack
- Linear Cryptanalysis
- Differential Cryptanalysis
- Integral Cryptanalysis
- Cryptanalysis Resources
- Cryptanalysis Success
- Rainbow Tables
- Password Cracking
- Tools