

EC-Council

The All-New

C|EH[®]v12
Certified Ethical Hacker

1 LEARN

2 CERTIFY

3 ENGAGE

4 COMPETE

Attain the World's No.1 Credential in
Ethical Hacking

Build your career with the most in-demand cybersecurity certification in the world:

THE CERTIFIED ETHICAL HACKER

The World's No. 1 Ethical Hacking Certification for 20 Years



Ranked #1
In Ethical Hacking
Certifications by ZDNet



Ranked as a Top 10
Cybersecurity Certification



C|EH® Ranks 4th
Among Top 50 Leading
Cybersecurity Certifications

Who is a Certified Ethical Hacker?

A Certified Ethical Hacker is a specialist typically working in a red team environment, focused on attacking computer systems and gaining access to networks, applications, databases, and other critical data on secured systems. A C|EH® understands attack strategies, the use of creative attack vectors, and mimics the skills and creativity of malicious hackers. Unlike malicious hackers and actors, Certified Ethical Hackers operate with permission from the system owners and take all precautions to ensure the outcomes remain confidential. Bug bounty researchers are expert ethical hackers who use their attack skills to uncover vulnerabilities in the systems.



What is C|EH® v12?

The Certified Ethical Hacker has been battle-hardened over the last 20 years, creating hundreds of thousands of Certified Ethical Hackers employed by top companies, militaries, and governments worldwide.

In its 12th version, the Certified Ethical Hacker provides comprehensive training, hands-on learning labs, practice cyber ranges for engagement, certification assessments, cyber competitions, and opportunities for continuous learning into one comprehensive program curated through our new learning framework: 1. Learn 2. Certify 3. Engage 4. Compete.



The C|EH v12 also equips aspiring cybersecurity professionals with the tactics, techniques, and procedures (TTPs) to build ethical hackers who can uncover weaknesses in nearly any type of target system before cybercriminals do.

What's New in the C|EH® v12

LEARN | CERTIFY | ENGAGE | COMPETE

The C|EH® v12 is a specialized and one-of-a-kind training program to teach you everything you need to know about ethical hacking with hands-on training, labs, assessment, a mock engagement (practice), and global hacking competition. Stay on top of the game with the most in-demand skills required to succeed in the field of cybersecurity.


Master ethical hacking skills that go beyond the certification.

1 LEARN




Gain Skills

2 CERTIFY



Gain Recognition

3 ENGAGE



Gain Experience

4 COMPETE



Gain Respect

The new learning framework covers not only a comprehensive training program to prepare you for the certification exam but also the industry's most robust, in-depth, hands-on lab and practice range experience.

Enter the Hackerverse™ With the C|EH® v12

Enhance Your Ethical Hacking Career

1 LEARN

- 5 days of training
- 20 modules
- 3000+ pages of student manual
- 1900+ pages of lab manual
- Over 200 hands-on labs with competition flags
- Over 3,500 hacking tools
 - Learn how to hack multiple operating systems (Windows 11, Windows servers, Linux, Ubuntu, Android)
- MITRE Attack Framework
- Diamond model of intrusion analysis
- Techniques for establishing persistence
- Evading NAC and endpoint security
- Understand Fog, Edge, and Grid Computing Model

3 ENGAGE

- Conduct a real-world ethical hacking assignment
- Apply the 5 phases
 - Reconnaissance
 - Scanning
 - Gaining Access
 - Maintaining Access
 - Covering Your Tracks

2 CERTIFY

C|EH® ANSI

- 125 Multiple-Choice Questions
- 4 hours

C|EH® Practical

- 6-hour Practical Exam
- 20 Scenario-Based Questions

4 COMPETE

- New challenges every month
- 4-hour competition
- Compete with your peers all over the world
- Hack your way to the top of the leaderboard
- Gain recognition
- Challenges include:
 - OWASP Top 10 Web Application Threat Vectors
 - Ransomware/Malware Analysis
 - Outdated/Unpatched Software
 - System Hacking and Privilege Escalation
 - Web Application Hacking and Pen Testing
 - Cloud Attack/Hacking
 - and many more...

LEARN

The C|EH® v12 training program includes 20 modules covering various technologies, tactics, and procedures, providing prospective ethical hackers with the core knowledge needed to thrive in cybersecurity. Delivered through a carefully curated training plan that typically spans five days, the 12th version of the C|EH® continues to evolve to keep up with the latest OS, exploits, tools, and techniques. The concepts covered in the training program are split 50/50 between knowledge-based training and hands-on application through our cyber range. Every tactic discussed in training is backed by step-by-step labs conducted in a virtualized environment with live targets, live tools, and vulnerable systems. Through our lab technology, every participant will have comprehensive hands-on practice to learn and apply their knowledge.”

20

REFRESHED
MODULES

3000+

PAGES OF
STUDENT MANUAL

Course Outline

20 Modules That Help You Master the Foundations of Ethical Hacking and Prepare to Take the C|EH Certification Exam

- | | |
|------------------|---|
| Module 01 | Introduction to Ethical Hacking
Cover the fundamentals of key issues in the information security world, including the basics of ethical hacking, information security controls, relevant laws, and standard procedures. |
| Module 02 | Foot Printing and Reconnaissance
Learn how to use the latest techniques and tools to perform foot printing and reconnaissance, a critical pre-attack phase of the ethical hacking process. |
| Module 03 | Scanning Networks
Learn different network scanning techniques and countermeasures. |
| Module 04 | Enumeration
Learn various enumeration techniques, such as Border Gateway Protocol (BGP) and Network File Sharing (NFS) exploits, and associated countermeasures. |

-
- Module 05** | **Vulnerability Analysis**
Learn how to identify security loopholes in a target organization's network, communication infrastructure, and end systems. Different types of vulnerability assessment and vulnerability assessment tools.
-
- Module 06** | **System Hacking**
Learn about the various system hacking methodologies—including steganography, steganalysis attacks, and covering tracks—used to discover system and network vulnerabilities.
-
- Module 07** | **Malware Threats**
Learn different types of malware (Trojan, virus, worms, etc.), APT and fileless malware, malware analysis procedure, and malware countermeasures.
-
- Module 08** | **Sniffing**
Learn about packet-sniffing techniques and how to use them to discover network vulnerabilities, as well as countermeasures to defend against sniffing attacks.
-
- Module 09** | **Social Engineering**
Learn social engineering concepts and techniques, including how to identify theft attempts, audit human-level vulnerabilities, and suggest social engineering countermeasures.
-
- Module 10** | **Denial-of-Service**
Learn about different Denial of Service (DoS) and Distributed DoS (DDoS) attack techniques, as well as the tools used to audit a target and devise DoS and DDoS countermeasures and protections.
-
- Module 11** | **Session Hijacking**
Understand the various session hijacking techniques used to discover network-level session management, authentication, authorization, and cryptographic weaknesses and associated countermeasures.
-
- Module 12** | **Evading IDS, Firewalls, and Honeypots**
Get introduced to firewall, intrusion detection system (IDS), and honeypot evasion techniques; the tools used to audit a network perimeter for weaknesses; and countermeasures.
-
- Module 13** | **Hacking Web Servers**
Learn about web server attacks, including a comprehensive attack methodology used to audit vulnerabilities in web server infrastructures and countermeasures.
-

-
- Module 14** | **Hacking Web Applications**
Learn about web application attacks, including a comprehensive web application hacking methodology used to audit vulnerabilities in web applications and countermeasures.
-
- Module 15** | **SQL Injection**
Learn about SQL injection attacks, evasion techniques, and SQL injection countermeasures.
-
- Module 16** | **Hacking Wireless Networks**
Understand different types of wireless technologies, including encryption, threats, hacking methodologies, hacking tools, Wi-Fi security tools, and countermeasures.
-
- Module 17** | **Hacking Mobile Platforms**
Learn Mobile platform attack vector, android and iOS hacking, mobile device management, mobile security guidelines, and security tools.
-
- Module 18** | **IoT Hacking**
Learn different types of IoT and OT attacks, hacking methodology, hacking tools, and countermeasures.
-
- Module 19** | **Cloud Computing**
Learn different cloud computing concepts, such as container technologies and server less computing, various cloud computing threats, attacks, hacking methodology, and cloud security techniques and tools.
-
- Module 20** | **Cryptography**
Learn about encryption algorithms, cryptography tools, Public Key Infrastructure (PKI), email encryption, disk encryption, cryptography attacks, and cryptanalysis tools.

HANDS-ON LEARNING LABS

With over 220 hands-on labs conducted in our cyber range environment, you will have the opportunity to practice every learning objective on live machines and vulnerable targets in the course. Pre-loaded with over 3,500 hacking tools and various operating systems, you will gain unprecedented exposure and hands-on experience with the most common security tools, latest vulnerabilities, and widely used operating systems in the industry. Our range is web accessible, making it easier for you to learn and practice from anywhere.

What's Covered:

100% virtualization for a complete learning experience

Wide range of target platforms to hone your skills

After login, you will have full access to pre-configured targets, networks, and the attack tools necessary to exploit them:

- Pre-configured vulnerable websites
- Vulnerable, unpatched operating systems
- Fully networked environments
- 3,500+ hacking tools
- And much more!

519 attack techniques

Objective-oriented flags for critical thinking and applied knowledge assessment

Cloud-based cyber range



2 CERTIFY

Prove Your Skills and Abilities With Online, Practical Examinations

The Certified Ethical Hacker® credential is trusted globally as the industry standard for evaluating one's understanding of ethical hacking and security testing. As an ANSI 17024 accredited examination, the 150-question, 4-hour proctored exam is recognized across the globe as the original and most trusted tactical cyber security certification for ethical hackers. Certification domains are carefully vetted through industry practitioners, ensuring the certification maps to current industry requirements; this exam undergoes regular psychometric evaluation and tuning to ensure a fair and accurate measure of the candidate's knowledge in the ethical hacking domain.

Knowledge Exam

+

Skills Exam

Knowledge



C|EH[®]v12
Certified Ethical Hacker

4 Hours
Multiple-Choice Exam

+

Skills/Abilities



C|EH ETHICAL HACKER
PRACTICAL

6 Hours
20 Practical Challenges

=

Your Proof!



C|EH
Certified Ethical Hacker
MASTER

Attain
Mastery!



Certified Ethical Hacker (C|EH®) Certification

The C|EH® exam is a 4-hour exam with 125 multiple-choice questions. This knowledge-based exam will test your skills in information security threats and attack vectors, attack detection, attack prevention, procedures, methodologies, and more!

Access our Exam Blueprint for C|EH®

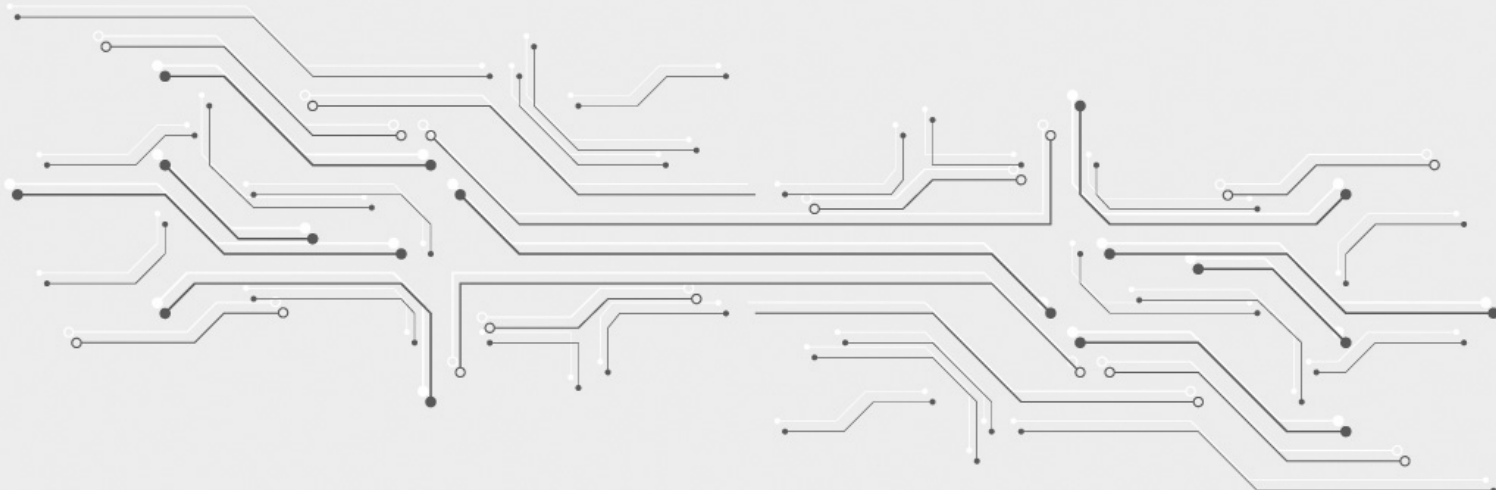
[Download Now](#)

C|EH® Practical Certification

The C|EH® Practical is a 6-hour, 100% hands-on exam delivered in our Cyber Range that requires you to demonstrate skills and abilities of ethical hacking techniques such as:

- Port scanning tools (e.g., Nmap, Hping)
- Vulnerability detection
- Attacks on a system (e.g., DoS, DDoS, session hijacking, web server and web application attacks, SQL injection, wireless threats)
- SQL injection methodology and evasion techniques
- Web application security tools (e.g., Acunetix WVS)
- SQL injection detection tools (e.g., IBM Security AppScan)
- Communication protocols

This is the next step to becoming a C|EH® Master after you have achieved your C|EH® certification. Within the C|EH® Practical, you have limited time to complete 20 challenges to test your skills and proficiency in a performance-based cyber range. This exam is NOT a simulation and incorporates a live corporate network of VMs and applications with solutions to uncover vulnerabilities.



C|EH® Master

Upon completing the C|EH® (Master) program, consisting of the C|EH® and C|EH® (Practical), the C|EH® (Master) designation is awarded. C|EH® Masters have shown proficiency at a master level in the knowledge, skills, and abilities of ethical hacking with a total of 6 hours of testing to prove their competency. The top 10 performers in both C|EH® and C|EH® Practical exams are featured on the C|EH® Master Global Ethical Hacking Leader Board.

The C|EH® Exam at a Glance

Exam Details	C EH® (MCQ Exam)	C EH® (Practical)
Number of Questions/Practical Challenges	125	20
Test Duration	4 Hours	6 Hours
Test Format	Multiple Choice Questions	iLabs Cyber Range
Test Delivery	ECC EXAM, VUE	-
Availability	-	Aspen-iLabs
Exam Prefix	312-50 (ECC EXAM), 312-50 (VUE)	-
Passing Score	Refer to https://cert.eccouncil.org/faq.html	70%





The C|EH® v12 program helps you develop real-world experience in ethical hacking through the hands-on C|EH® practice environment. The C|EH® Engage equips you with the skills to prove that you have what it takes to be a great ethical hacker.

New to C|EH® v12, students will embark on their first emulated ethical hacking engagement. This 4-phase engagement requires students to think critically and test the knowledge and skills gained by capturing a series of flags in each phase, demonstrating the live application of skills and abilities in a consequence-free environment through EC-Council’s new Cyber Range.

As you complete your training and hands-on labs, the C|EH® Engage lets you apply everything you have learned in a mock ethical hacking engagement. This 4-part security engagement gives you a real ethical hacking engagement experience from start to finish against an emulated organization. Using our capture-the-flag-style range, you will complete your engagement by answering “flag” questions as you progress.

Your Mission

Whether this is your first engagement or you’re honing your skills, get ready to test your ethical hacking knowledge like never before! Once you’ve practiced through the hands-on guided labs, it’s time to apply your knowledge, take on the hacker persona, and find the vulnerabilities and weaknesses in ABCDorg—all built in our C|EH® Engage (practice range).

Target Organization Characteristics

ABCD is a Nationwide IT/ITES organization	Realistic segmented networks	DMZs’s and private subnets stretch across the infrastructure to support various business units	Various application servers and services support ABCDORG Operations
Real networks, real operating systems, and real applications	Private, dedicated access – no shared resources	Fully automated network deployment with EC-Council’s Cyber Range	24x7 browser-based access

Objectives:

Armed with your attack platform, Parrot OS, and a plethora of tools used by Ethical Hackers, you will embark on a 4-part engagement to assess ABCDorg’s security posture. Follow the process, practice your TTP and experience the real thing in a controlled environment with no consequences, just the ultimate learning experience to support your career as an Ethical Hacker! Each phase builds on the last as you progress through your ABCDorg’s engagement.

- Foot Printing & Reconnaissance
- Scanning
- Enumeration
- Vulnerability Analysis

PHASE 1 Vulnerability Assessment

- System Hacking
- Malware Threats
- Sniffing
- Social Engineering
- Denial-of-Service

PHASE 2 Gaining Access

- Hacking Wireless Networks
- Hacking Mobile Platforms
- IoT Hacking
- OT Hacking
- Cloud Computing
- Cryptography

PHASE 4 Mobile, IoT, OT Exploitation

PHASE 3 Perimeter and Web App Exploitation

- Session Hijacking
- Evading IDS
- Firewalls
- Honeypots
- Hacking Web Servers
- Hacking Web Applications
- SQL Injection

Put Your Skills and Knowledge to the Test With the C|EH® Master

Once you have achieved the certification and completed your ethical hacking engagement, you are ready to challenge the proctored C|EH® practical assessment and become a C|EH® Master!

4 COMPETE

Without a Stimulating Cyber Competition, There Can Be No Progress. Competitors Drive You to Be the Best You Can Be.

The C|EH® Global Challenges occur every month, providing capture-the-flag style competitions that give students exposure to various new technologies and platforms, from web applications, OT, IoT, SCADA, and ICS systems to cloud and hybrid environments. Our compete structure lets ethical hackers fight their way to the top of the leaderboard each month in these 4-hour curated CTFs. Objective-based flags are designed around the ethical hacking process, keeping skills current, testing critical thinking abilities, and covering the latest vulnerabilities and exploits as they are discovered. Hosted 100% online in EC-Council's Cyber Range, candidates race the clock in scenario-based engagements against fully developed network and application environments with real operating systems, real networks, tools, and vulnerabilities to practice, engage, compete, build, and hone their cyber skills against various new target organizations.

The All-New C|EH® Global Challenges

Each month will present a different theme and challenge with Capture-The-Flag style competitions focusing on ethical hackers' core skills and abilities. Gain exposure to new tools, focus on new attack vectors, and try to exploit emerging vulnerabilities while gaining continuing education credits and keeping your skills and certifications current

New Challenges Every Month!

Month	Skill Challenge
October 2022	OWASP Top 10 Web Application Threat Vectors
November 2022	Ransomware/Malware Analysis
December 2022	Outdated/Unpatched Software
January 2023	System Hacking and Privilege Escalation
February 2023	Web Application Hacking and Pen Testing
March 2023	Cloud Attack/Hacking
April 2023	Social Engineering/Phishing attacks
May 2023	IoT Attack/Hacking
June 2023	Wi-Fi Network Attack/Hacking
July 2023	DOS/DDoS Attack
August 2023	Mobile Attack/Hacking
September 2023	Supply Chain Cyber Attacks

Compete Until Everyone Knows You

As an Ethical Hacker, you will battle your way to the top of the monthly Leaderboards as you race the clock in these 4-hour CTF challenges. Open all month long, the choice is yours as to when you compete, but show up ready! All you need is a connection, compete through your browser, we provide the attack platform, the targets, and all the tools, you bring the skills to win!

Prerequisites

All you need is a connection, and you can compete through your browser. We provide the attack platform, the targets, and all the required tools. You bring the skills to win!



Compete Example Preview of Upcoming Challenges

Topic:
Ransomware/
Malware Analysis

Brief: You have been called in by a reputed MNC hit with malware recently. This has locked up their services and managed to infect a slew of customers that were also using their solution. The incident response team managed to extract some of the code, and now your job is to reverse engineer the malware and identify the encryption algorithms used, as well as identify any trace of command-and-control servers that may be helpful to law enforcement agencies.

Topic:
Application
Hardening

Brief: Your employer, a large financial institution, has suffered a breach where hackers were able to inject code into a web application that exposed sensitive customer data. Your company has faced tremendous scrutiny from the public and had to pay fines to its regulators. You have performed a series of manual and automated tests against the web application to identify weaknesses and provide recommended countermeasures to the app sec team.

Key Updates of C|EH® v12

Features:

1. New Learning Methodology: Learn – Certify – Engage – Compete
2. Compete: new challenges every month to test your job-ready skills!
3. 100% Compliance to NICE 2.0 Framework
4. Based on a comprehensive industry-wide job-task analysis
5. Hands-on learning labs
6. Practice Range
7. Global C|EH community competitions
8. Cheat Sheet
9. Coverage of the latest malware
10. Lab-intensive program (Every learning objective is demonstrated using labs)
11. Hands-on program (More than 50% of training time is dedicated to labs)
12. Lab environment simulates a real-time environment(Lab setup simulates real-life networks and platforms)
13. Covers the latest hacking tools (Based on Windows, macOS, and Linux)
14. Latest OS covered and a patched testing environment
15. All the tool screenshots are replaced with the latest version
16. All the tool listing slides are updated with the latest tools
17. All the countermeasure slides are updated

Technology Updates:

1. MITRE ATTACK Framework
2. Diamond Model of Intrusion Analysis
3. Techniques for Establishing Persistence
4. Evading NAC and Endpoint Security
5. Fog Computing
6. Edge Computing
7. Grid Computing

Updated OS

Windows 11	Windows Server 2022
Parrot Security	Windows Server 2019
Android	Ubuntu Linux

Course Content

3000+ Student Manual Pages	1900+ Lab Manual Pages
3500+ Hacking & Security Tools	220 Hands-On Lab Practicals
519 Attack Techniques	20 Refreshed Modules

Common Job Roles for C|EH

- Mid-Level Information Security Auditor
- Cybersecurity Auditor
- Security Administrator
- IT Security Administrator
- Cyber Defense Analyst
- Vulnerability Assessment Analyst
- Warning Analyst
- Information Security Analyst 1
- Security Analyst L1
- Infosec Security Administrator
- Cybersecurity Analyst level 1, level 2, & level 3
- Network Security Engineer
- SOC Security Analyst
- Security Analyst
- Network Engineer
- Senior Security Consultant
- Information Security Manager
- Senior SOC Analyst
- Solution Architect
- Cybersecurity Consultant

C|EH® v12 Exam Information

C|EH® (ANSI)

Exam Title:
Certified Ethical Hacker (ANSI)

Exam Code:
312-50 (ECC EXAM), 312-50 (VUE)

Number of Questions:
125

Duration:
4 hours

Availability:
ECCEXAM/VUE

Test Format:
Multiple Choice

Passing Score: Please refer to <https://cert.eccouncil.org/faq.html>

C|EH® PRACTICAL

Exam Title:
Certified Ethical Hacker (Practical)

Number of Practical Challenges:
20

Duration:
6 hours

Availability:
ASPEN iLabs

Test Format:
iLabs cyber range

Passing Score:
70%

Training

5
Days

Duration

40
Hours

Training Options

iLearn (Self-Study)

This solution is an asynchronous, self-study environment in a video streaming format

iWeek (Live Online)

This solution is a live, online, instructor-led training course

Master Class

The opportunity to learn from world-class instructors and collaborate with top Infosecurity professionals.

Training Partner (In Person)

This solution offers “in-person” training so that you can get the benefit of collaborating with your peers and gaining real-world skills, conveniently located in your backyard.

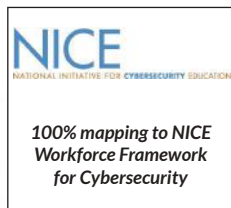
The NEW Vulnerability Assessment and Penetration Testing (VAPT) Track

How to achieve C|EH® and beyond!



Trusted By
FORTUNE 500 COMPANIES

C|EH® v12 Recognition / Endorsement / Mapping



The national Initiative for Cybersecurity Education (NIC)



American National Standards Institute (ANSI)



Committee on National Security Systems (CNSS)



United States Department of Defense (DoD)



National Infocomm Competency Framework (NICF)



MSC



KOMLEK

Why People Love C|EH®



“C|EH® certification made my CV outstanding compared to my peers, It has landed me an exciting role at EY.”

Sidhant Gupta, *Senior Security Consultant, Hall of Fame nominee*
(EC-Council, How C|EH® Helped Me, 2021)

“What C|EH® gives you is a 360-degree view. So, what it leaves you with is a desire to learn more and more about an infinitely large subject where the individual matters little and the team matters a lot.”

Lorenzo Neri, *Security Specialist, Hall of Fame finalist*

“Becoming a C|EH® Master has given me the belief that I can progress further in the cybersecurity industry and inspired me to go further with my professional qualifications, hopefully enabling me to attain CREST accreditation.”

Paul Mahoney, *Network security and resilience manager for a large ATM deployer,*
2021 Hall of Fame finalist

“I really like hands-on training, the labs are very intuitive. The program walks you through every step and breaks it down so you can understand it.”

Richard Medlin, *Pentester and Cybersecurity analyst, an active-duty Marine and newly inducted member of the C|EH® Hall of Fame*
(EC-Council, An Active Duty Marine’s Journey, 2021)



Discover Why C|EH® Is Trusted by Organizations Around the World!

For 20 years, EC-Council's cybersecurity programs have empowered cybersecurity professionals around the world to exercise their training and expertise to combat cyberattacks. The Hall of Fame celebrates those individuals who have excelled, achieved, and fostered a spirit of leadership among their colleagues and peers within the cyber community.

97%

Rated the program topics as directly relevant to current real-world threats.

63%

Reported a direct pay raise or promotion after attaining their C|EH® certification.

95%

Responded being able to improve organizational security after completing the program.

Download the C|EH® Hall of Fame Report



About EC-Council

EC-Council's sole purpose is to build and refine the cybersecurity profession globally. We help individuals, organizations, educators, and governments address global workforce problems by developing and curating world-class cybersecurity education programs and their corresponding certifications. We also provide cybersecurity services to some of the largest businesses globally. Trusted by 7 of the Fortune 10, 47 of the Fortune 100, the Department of Defence, Intelligence Community, NATO, and over 2,000 of the best Universities, Colleges, and Training Companies, our programs have proliferated through over 140 countries. They have set the bar in cybersecurity education. Best known for the Certified Ethical Hacker programs, we are dedicated to equipping over 2,30,000 information age soldiers with the knowledge, skills, and abilities required to fight and win against the black hat adversaries. EC-Council builds individual and team/organization cyber capabilities through the Certified Ethical Hacker Program, followed by a variety of other cyber programs, including Certified Secure Computer User, Computer Hacking Forensic Investigator, Certified Security Analyst, Certified Network Defender, Certified SOC Analyst, Certified Threat Intelligence Analyst, Certified Incident Handler, as well as the Certified Chief Information Security Officer.

We are an ANSI 17024 accredited organization and have earned recognition by the DoD under Directive 8140/8570 in the UK by the GCHQ, CREST, and various other authoritative bodies that influence the entire profession.

Founded in 2001, EC-Council employs over 400 individuals worldwide with ten global offices in the USA, UK, Malaysia, Singapore, India, and Indonesia. Its US offices are in Albuquerque, NM, and Tampa, FL.

Learn more at www.eccouncil.org



WE DON'T JUST TEACH
ETHICAL
HACKING
WE BUILD CYBER CAREERS

Attain the World's No.1 Credential in Ethical Hacking