CAREER PROFILE:
CRYPTOGRAPHER/CRYPTANALYST
AKA ENCRYPTION EXPERT

DEGREE REQUIRED?
Yes
Master’s Degree
Focusing on Mathematics or Computer Science is Encouraged

MEDIAN SALARY
+$100,000

JOB GROWTH
21%

SOFTWARE SKILLS
Intelligent, Analytical & Creative
Capable of Tackling Complex Mathematical Problems
Trustworthiness

COMMON JOB DUTIES
- Protect important information from interception, copying, modification and/or deletion
- Evaluate, analyze and target weaknesses in cryptographic security systems and algorithms
- Design robust security systems to prevent vulnerabilities
- Develop statistical and mathematical models to analyze data and solve security problems
- Test computational models for reliability and accuracy
- Investigate, research and test new cryptology theories and applications
- Probe for weaknesses in communication lines (e.g. wireless network, secure telephone, cellphones, email, etc.)
- Ensure message transmission data (e.g. wireless network, secure telephone, cellphones, email, etc.) are not illegally accessed or altered in transit
- Decode cryptic messages and coding systems for military, political and/or law enforcement agencies
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**CAREER PROFILE:**

**CYBER CRIME INVESTIGATOR**

**DEGREE REQUIRED?**
- **NO**
  - Certification(s) encouraged but not essential
  - Experience can supplement

**MEDIAN SALARY**
- **+$67,000**

**JOB GROWTH**
- **10%**

**SOFTWARE SKILLS**
- Curiosity & Persistence
- Strong Communication
- Information Use
- Critical Thinking

**COMMON JOB DUTIES**
- Find and navigate the dark web
- Process crime scenes
- Conduct interviews of victims, witnesses, and/or suspects
- Examine recovered data for information
- Fuse computer network attack analyses with criminal and counterintelligence investigations and operations
- Determine whether a security incident is indicative of a violation of law that requires specific legal action
- Identify elements of proof of the crime
- Identify, collect, and seize documentary or physical evidence, to include digital media and logs associated with cyber intrusion incidents, investigations, and operations
- Provide criminal investigative support to trial counsel during the judicial process
- Prepare reports to document the investigation

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No Bachelor’s Degree in Cybersecurity or Computer Science is a plus though

+$80,000

+20%

Capable of Handling Stress
Flexible
Problem-Solving
Analytical
Good Communication

▶ Actively monitor systems and networks for intrusions
▶ Identify security flaws and vulnerabilities
▶ Perform security audits, risk analysis, network forensics and penetration testing
▶ Perform malware analysis and reverse engineering
▶ Develop a procedural set of responses to security problems
▶ Establish protocols for communication within an organization and dealings with law enforcement during security incidents
▶ Create a program development plan that includes security gap assessments, policies, procedures, playbooks, training and tabletop testing
▶ Produce detailed incident reports and technical briefs for management, admins and end-users
▶ Liaison with other cyber threat analysis entities
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CAREER PROFILE:

CYBER FORENSICS EXPERT

DEGREE REQUIRED?
Yes
Bachelor’s Degree in Cybersecurity or Computer Science
[Master’s Degree in Computer Forensics helps]

MEDIAN SALARY
+$70,000

JOB GROWTH
+28%

SOFTWARE SKILLS
Curiosity & Insight
Strong Communication
Ability to Write Reports & Explain Evidence, Potentially in Front of Lawyers & Judges

COMMON JOB DUTIES
- Conduct data breach and security incident investigations
- Recover and examine data from computers and electronic storage devices
- Dismantle and rebuild damaged systems to retrieve lost data
- Identify additional systems/networks compromised by cyber attacks
- Compile evidence for legal cases
- Draft technical reports, write declarations and prepare evidence for trial
- Give expert counsel to attorneys about electronic evidence in a case
- Advise law enforcement on the credibility of acquired data
- Train law enforcement officers on computer evidence procedures
- Keep abreast of emerging technologies, software and methodologies

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**CAREER PROFILE:**

**CYBER LEGAL ADVISOR**

**DEGREE REQUIRED?**

*Yes*

Juris Doctorate Degree is required

**MEDIAN SALARY**

*$92,000*

**JOB GROWTH**

*28%*

**SOFT SKILLS**

Good communicator
Good listener
Approachable
Interpersonal skills

**COMMON JOB DUTIES**

▷ Advocate for an organization in legal and legislative proceedings
▷ Evaluate contracts
▷ Evaluate regulations, policies and procedures
▷ Interpret and apply laws
▷ Evaluate the impact of changes to laws and regulations
▷ Resolve conflicts in policies and procedures
▷ Maintain a working knowledge of relevant constitutional issues
▷ Help implement changes to laws
▷ Provide legal guidance to management, personnel, or clients

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DEGREE REQUIRED?
Yes
Bachelor’s Degree in Cybersecurity or Computer Science

MEDIAN SALARY
+$90,000

JOB GROWTH
+20%

SOFT SKILLS
Complex Problem Solving
Creativity
Strong Communication
Ability to Work in a Team
Capable of Handling Stress

COMMON JOB DUTIES
▶ Create new ways to solve existing production security issues
▶ Configure and install firewalls and intrusion detection systems
▶ Perform vulnerability testing, risk analyses and security assessments
▶ Develop automation scripts to handle and track incidents
▶ Investigate intrusion incidents, conduct forensic investigations and mount incident responses
▶ Collaborate with colleagues on authentication, authorization and encryption solutions
▶ Evaluate new technologies and processes that enhance security capabilities
▶ Test security solutions using industry standard analysis criteria
▶ Respond to information security issues during each stage of a project’s lifecycle
▶ Define, implement and maintain corporate security policies

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CAREER PROFILE:
INFORMATION SYSTEMS SECURITY MANAGER

DEGREE REQUIRED?
Yes
Bachelor’s Degree in Cybersecurity or Computer Science

MEDIAN SALARY
$110,000

JOB GROWTH
+20%

SOFT SKILLS
Strong Leadership
Good Communication
Efficient Multi-tasker
Creative Problem Solver
Comfortable Delegating

COMMON JOB DUTIES
- Manage organizational resources (time, money, personnel, etc.) to support security goals and policies
- Create and execute strategies to improve the reliability and security of IT projects
- Define, implement and maintain corporate security policies and procedures
- Spearhead vulnerability audits, forensic investigations and mitigation procedures
- Respond immediately to security-related incidents and provide a thorough post-event analysis
- Manage a diverse team of security administrators, analysts and IT professionals
- Advise leadership on organization’s cybersecurity status
- Institute organization-wide training in security awareness, protocols and procedures
- Assess, test and select new security products and technologies

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**CAREER PROFILE:**

**IT PROJECT MANAGER**

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**DEGREE REQUIRED?**

Yes

Bachelor’s Degree in Systems Management, Strategic Planning, Engineering & Technology, or Related Field

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**MEDIAN SALARY**

+$97,000

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**JOB GROWTH**

12%

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**SOFT SKILLS**

Leadership & Team Building
Resource Management
Technology Use
Systems Thinking

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**COMMON JOB DUTIES**

- Develop methods to monitor and measure risk, compliance, and assurance efforts
- Provide advice on project costs, design concepts, or design changes
- Review or conduct audits of information technology (IT) programs and projects
- Manage end-to-end customer service
- Gather feedback on customer satisfaction and internal service performance to foster continual improvement
- Develop supply chain, system, network, performance, and cybersecurity requirements
- Identify and address cyber workforce planning and management issues (e.g. recruitment, retention, and training)
- Lead and oversee budget, staffing, and contracting
- Draft and publish supply chain security and risk management documents

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MULTI-DISCIPLINED LANGUAGE ANALYST

DEGREE REQUIRED?
Yes
Bachelor’s Degree in target language is encouraged if applicant is not a native speaker

MEDIAN SALARY
$55,000

JOB GROWTH
42%

COMMON JOB DUTIES
➤ Analyze and process information using language and cultural expertise
➤ Compile and interpret data for intelligence
➤ Assess a target’s motivation and frame of reference for intelligence context
➤ Analyze metadata to look for patterns, anomalies, or events
➤ Identify cyber threat tactics
➤ Identify foreign languages and dialects in initial source data
➤ Help optimize the development of language processing tools
➤ Analyze social network activities
➤ Translate voice and graphic data
➤ Identify cyber or technology-related terminology used in target languages

SOFT SKILLS
Good Communicator
Detail-oriented
Analytical
Identify contexts & subtleties in written & verbal communications
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SOFTWARE DEVELOPER

DEGREE REQUIRED?
Yes
Associate’s Degree
(A Bachelor’s or Master’s in Computer Science is Encouraged)

MEDIAN SALARY
$70,000

JOB GROWTH
24%

SOFT SKILLS
Good Communicator
Able to Work on a Team
Analytical
Meet Deadlines

COMMON JOB DUTIES
- Develops, creates, maintains, and write/code computer applications, software, or utility programs
- Design, implement, and test software
- Assist in the development of a company-wide software security strategy
- Facilitate meetings and workshops to define client processes and needs
- Create new software systems or forensic tools
- Participate in the life-cycle development of software systems using different methodologies
- Design and build proof-of-concept prototype solutions
- Institute programming techniques that are free from logical design and technical implementation flaws
- Gain a thorough knowledge of attack vectors that may be used to exploit software
- Support software deployments to customers

for (int i = 0; i < n1; i++)
    for (int j = i + 1; j < n2; j++)
        if (less(a[i]), a[j]))
            exchange(a, i, j);
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CAREER PROFILE: TECHNICAL SUPPORT SPECIALIST

DEGREE REQUIRED? NO
Certification(s) encouraged but not essential
Experience can supplement

MEDIAN SALARY $50,000

JOB GROWTH 11%

COMMON JOB DUTIES
- Install and maintain network infrastructures, device operating systems
- Troubleshoot system hardware and software issues
- Analyze incident data for emerging trends
- Develop and deliver technical training to users and other customers
- Diagnose and resolve customer-reported system incidents, problems, and security events
- Make recommendations based on trend analysis for changes to software and hardware to enhance user experience
- Install and configure hardware, software, and other equipment for system users that adheres to security standards
- Administer accounts, network rights, and access to systems and equipment
- Perform asset management/inventory of information technology (IT) resources

SOFT SKILLS
- Complex Problem Solving
- Systems Thinking
- Attention to Detail
- Resource Management

for more info
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DEGREE REQUIRED?
No
Real-world experience is much more valued than a degree, though a degree won’t hurt

MEDIAN SALARY
$75,000

JOB GROWTH
+20%

SOFTWARE SKILLS
Alternative Problem Solving
Curious & Creative
Attention to Detail
Strong Communication
Interest in Hacking

COMMON JOB DUTIES

- Identify critical flaws in applications and systems that cyber attackers could exploit
- Conduct vulnerability assessments for networks, applications and operating systems
- Conduct network security audits and scanning on a predetermined basis
- Use automated tools (e.g. Nessus) to pinpoint vulnerabilities and reduce time-consuming tasks
- Use manual testing techniques and methods to gain a better understanding of the environment and reduce false negatives
- Develop, test and modify custom scripts and applications for vulnerability testing
- Compile and track vulnerabilities over time for metrics purposes
- Write and present a comprehensive Vulnerability Assessment and maintain a database
- Supply hands-on training for network and systems administrators
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**CAREER PROFILE:**

**CYBER OPERATOR**

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**DEGREE REQUIRED?**

Yes
Bachelor’s in Computer Science/Engineering Certification(s) recommended

**MEDIAN SALARY**

+$100,000

**JOB GROWTH**

20%

**SOFT SKILLS**

Critical Thinking
Excellent Communication (written and verbal)
Analytical

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**COMMON JOB DUTIES**

- Analyze network architecture, tools and procedures for ways to improve performance
- Identify potential points of strength and vulnerability within a network
- Collect and process information on wireless networks and connected devices
- Deploy, test, and utilize network tools
- Monitor and track diagnostic information on network health
- Operate and maintain automated systems for gaining access to networks
- Collaborate with development organizations to create and deploy the tools needed to achieve objectives
- Conduct exploitation testing of devices and networks

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**CAREER PROFILE:**

**SYSTEM TESTING & EVALUATION SPECIALIST**

**DEGREE REQUIRED?**

No
Certification(s) recommended; experience can supplement

**MEDIAN SALARY**

+$47,000

**JOB GROWTH**

+20%

**SOFT SKILLS**

Planning & organization
Problem-solving
Analytical
Systems thinking

**COMMON JOB DUTIES**

- Develop test plans to address specifications and requirements
- Analyze the results of software, hardware, or interoperability testing
- Test, evaluate, and verify hardware and/or software to determine compliance with defined specifications and requirements
- Install and maintain network infrastructure device operating system software (e.g., IOS, firmware)
- Make recommendations based on test results
- Perform developmental testing on systems under development
- Record and manage test data
- Validate specifications and requirements for testability

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CAREER PROFILE:

SYSTEMS ADMINISTRATOR

DEGREE REQUIRED?
No
However, Bachelor of Science in IT/Network Administration recommended

MEDIAN SALARY
+$62,000

JOB GROWTH
+8%

COMMON JOB DUTIES
- Manage accounts, network rights, and access to systems and equipment
- Maintain baseline system security according to organizational policies
- Provide ongoing optimization and problem-solving support
- Install, update, and troubleshoot systems/servers
- Troubleshoot hardware/software interface and interoperability problems
- Oversee installation, implementation, configuration, and support of system components
- Manage system/server resources including performance, capacity, availability, serviceability, and recoverability
- Design group policies and access control lists to ensure compatibility with organizational standards, business rules, and needs

SOFT SKILLS
- Strong Leader & Communicator
- Organization
- Problem-Solver
- Analytical

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**DEGREE REQUIRED?**

No
But Bachelor’s Degree is recommended
Certifications encouraged

**MEDIAN SALARY**

+$83,000

**JOB GROWTH**

~20%

**SOFTWARE SKILLS**

Adaptability
Good judgement
Teamwork
Good communicator

**COMMON JOB DUTIES**

- Develop detailed plans of cyber operations (cyber ops) and leads teams in executing the plans
- Communicate complex information, concepts, and ideas through verbal, written, or visual means
- Develop plans for how to handle potential cybersecurity crisis
- Use policy expertise to help develop, negotiate, and staff action plans for cyber ops
- Identify cyber intelligence gaps and shortfalls for cyber operational planning
- Document “lessons learned” that convey the results of events and/or exercises
- Maintain situational awareness of cyber-related intelligence requirements
- Prepare and present cyber ops briefings

**CYBEROPS PLANNER**

CAREER PROFILE:

No
But Bachelor’s Degree is recommended
Certifications encouraged

+83,000

~20%

Adaptability
Good judgement
Teamwork
Good communicator
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CAREER PROFILE:
INFORMATION ASSURANCE ANALYST

DEGREE REQUIRED?
Yes
Bachelor’s in Cybersecurity or Computer Science
Master’s Degree Encouraged

MEDIAN SALARY
$100,000

JOB GROWTH
31%

SOFT SKILLS
- Organized
- Ability to Work Well
- Under Pressure
- Analytical

COMMON JOB DUTIES
- Develop and implement plans to safeguard various types of files and stored data
- Configure, install, operate, & maintain hardware & software for an organization
- Develop new and evolve existing infrastructure and participate in technical research to identify industry best-practices
- Ensure all organization operating systems, software, & system hardware are protected, and compliant with rules & policies
- Perform regular security checks
- Verify the integrity and availability of all technological resources (servers, hardware, software, and other relevant systems)
- Review system and application logs to determine if backup procedures are functioning
- Maintain all relevant documentation related to information security
- Analyze organization’s information assurance policy

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CAREER PROFILE:

KNOWLEDGE MANAGER

DEGREE REQUIRED?
No
But Bachelor's Degree is recommended
Certifications encouraged

MEDIAN SALARY
$75,000

JOB GROWTH
11%

SOFT SKILLS
Multitasking
Leadership
Big-picture vision
Responsible

COMMON JOB DUTIES
- Help organizations to identify, document, and access intellectual assets like employee expertise, best practices, and organizational knowledge
- Perform information searches, knowledge mapping, and knowledge management
- Knowledge of laws, regulations, policies, and ethics as they relate to cybersecurity and privacy
- Ensuring compliance with Payment Card Industry and Personal Health Information data security standards
- Design, build, implement, and maintain a knowledge management framework that provides end-users access to the organization's intellectual capital
- Promote knowledge sharing between information owners/users through an organization's operational processes and systems
- Lead efforts to promote the organization's use of knowledge management and information sharing

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CAREER PROFILE: PEN TESTER

DEGREE REQUIRED?
Yes
Bachelor’s Degree in Cybersecurity or Computer Science

MEDIAN SALARY
$85,000

JOB GROWTH
30%

SOFT SKILLS
Ability to Learn Quickly
Teamwork
Strong Written & Verbal Communication

COMMON JOB DUTIES
- Identify and attempt to exploit weaknesses in computer networks and systems
- Simulate cyber attacks and data breaches to access secure information
- Bypass established security protocols and other network defenses
- Document process and create detailed reports of weaknesses in systems
- Ethically hack into computer networks and data servers
- Identify and configure tools to break into computers, networks, and servers
- Communicate exposed vulnerabilities and risk-level of computer systems and networks
- Educate organizations and staff on areas of risk and cyber-safety best practices
- Cooperate with upper-management and law enforcement

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DEGREE REQUIRED?
Yes
Bachelor’s in Cybersecurity, IT, or Computer Science
Certifications Encouraged

MEDIAN SALARY
$119,000

JOB GROWTH
30%

SOFT SKILLS
Collaborative
Ability to Work Well Under Pressure
Analytical

COMMON JOB DUTIES
▶ Provide subject matter expertise to the development of cyber operations-specific indicators
▶ Monitor open source websites for hostile content directed towards organizational or partner interests
▶ Collaborate with intelligence analysts and targeting organizations involved in related areas
▶ Conduct in-depth research and analysis
▶ Use gathered intelligence to counter incoming threats and prevent potential threats
▶ Provide current intelligence support to critical internal/external stakeholders as appropriate
▶ Identify threat tactics and methodologies
▶ Provide evaluation and feedback necessary for improving intelligence production, intelligence reporting, collection requirements, and operations

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