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FEDERAL GOVERNMENT UNIVERSITY

COMPLETE SLIDES

Cyber Security

CS627

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Importance of Cyber Security

- **Mobile Phones**
- Total population of Pakistan (2020) → **219,067,896**
- Number of **mobile phone users in Pakistan** has reached 161.183 million, as of May **2019**.
 - Smart phones
 - Traditional phones:
 - SMS / Call Scams

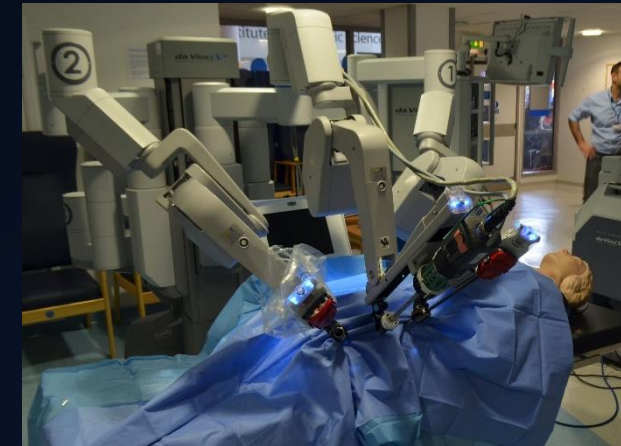
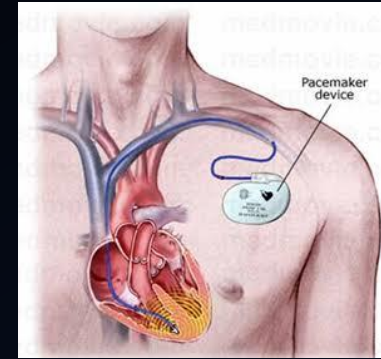
Importance of Cyber Security

- **Drones**
 - **Here's How Hackers Could Have Spied On Your DJI Drone Account**
 - https://thehackernews.com/2018/11/dji-drone-hack_8.html

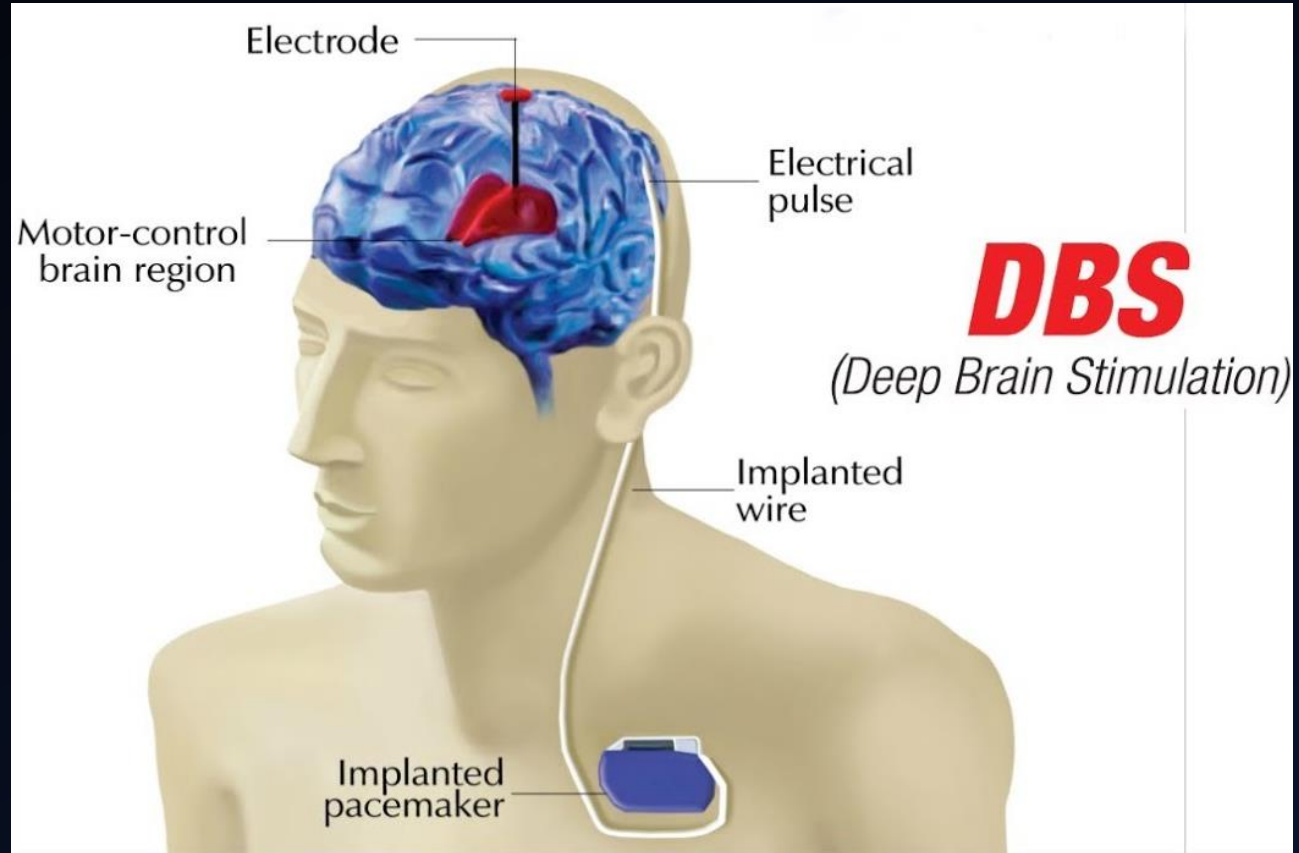


Importance of Cyber Security

- Health / Medical
 - **Pacemaker**: a device for stimulating the heart muscle and regulating its contractions.
 - **Robotic Surgeons**
 - 5 Medical Robots Making a Difference in Healthcare
 - <https://online-engineering.case.edu/blog/medical-robots-making-a-difference>
 - **Remote Surgery**
 - China completes world's first 5G remote surgery in test on animal
 - <https://www.youtube.com/watch?v=yFR61jjL1vo>
 - Robot Helps Perform First Long-Distance Heart Surgery
 - A surgeon in India performed the first remote heart operation on a patient 20 miles away.
 - <https://www.popularmechanics.com/technology/robots/a28941179/robot-performs-first-long-distance-heart-surgery/>



Bluetooth in health



- The field of 'Cyber Security' is becoming more important due to increased reliance on
 - computer systems
 - the [Internet](#)
 - [wireless network](#) standards
 - such as [Bluetooth](#) and [Wi-Fi](#)
 - due to the growth of ["smart" devices](#)
 - including [smartphones](#), [televisions](#), and the ["Internet of things"](#).
- Owing to its complexity, both in terms of politics and technology, cybersecurity is also one of the major challenges in the contemporary world.
 - Ease of use results in increasing underlying complexity

What is Cyber Security?

- Cyber
 - Relating to or characteristic of the culture of computers, information technology, and virtual reality.
 - **Cyberspace** is a term for virtual reality coined by William Gibson.
 - <https://en.wikipedia.org/wiki/Cyberspace>
 - **Cyber-** is derived from "**cybernetic**", [<https://en.wikipedia.org/wiki/Cybernetics>] which comes from the **Greek word** κυβερνητικός meaning '*skilled in steering or governing*'.
 - Pronunciation:
[<https://forvo.com/word/%CE%BA%CF%85%CE%B2%CE%B5%CF%81%CE%BD%CE%B7%CF%84%CE%B9%CE%BA%CF%8C%CF%82/>]
 - **Cybernetics**: the science of communications and automatic control systems in both machines and living things.
 - Used to describe **policies** and **politics** regarding **computer systems** and **networks**.
 - Term used in **Information Technology** industry and the **Internet** era.
 - https://en.wikipedia.org/wiki/Internet-related_prefixes#.22Cyber-.22
 - <https://en.wikipedia.org/wiki/Cyber>

What is Cyber Security?

- Security
 - Degree of 'protection' [safe & secure].
 - The state of being free from danger or threat.
 - **Security** is freedom from, or resilience against, potential harm caused by others. [Wikipedia]
 - <https://en.wikipedia.org/wiki/Security>

What is Cyber Security?

- **Computer security, cybersecurity or information technology security (IT security)** is the protection of computer systems from the theft of or damage to their hardware, software, or electronic data, as well as from the disruption or misdirection of the services they provide.
 - https://en.wikipedia.org/wiki/Computer_security

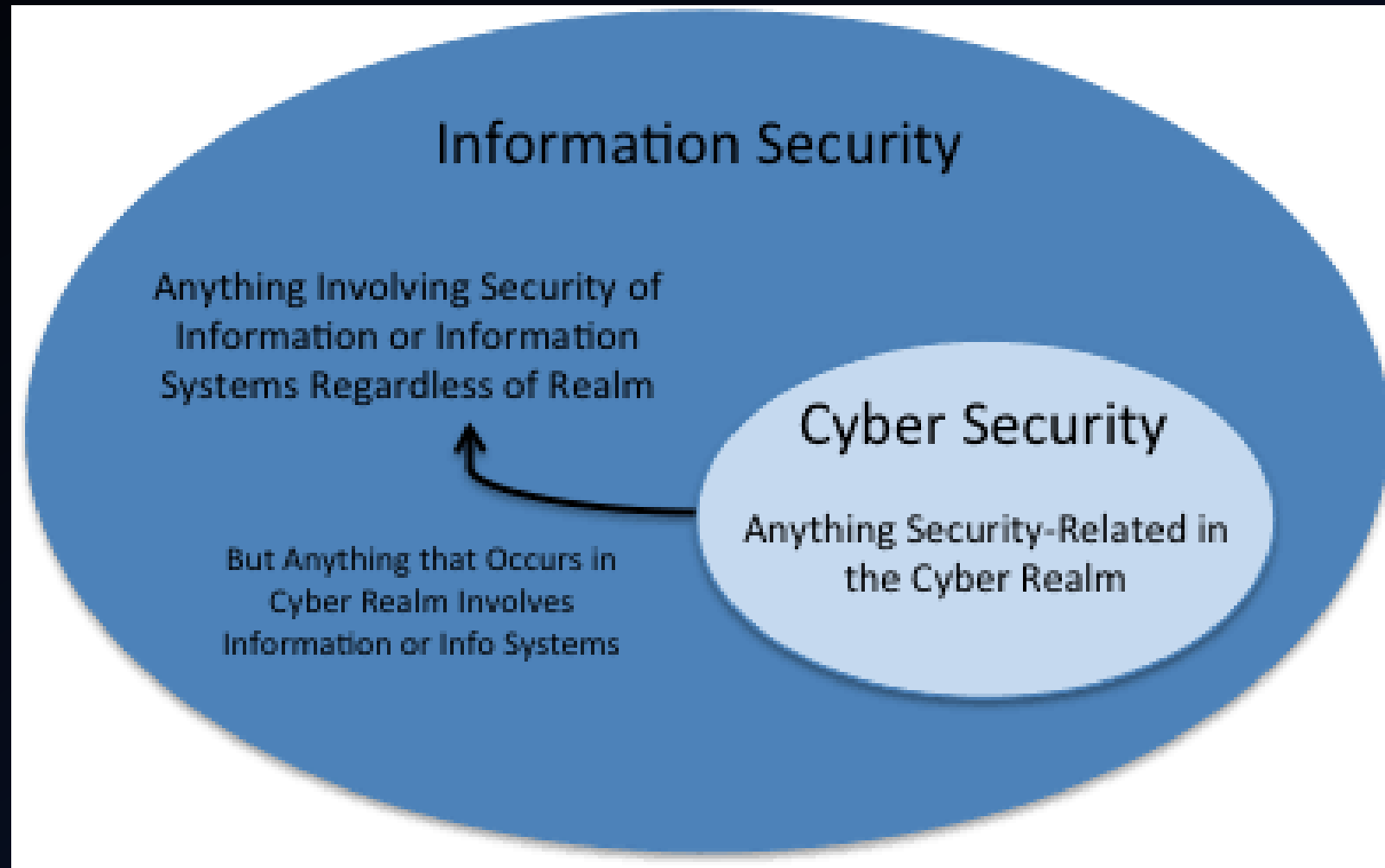
Security Realms

- Information Security
- IT Security
- Cyber Security
- Network Security
- System Security
- Data Security
- Operating System Security
- Physical Security

Information Security

- **Information security**, sometimes shortened to **infosec**, is the 'practice of protecting information' by mitigating information risks.
- It is part of information risk management.
- It typically involves preventing or at least reducing the probability of unauthorized/inappropriate access, use, disclosure, disruption, deletion/destruction, corruption, modification, inspection (monitor), recording or devaluation of data and/or systems.
- Information may take any form, e.g. electronic or physical.

Cyber Security vs InfoSec



CYBER SECURITY VERSUS INFORMATION SECURITY

Cyber security deals with protecting your data and information that is in digital or electronic form.

It protects data that exists in the cyber realm from unauthorized digital access.

It deals with advanced persistent threats that are imminent.

It deals with cyber threats such as phishing, baiting, data breach, etc.

Information security deals with safeguarding your information assets that are in both physical and digital format.

It's all about protecting information and their confidentiality, integrity, and availability.

It's the foundation of data security which means it's the first step.

It deals with all sorts of threats to make sure proper security protocols are in place.

Cyber Security Jobs & Careers

<https://www.cybersecurityeducation.org/careers/>

- Start at any point in your life / career.
- Wide range of responsibilities.
- Crux of the job is to **protect online data and systems** from being compromised.
- Cyber security careers are **complex**.
- Many roles can be found with banks, retailers and government organizations.
- On the job, you can expect to:
 - **safeguard** an organization's files and network
 - install / configure firewalls
 - create security plans
 - monitor activity
 - If a breach occurs, you'll be responsible for **identifying the problem** and **finding a solution** quickly.
- Because of the frequency of cyber attacks, **careers are varied** and **qualified professionals are in demand**.
- If you're ready to get started in this fast-growing career, start exploring cyber careers now.

Job Titles

- Cyber Security Vendor
 - Solution Provider
 - Services
- Security Auditor
- PenTester / Ethical Hacker
- Security Analyst
- InfoSec Engineer
- InfoSec Consultant
- Malware Analyst
- Forensic Analyst/Expert/Investigator
- Incident Handler / Manager
- InfoSec / Cyber Security Specialist
- InfoSec Manager
- CISO

***TOP 10 CYBER SECURITY JOB TITLES**

- Security Engineer
- Security Analyst
- Information Security Analyst
- Information Security Engineer
- Network Security Engineer
- Information Technology Security Analyst
- Information Security Manager
- Information Assurance Engineer
- Senior IT Auditor
- Security Administrator

*UMUC.edu study

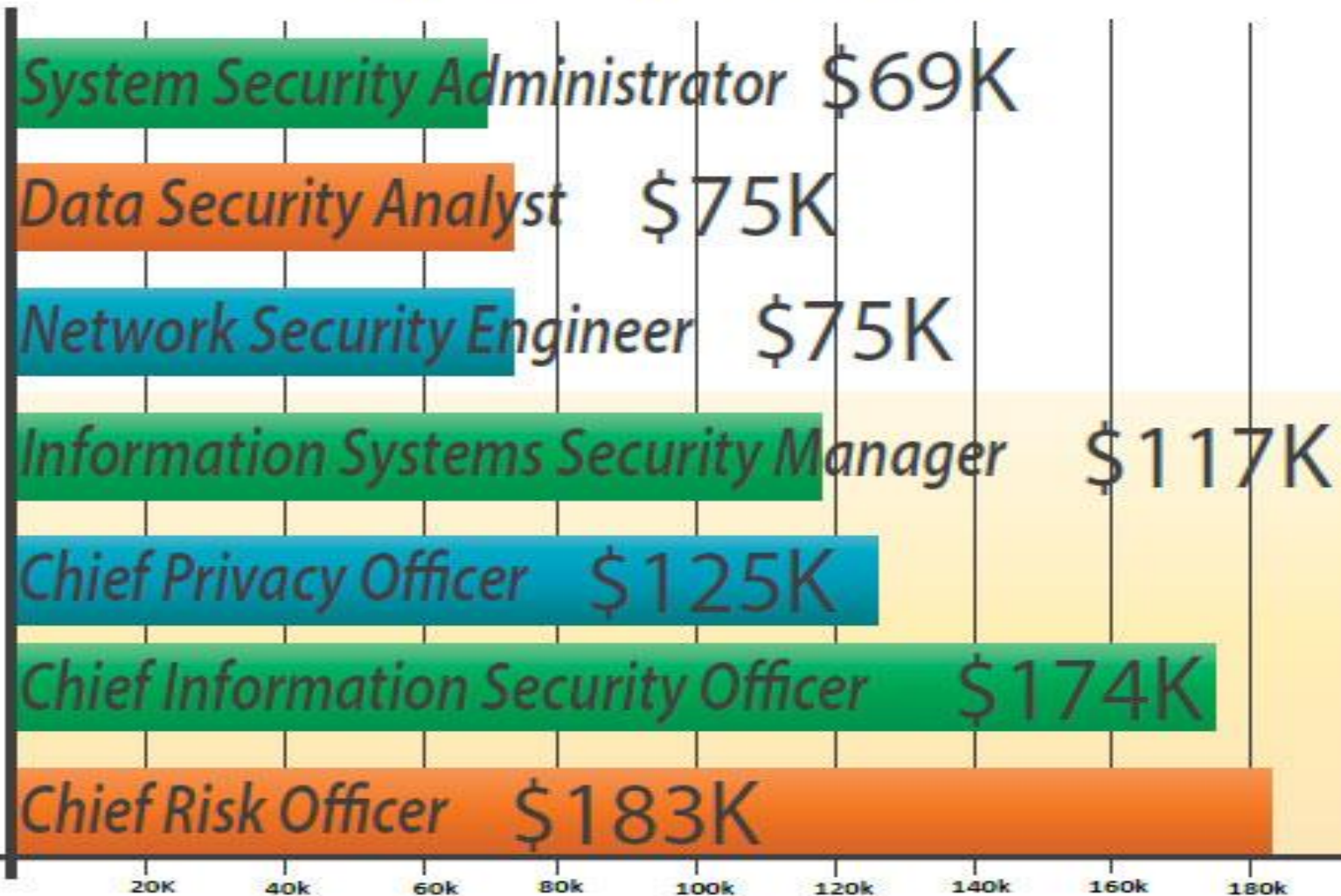
Here are the 10 highest-paying job titles in cybersecurity in the US.

- Application security engineer
- Director of information security
- Senior security consultant
- Cloud engineer
- Software architect
- Penetration tester
- Risk manager
- Chief information officer
- Security engineer
- Information manager

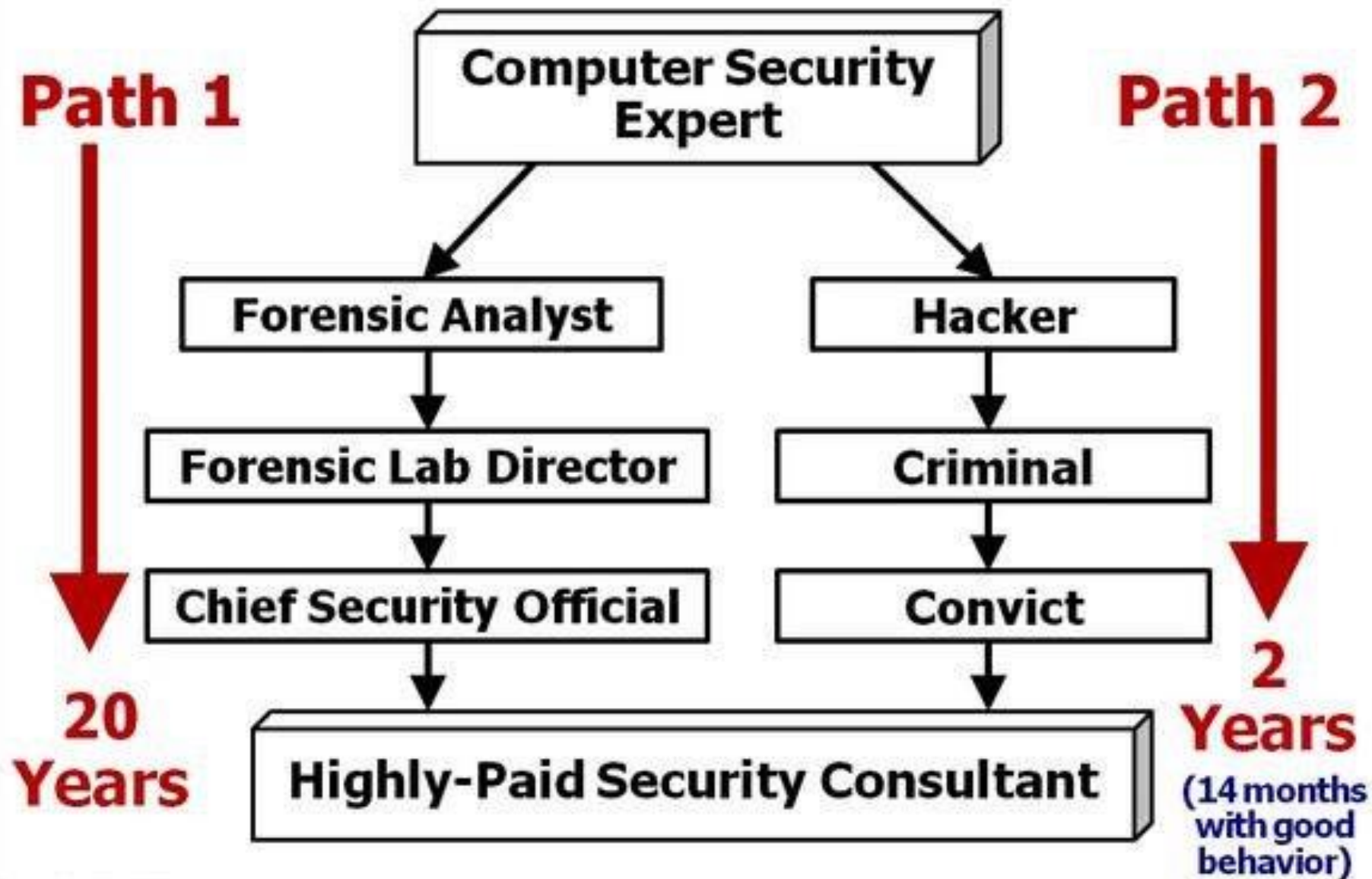


Hot IT Career Choices

MEDIAN ANNUAL WAGES



Computer Security Career Paths



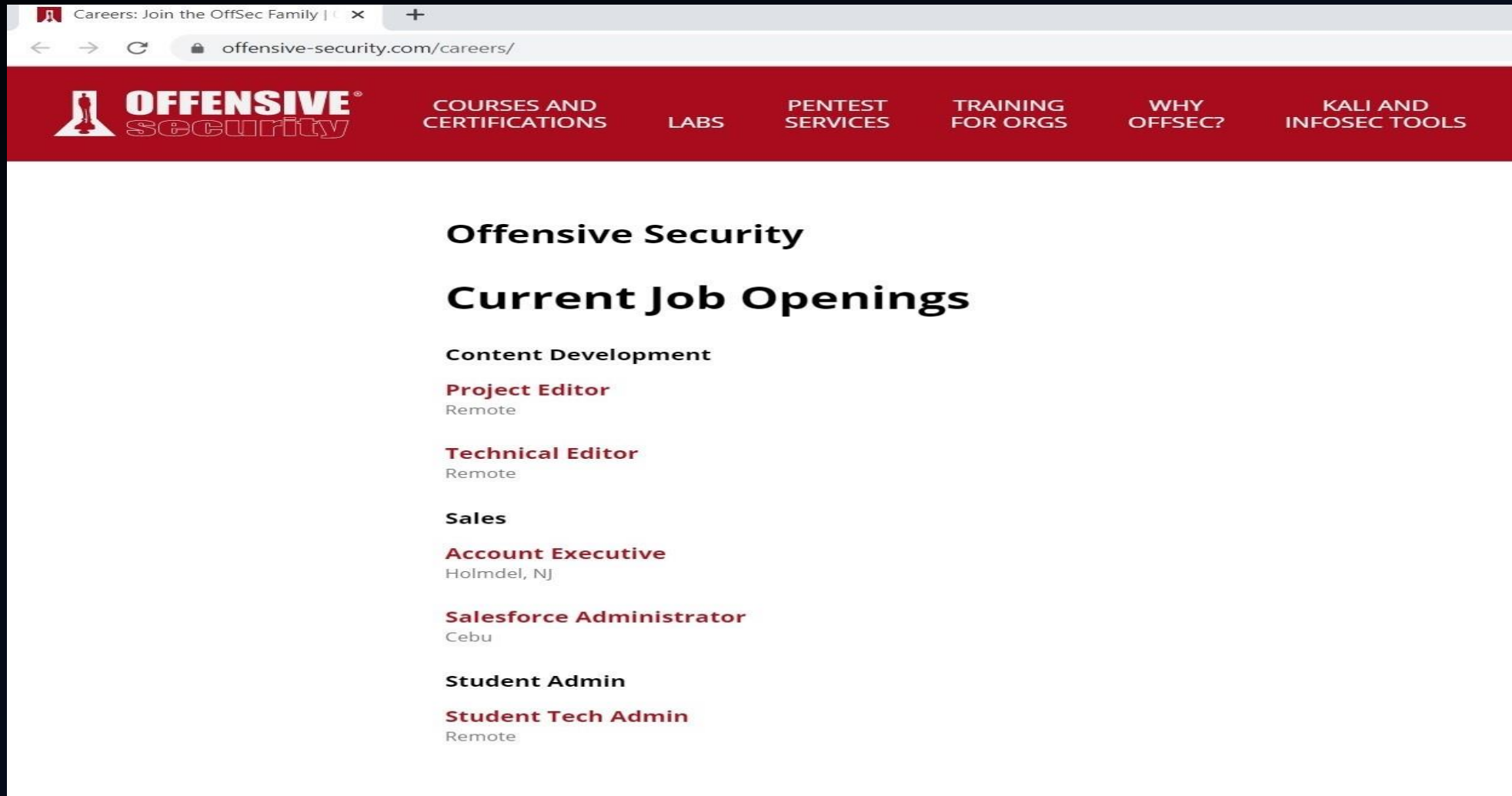
Job Sectors

- Internships
- Education
 - Teaching / Training
 - Universities / Certs
- CERTs
- Private Organizations
- Government Institutes
- Financial Sector
- Law Enforcement & Military
- Freelancing
- Independent Consultant



Offensive Security – Jobs

<https://www.offensive-security.com/careers/>

A screenshot of the Offensive Security careers page. The browser's address bar shows the URL 'offensive-security.com/careers/'. The page has a red header with the Offensive Security logo and navigation links: 'COURSES AND CERTIFICATIONS', 'LABS', 'PENTEST SERVICES', 'TRAINING FOR ORGS', 'WHY OFFSEC?', and 'KALI AND INFOSEC TOOLS'. The main content area is white and features the title 'Offensive Security Current Job Openings'. Below this, there are several job categories listed in bold black text: 'Content Development', 'Sales', and 'Student Admin'. Each category has one or more job titles listed below it in bold red text, with the location or work type in smaller black text. The jobs listed are: 'Project Editor' (Remote), 'Technical Editor' (Remote), 'Account Executive' (Holmdel, NJ), 'Salesforce Administrator' (Cebu), and 'Student Tech Admin' (Remote).

Careers: Join the OffSec Family | X

offensive-security.com/careers/

OFFENSIVE
security

COURSES AND CERTIFICATIONS LABS PENTEST SERVICES TRAINING FOR ORGS WHY OFFSEC? KALI AND INFOSEC TOOLS

Offensive Security

Current Job Openings

Content Development

Project Editor
Remote

Technical Editor
Remote

Sales

Account Executive
Holmdel, NJ

Salesforce Administrator
Cebu

Student Admin

Student Tech Admin
Remote

Offensive Security – Jobs

https://www.flexjobs.com/jobs/telecommuting-jobs-at-offensive_security_services

The screenshot shows a web browser window with the URL [flexjobs.com/jobs/telecommuting-jobs-at-offensive_security_services](https://www.flexjobs.com/jobs/telecommuting-jobs-at-offensive_security_services). The FlexJobs logo is in the top left, and navigation links include Jobs, How FlexJobs Works, Job Search Tips & Blog, and Research Companies. A search bar is on the right. Below the navigation bar, there are icons for Get Started Now, Tour FlexJobs, Advanced Search, Job Categories, View New Jobs, Find Jobs By Location, and Featured Employer Jobs.

Offensive Security Services Jobs with Remote and Flexible Work Options

Headquarters: 📍 New York, New York | [Visit Offensive Security Services's website](#) ➤

[Overview](#)

About Offensive Security Services

As the leading provider of certifications and online penetration testing, Offensive Security Services offers hands-on training, virtual lab access, and performance-based certification programs to information security professionals. Offensive Security Service helps industry experts with career advancement skills by providing industry-defining certifications and testing courses, which include certification options, such as Wireless Professional (OSWP), Certified Expert (OSCE), Certified Professional (OSCP), Exploitation Expert (OSEE), and Web Expert (OSWE).

Offensive Security Services was founded in 2006 by Mati Aharoni, the original creator of Kali Linux, an operating system for ethical hacking, penetration testing, and network security assessments. Offensive Security Services's course overview is available in various delivery methods, which include in-house training, online education, and in-person engagement. It covers a variety of subject matters,

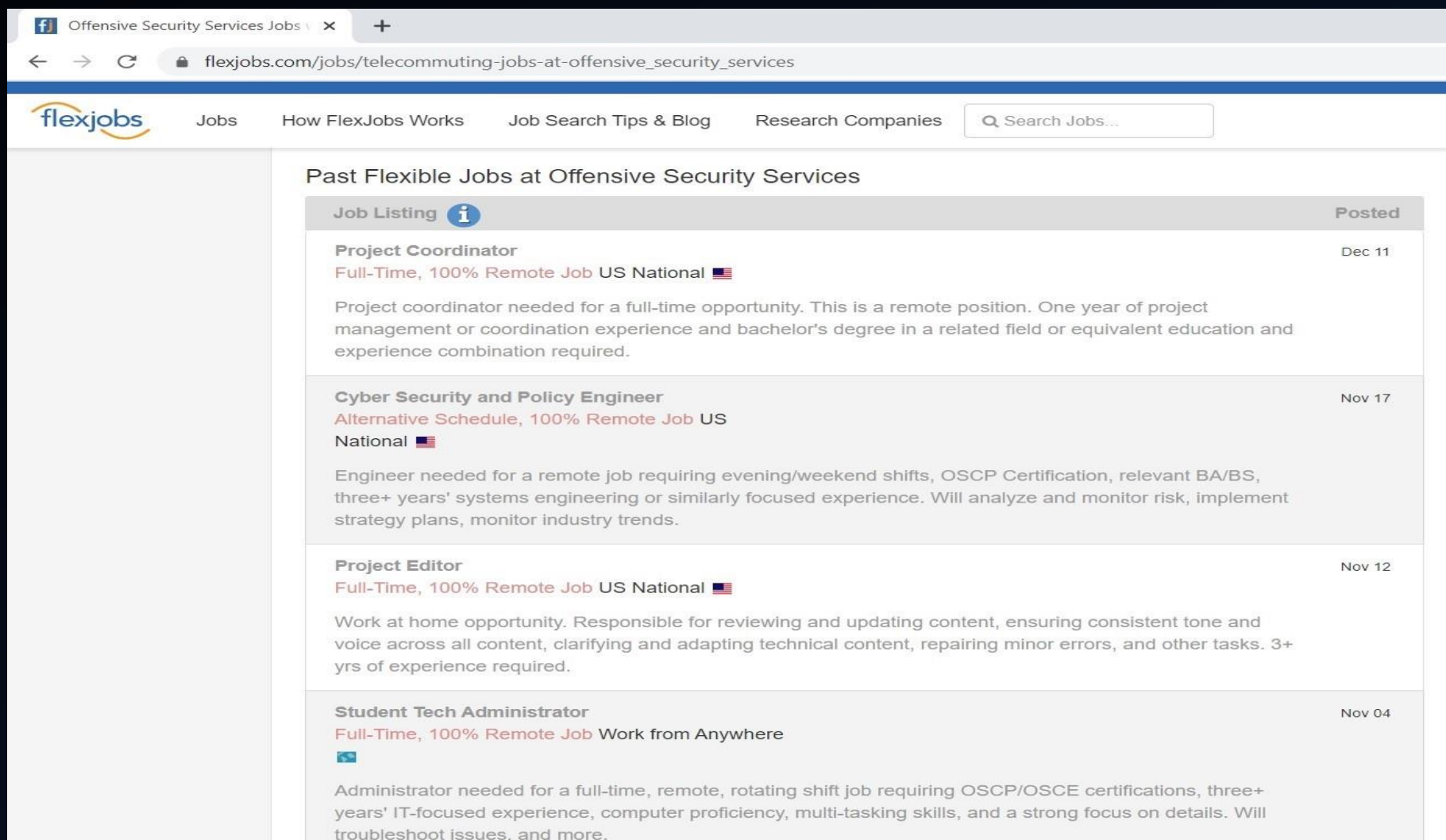
[Read More](#) ▼

Work Flexibility Offered

Full-Time	84%
Part-Time	0%
Remote Work Options	100%
Flexible Schedule	17%
Employee	100%
Freelance	0%

Offensive Security – Jobs

https://www.flexjobs.com/jobs/telecommuting-jobs-at-offensive_security_services



The screenshot shows a web browser window with the FlexJobs website. The address bar displays the URL: [flexjobs.com/jobs/telecommuting-jobs-at-offensive_security_services](https://www.flexjobs.com/jobs/telecommuting-jobs-at-offensive_security_services). The website header includes the FlexJobs logo and navigation links: Jobs, How FlexJobs Works, Job Search Tips & Blog, and Research Companies. A search bar is also present.

The main content area is titled "Past Flexible Jobs at Offensive Security Services". It features a table with job listings. The table has two columns: "Job Listing" and "Posted".

Job Listing	Posted
Project Coordinator Full-Time, 100% Remote Job US National 🇺🇸 Project coordinator needed for a full-time opportunity. This is a remote position. One year of project management or coordination experience and bachelor's degree in a related field or equivalent education and experience combination required.	Dec 11
Cyber Security and Policy Engineer Alternative Schedule, 100% Remote Job US National 🇺🇸 Engineer needed for a remote job requiring evening/weekend shifts, OSCP Certification, relevant BA/BS, three+ years' systems engineering or similarly focused experience. Will analyze and monitor risk, implement strategy plans, monitor industry trends.	Nov 17
Project Editor Full-Time, 100% Remote Job US National 🇺🇸 Work at home opportunity. Responsible for reviewing and updating content, ensuring consistent tone and voice across all content, clarifying and adapting technical content, repairing minor errors, and other tasks. 3+ yrs of experience required.	Nov 12
Student Tech Administrator Full-Time, 100% Remote Job Work from Anywhere 🌐 Administrator needed for a full-time, remote, rotating shift job requiring OSCP/OSCE certifications, three+ years' IT-focused experience, computer proficiency, multi-tasking skills, and a strong focus on details. Will troubleshoot issues, and more.	Nov 04

Offensive Security – Jobs

<https://www.indeed.com/q-Offensive-Security-jobs.html>

Offensive Security Jobs, Employment x +

indeed.com/q-Offensive-Security-jobs.html

Salary Estimate

- \$45,000+ (1003)
- \$50,000+ (503)
- \$55,000+ (483)
- \$70,000+ (408)
- \$95,200+ (223)

Job Type

- Full-time (1138)
- Part-time (571)
- Temporary (10)
- Contract (9)
- Internship (9)
- Commission (2)

Location

- New York, NY (39)
- Portland, OR (32)
- Washington, DC (27)
- Vancouver, WA (20)
- Salem, OR (17)
- + more »

Company

- U.S. Army (528)
- US Department of the Int... (37)
- United Nations (29)
- Raytheon (28)
- Booz Allen Hamilton (18)
- + more »

Experience Level

Offensive Security Pentest Manager
Facebook 4.2 ★
Menlo Park, CA

- OFFENSIVE SECURITY PENTEST MANAGER RESPONSIBILITIES.
- Facebook's Security team is looking for an Offensive Security Pentest Manager that can deliver technical...

13 days ago · Save job · more...

Offensive Hardware Security Researcher
NVIDIA 4.2 ★
Santa Clara, CA

- Demonstrated experience offensive security research (CVE's, publications, tools) and responsible disclosure.
- As a member of our Security Architecture team, you...

30+ days ago · Save job · more...

2020 Cyber Security Internship
Major League Baseball 4.3 ★
New York, NY 10167 (Midtown area)

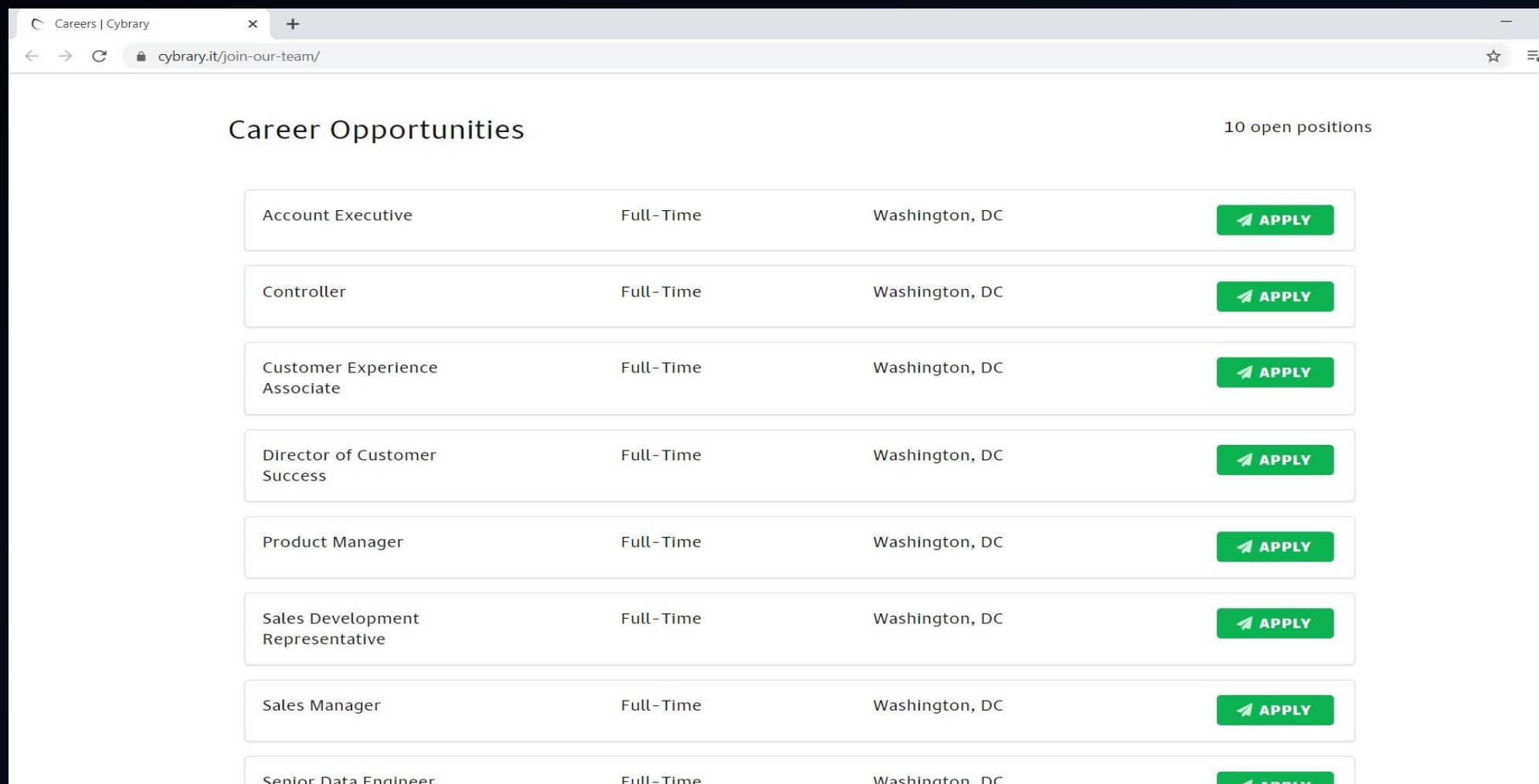
- Relevant certifications such as COMPTIA Security+, Offensive Security OSCP, SANS are a plus.
- Support efforts to improve security posture throughout the MLB...

30+ days ago · Save job · more...

Secure Design Cloud, Security Reviewer
Apple 4.2 ★
Santa Clara Valley, CA 95014

CYBRARY Career Opportunities

<https://www.cybrary.it/join-our-team/>

A screenshot of a web browser showing the 'Careers | Cybrary' page. The browser's address bar displays 'cybrary.it/join-our-team/'. The page title is 'Career Opportunities' with a sub-header '10 open positions'. Below this, a table lists seven job openings. Each row contains the job title, employment type (all are 'Full-Time'), location (all are 'Washington, DC'), and a green 'APPLY' button with a right-pointing arrow.

Career Opportunities			10 open positions
Account Executive	Full-Time	Washington, DC	APPLY
Controller	Full-Time	Washington, DC	APPLY
Customer Experience Associate	Full-Time	Washington, DC	APPLY
Director of Customer Success	Full-Time	Washington, DC	APPLY
Product Manager	Full-Time	Washington, DC	APPLY
Sales Development Representative	Full-Time	Washington, DC	APPLY
Sales Manager	Full-Time	Washington, DC	APPLY
Senior Data Engineer	Full-Time	Washington, DC	APPLY

CYBRARY Career Opportunities

<https://www.cybrary.it/contribute/>



CYBRARY Career Opportunities

<https://www.cybrary.it/contribute/>

Contribute - Cybrary | Cybrary

cybrary.it/contribute/

Become a **Top Contributor** in the Cybrary Community

The Cybrary Community is an integral part of our organization. Our platform is filled with instructors, industry professionals, mentors, published authors, and much more. By becoming part of the community, you not only have access to these resources, but can also learn and contribute to become the next leader in the industry. Become part of the team today!



Why become a Cybrary Instructor?

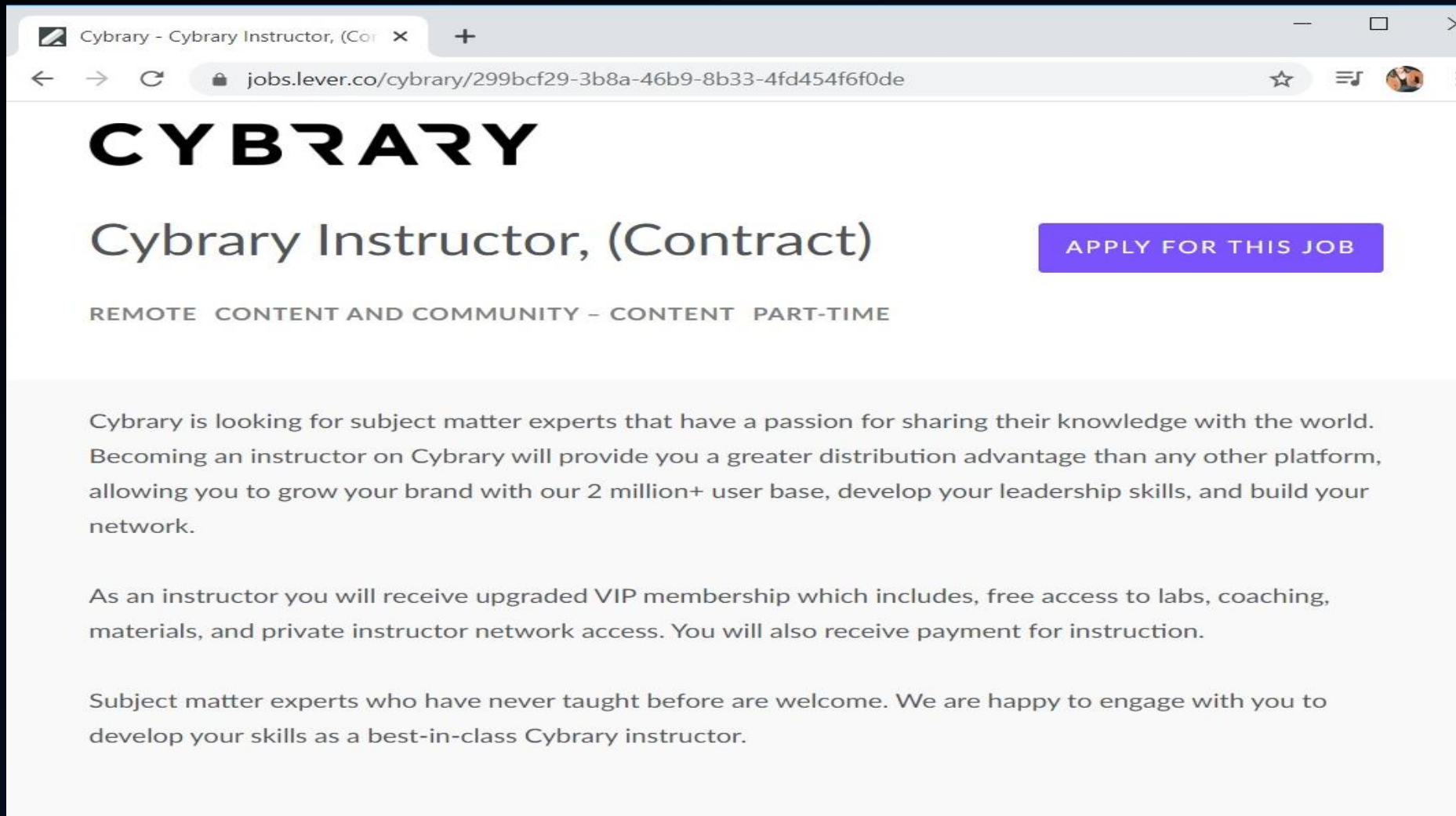
- **Build** your personal brand: Become a leader in your field, join an ever-growing community of industry leaders who influence the global industry.
- **Gain** recognition in the industry: Our community has over 2.5 million active learners from all backgrounds and career levels. Quality courses attract future talent to your organization as well as showcase your experience and skills for future lucrative opportunities.
- **Give back** to the community: By training the next generation of professionals, you will contribute to solutions to the talent gap in our global community. Your courses help empower students and career professionals alike to gain sought after skills to start their careers. Many of whom would not have access to this education through legacy education programs.

APPLY TO BECOME A CYBRARY INSTRUCTOR

LEARN MORE ABOUT CYBRARY INSTRUCTORS

CYBRARY Instructor

<https://jobs.lever.co/cybrary/299bcf29-3b8a-46b9-8b33-4fd454f6f0de>



The screenshot shows a web browser window with the URL jobs.lever.co/cybrary/299bcf29-3b8a-46b9-8b33-4fd454f6f0de. The page features the Cybrary logo at the top, followed by the job title "Cybrary Instructor, (Contract)" and a purple "APPLY FOR THIS JOB" button. Below the title, the job details "REMOTE", "CONTENT AND COMMUNITY - CONTENT", and "PART-TIME" are listed. The main body of the page contains three paragraphs of text describing the role and benefits.

CYBRARY

Cybrary Instructor, (Contract)

APPLY FOR THIS JOB

REMOTE CONTENT AND COMMUNITY - CONTENT PART-TIME

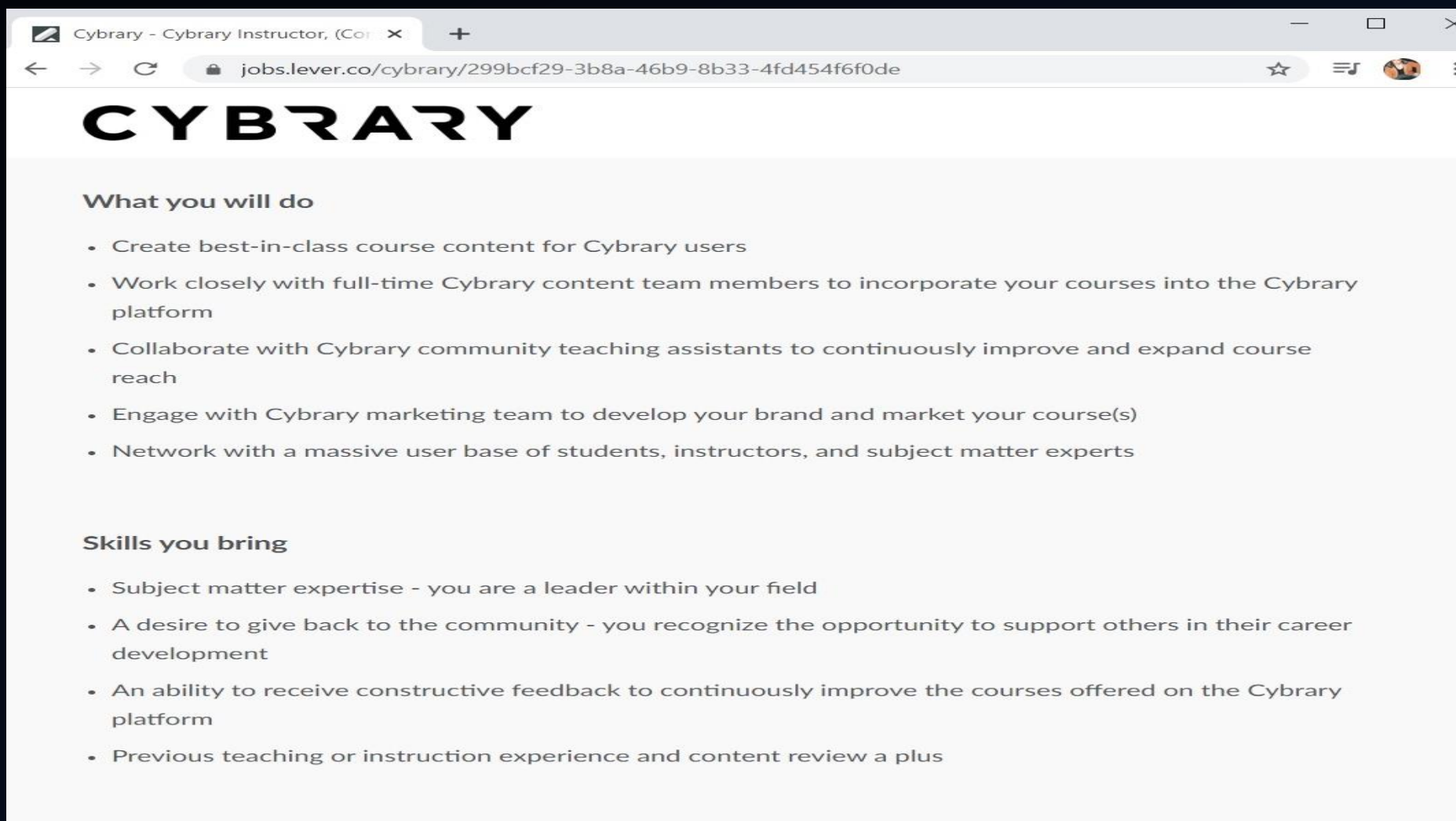
Cybrary is looking for subject matter experts that have a passion for sharing their knowledge with the world. Becoming an instructor on Cybrary will provide you a greater distribution advantage than any other platform, allowing you to grow your brand with our 2 million+ user base, develop your leadership skills, and build your network.

As an instructor you will receive upgraded VIP membership which includes, free access to labs, coaching, materials, and private instructor network access. You will also receive payment for instruction.

Subject matter experts who have never taught before are welcome. We are happy to engage with you to develop your skills as a best-in-class Cybrary instructor.

CYBRARY Instructor

<https://jobs.lever.co/cybrary/299bcf29-3b8a-46b9-8b33-4fd454f6f0de>



The screenshot shows a web browser window with the address bar displaying the URL jobs.lever.co/cybrary/299bcf29-3b8a-46b9-8b33-4fd454f6f0de. The page title is "Cybrary - Cybrary Instructor, (Co...". The main heading is "CYBRARY" in a large, bold, black font. Below the heading, there are two sections: "What you will do" and "Skills you bring", each followed by a bulleted list of requirements.

CYBRARY

What you will do

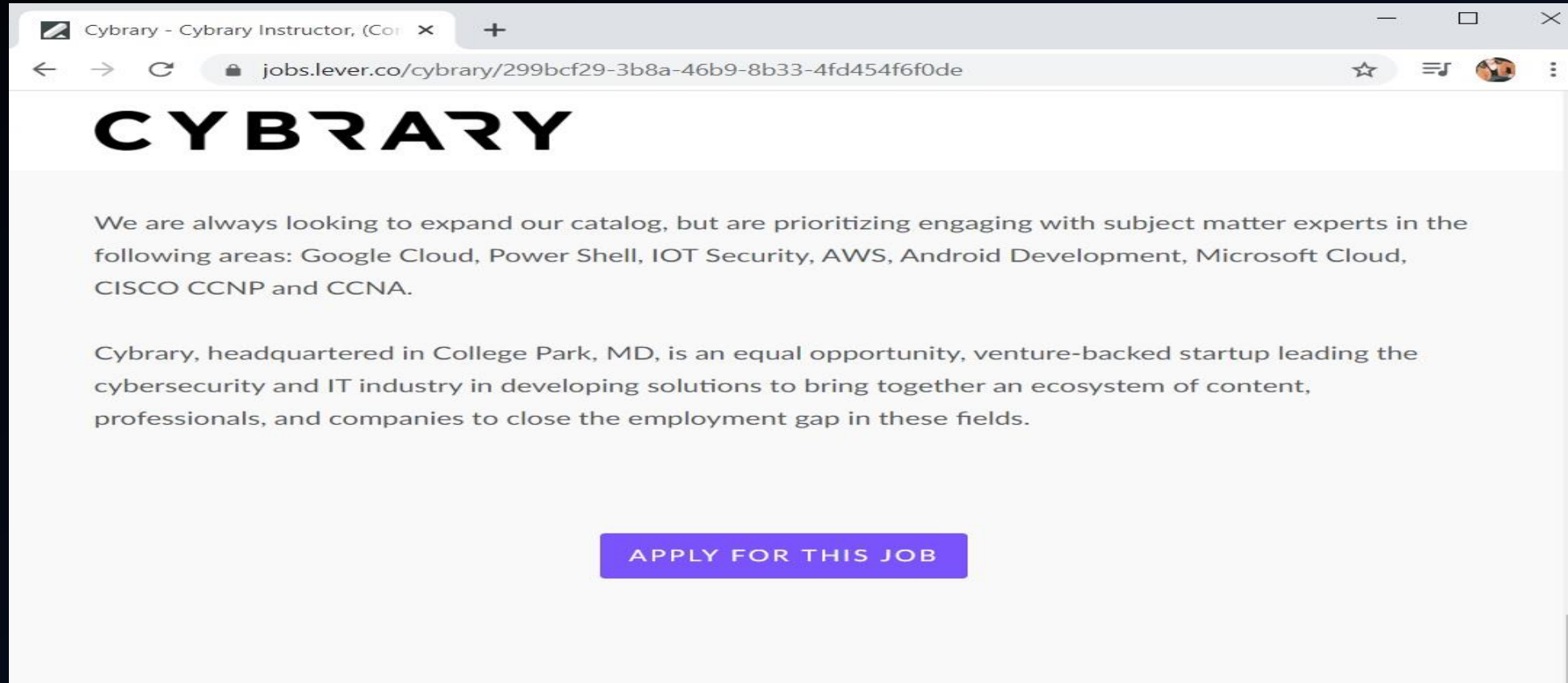
- Create best-in-class course content for Cybrary users
- Work closely with full-time Cybrary content team members to incorporate your courses into the Cybrary platform
- Collaborate with Cybrary community teaching assistants to continuously improve and expand course reach
- Engage with Cybrary marketing team to develop your brand and market your course(s)
- Network with a massive user base of students, instructors, and subject matter experts

Skills you bring

- Subject matter expertise - you are a leader within your field
- A desire to give back to the community - you recognize the opportunity to support others in their career development
- An ability to receive constructive feedback to continuously improve the courses offered on the Cybrary platform
- Previous teaching or instruction experience and content review a plus

CYBRARY Instructor

<https://jobs.lever.co/cybrary/299bcf29-3b8a-46b9-8b33-4fd454f6f0de>



The screenshot shows a web browser window with the following elements:

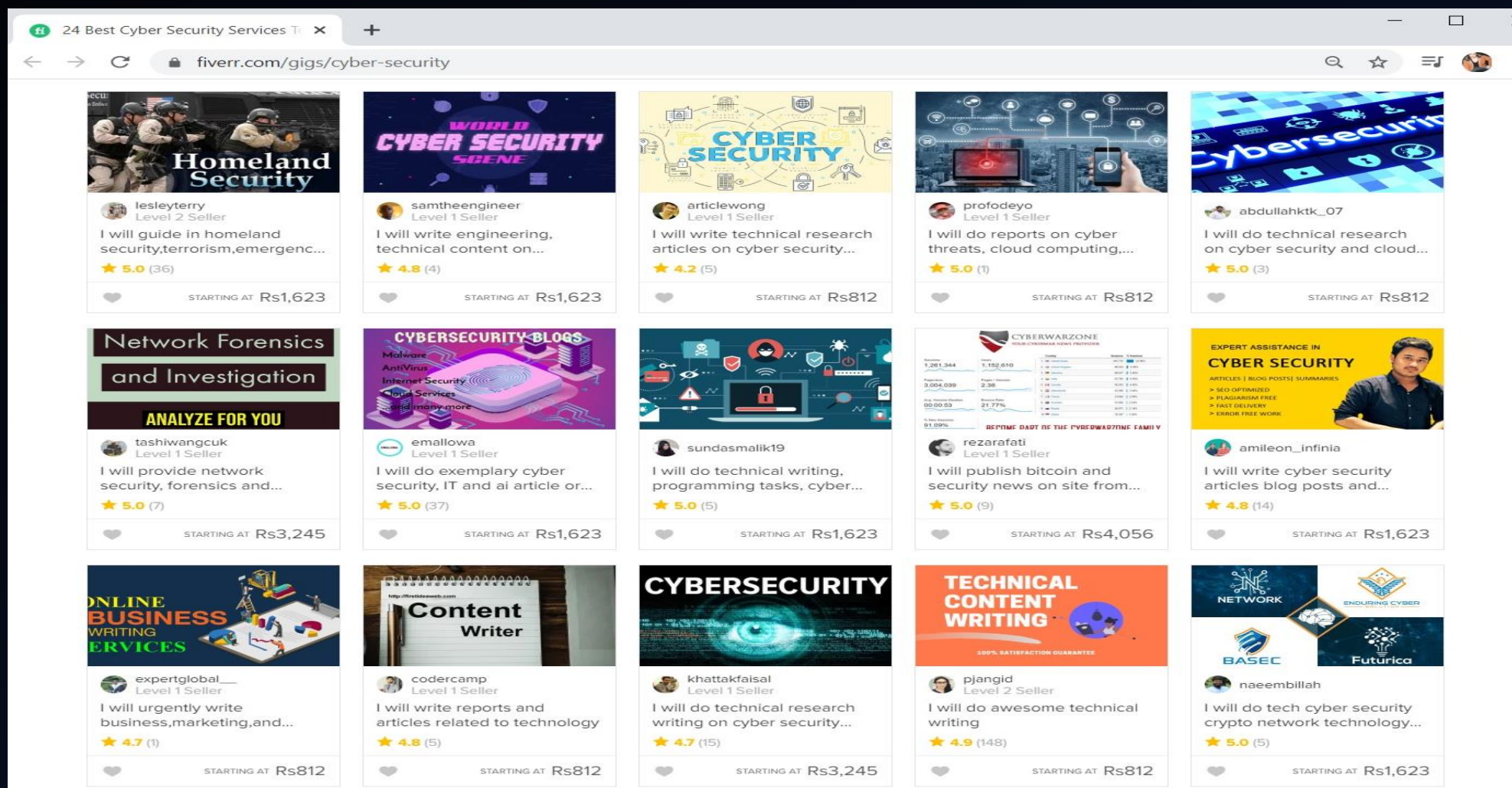
- Browser Tab:** Cybrary - Cybrary Instructor, (Co
- Address Bar:** jobs.lever.co/cybrary/299bcf29-3b8a-46b9-8b33-4fd454f6f0de
- Logo:** CYBRARY
- Text:**

We are always looking to expand our catalog, but are prioritizing engaging with subject matter experts in the following areas: Google Cloud, Power Shell, IOT Security, AWS, Android Development, Microsoft Cloud, CISCO CCNP and CCNA.

Cybrary, headquartered in College Park, MD, is an equal opportunity, venture-backed startup leading the cybersecurity and IT industry in developing solutions to bring together an ecosystem of content, professionals, and companies to close the employment gap in these fields.
- Button:** APPLY FOR THIS JOB

<https://www.fiverr.com/gigs/cyber-security>

<https://www.fiverr.com/gigs/cyber-security>



Online Job Application / Search Sources

- Job Websites / Online Career Portals
- Social Media
 - Facebook
 - LinkedIn
- Company Websites
- InfoSec Organization's career portals

Other Ways

- Search for company contact, submit CV's, turn up in-person.
- Word of mouth
 - Increase your social circle
- Attend InfoSec/IT related meetups, seminars, workshops & conferences.

Where the cybersecurity jobs are

Metros with the most job postings for cybersecurity roles

Rank	Metro area	Rank	Metro area
1	Washington, DC	6	Atlanta, GA
2	New York, NY	7	Boston, MA
3	Dallas-Fort Worth, TX	8	San Francisco, CA
4	Baltimore, MD	9	Los Angeles, CA
5	Chicago, IL	10	San Jose, CA

Source: Indeed



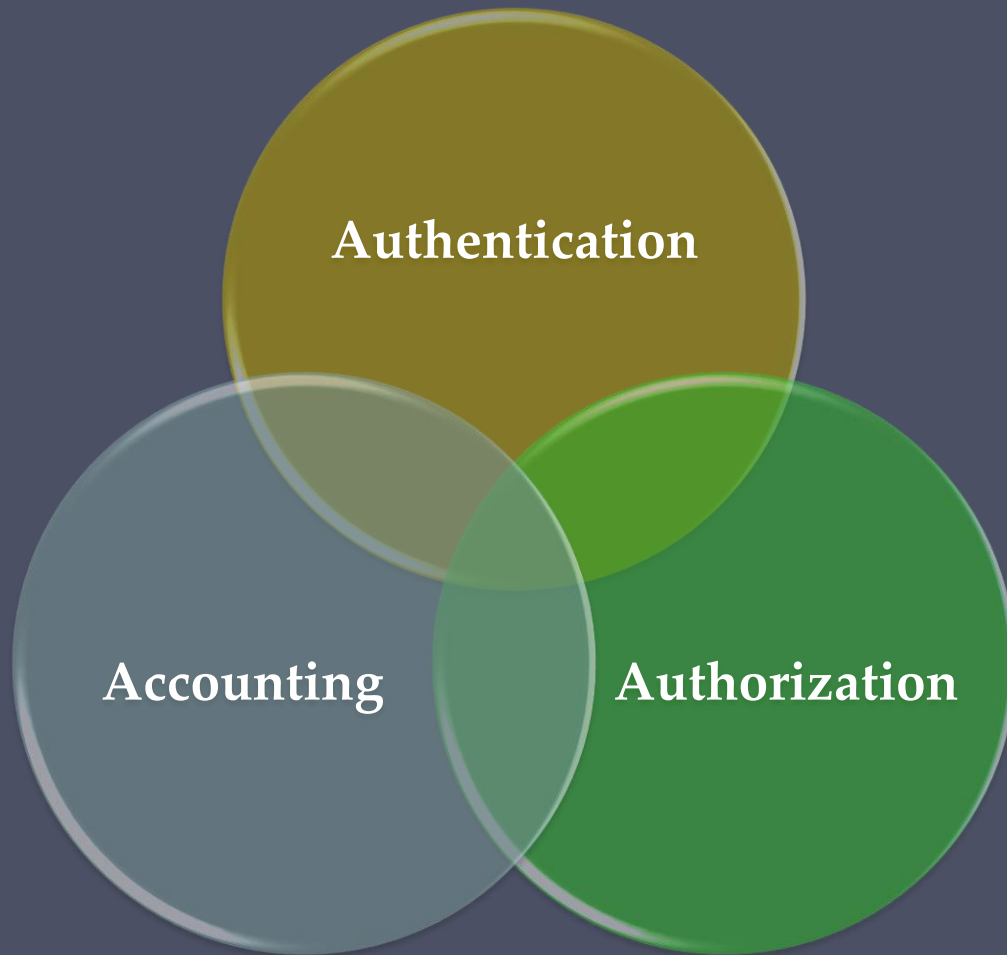
Pre-requisites / Previous Knowledge

- Hardware
 - PC, Server, DC
 - Network Devices: Router, Switch, Load Balancer
- Operating Systems
 - Microsoft Windows, Apple Mac, Unix, Linux
- Networking
 - OSI, TCP/IP, Ports, Protocols, Devices
- Virtualization / Cloud Computing
- Programming / Scripting

A person's hands are holding a tablet. The screen displays a futuristic, glowing blue interface. At the top, the text "ACCESS GRANTED" is written in a bold, glowing blue font. Below the text, there is a large, glowing blue padlock icon that is open. To the left of the padlock, there are several smaller, glowing blue padlock icons. To the right of the padlock, there is a circular gauge or donut chart with four segments, each labeled with a percentage: 20%, 15%, 35%, and 50%. The background of the interface is dark blue with glowing circuit lines and data points. The person holding the tablet is wearing a dark jacket and a watch on their left wrist.

ACCESS GRANTED

User Authentication and Access Control



Authentication, Authorization, and Accounting (AAA)