



## NCSIP Position Paper

# Cyber Education for Post-Secondary Institutions

Prepared on behalf of NCSIP with input from Committee Members

2019-01-18

---

## Introduction

The demand for cybersecurity experts far exceeds the supply around the world. The talent shortage globally is forecasted to be 3.5 million by 2021. Half of these vacancies are expected to be in North America. In Canada, 26% of companies do not have anybody responsible for cybersecurity, and as employers start recognising the need for cybersecurity personnel in their organizations, they are struggling to find qualified and skilled cyber professionals ([Global News, Dec 5, 2018](#)).

According to the [\(ISC\)<sup>2</sup> 2018 Cybersecurity Workforce Study](#), 63% of organizations report they do not have enough cybersecurity staff. Data from [cyberseek.org](#) shows that in the US alone there are currently over three hundred thousand cybersecurity job openings. More conservative findings from Deloitte estimate a cyber skill shortage of 1.8 million worldwide by 2022. From 2016 till 2021 organizations in Canada need to fill over 8000 positions in cybersecurity ([Closing the Cyber Risk Gap, Deloitte](#)).

## Post-Secondary Education in Cybersecurity

A growing number of jurisdictions and countries include cybersecurity education into curriculum as early as kindergarten. Raising cyber-aware adults is becoming a priority for governments, educators and policy makers ([Closing the Cyber Risk Gap, Deloitte](#)). Recognizing the demand for cyber talent, post secondary educational institutions develop new courses and programs focused on cybersecurity. In 2015, a Canadian cybersecurity network SERENE-RISC published a [directory](#) of cybersecurity courses offered at about 60 universities and colleges in the country. New programs and courses have been created since then, but it is a starting place highlighting post secondary education offerings in cyber.

In the US one of the initiatives to expand the cybersecurity education and develop the workforce is launched by the National Institute of Standards and Technology (NIST) – the National Initiative for Cybersecurity Education ([NICE](#)). It provides various resources and tools “to energize and promote a robust network and an ecosystem of cybersecurity education, training, and workforce development”, as their mission statement shows ([Strategic Plan, NICE](#)). And while cybersecurity education is still primarily obtained through a set of courses and certificate programs, there are also graduate degrees with cybersecurity focus (e.g., [Master’s in Information Systems Security](#) at Concordia University, [Cybersecurity Graduate Certificate](#) at Centennial College). While there are undergraduate degrees in cybersecurity available in the United States, there is no equivalent presently in Canada. **It is the position of NCSIP that a four year degree in cybersecurity should be strongly considered while evaluating whether the other diploma and certificate**



programs are able to meet the needs.

## Cybersecurity Careers

There are a variety of roles and profiles available in cybersecurity career track – from technical and entry-level cybersecurity technicians to advanced level business and the strategy-focused chief information security officer. There is no shortage of information on different jobs in the field of cybersecurity, a quick search online reveals titles like *security analyst*, *security architect*, *cybersecurity engineer*, *cryptoanalyst*, *security software developer*, *cybersecurity consultant* – just to name a few. Cybersecurity careers are challenging, rewarding, and there is no other industry where professionals are so willing to help out those new to the field.

The opportunities in cybersecurity appeal to a wide range of interests and preferences. Those who prefer to work with tools and systems on an operational level may focus on positions in system administration, threat analysis, penetration testing, incident response, cyber investigations and forensics, for example. And individuals who enjoy working in less tactical roles can find their calling, for example, in security awareness, education and training, building governance frameworks, developing policies and standards, managing compliance and risk, assessing and advising on security solutions. All of these jobs are well-paying jobs, starting at around \$60K for entry-level up to \$250K or more for advanced level positions.

In their report [Closing the Cyber Risk Gap](#) Deloitte created *Personas* based model for cyber talent. This document is recommended reading in the area of cybersecurity talent development. The seven *Personas* identified are *Strategist*, *Advisor*, *Defender*, *Firefighter*, *Hacker*, *Scientist*, and *Sleuth*. According to the report, the hardest to find today are the *Strategist* and *Scientist* roles, and they are expected to grow the fastest in importance together with the *Advisor* persona.

The cyber talent shortage represents a significant challenge for employers and a significant opportunity for students and young professionals looking for a challenging and rewarding career. NCSIP recommends governments across federal, provincial, and territories get more involved and ensure students have an opportunity to be educated in the rapid growth area of cybersecurity.

### RESOURCES:

(ISC)<sup>2</sup> Cybersecurity Workforce Study, 2018 - <https://www.isc2.org/-/media/ISC2/Research/2018-ISC2-Cybersecurity-Workforce-Study.ashx?la=en&hash=4E09681D0FB51698D9BA6BF13EEABFA48BD17DB0>

The Changing Faces of Cybersecurity: Closing the Cyber Risk Gap, Deloitte - <https://www2.deloitte.com/content/dam/Deloitte/ca/Documents/risk/ca-cyber-talent-campaign-report-pov-aoda-en.PDF>

Cybersecurity Supply/Demand Heatmap, Cyberseek - <https://www.cyberseek.org/heatmap.html> (US data only)



Canadian Cybersecurity Course Directory, SERENE-RISC - [https://www.serene-risc.ca/files/prod/downloads/1/Course-Directory\\_v2.pdf](https://www.serene-risc.ca/files/prod/downloads/1/Course-Directory_v2.pdf)

Cybersecurity jobs expected to be in high demand in Canada, experts say, Global News, Dec 5, 2018 - <https://globalnews.ca/news/4733898/cybersecurity-jobs-high-demand-canada/>

National Initiative for Cybersecurity Education, NIST - <https://www.nist.gov/itl/applied-cybersecurity/nice>