

GUIDELINES FOR INTERNATIONALLY TRAINED ENGINEERS

Index:

I. Introduction	2
II. Licensing Authority.....	2
III. Types of License.....	2
IV. Before coming to Canada	3
V. Application Process.....	3
VI. Engineering Team Titles.....	5
VII. Support programs Engineering.....	5
VIII. Bridging Programs.....	6
IX. Mentorships.....	7
X. Internships.....	8
XI. Useful Links.....	8
XII. Alternative Careers for Engineers in the Category of.....	9
Technologist and Technicians	
XIII. Information Technology (IT) Careers - An Overview.....	17
XIV. References.....	23
XV. Appendix I.....	24

I. Introduction

This document provides the general information's for obtaining the engineering license in Ontario for internationally educated and experienced engineers. Brief overviews of different job opportunities of internationally educated technicians have also been discussed in this document.

To become a Professional Engineer (P. Eng.), Ontario

Following are the five criteria that must be satisfied:

- i. **Education:** An engineering degree from an Engineers Canada Accreditation Board (ECAB), or possess equivalent qualifications [1].
- ii. **Experience:** Accomplish the engineering work experience requirement, where you are applying for a license.
- iii. **Law and Ethics:** Successfully pass the Professional Practice Examination (PPE), which tests the overall knowledge of the laws of the engineering profession which is related to the professional standards to which you will be held responsible with the ethical standards and other topics such as patents, trademarks and copyrights. [1].
- iv. **Good Character:** Applicants must demonstrate good character.
- v. **Language:** Applicants must demonstrate an ability to work in either English or French, depending on the province or territory in which they apply for licensure. [1].

II. Licensing Authority

Professional Engineers Ontario (PEO) is the licensing authority and after fulfilling all the requirements from PEO an Engineers in Ontario use P.Eng. after their names

III. Types of License

Following are the five different types of engineering license [1].

1. Professional Engineer (P. Eng.)

- Needs 4 years' experience including 12 months in Canadian jurisdiction licensing guide

2. Provisional License

- Fulfill requirements other than experience in Canada

3. Temporary License

- For up to 12 months
- 3year overseas +1-year Canadian experience
- Or 10 years engineering overseas experience

4. Limited License

- 13 years of specialized work experience

5. Limited License for faculty members

- 13 years of specialized experience with 2-years teaching experience.

IV. Before Coming to Canada

1. You can apply to PEO licensing process from your country of origin.

You will need:

- Notarized transcripts
- Detailed course descriptions
- Experience record
- Licensing fee

2. PEO will then respond about whether you can get license, how long license will take and if you have to do any exams. The assessment takes approx. 2 months [2].

V. Application Process

Step 1: Apply for License

IEG (International Engineering Graduates) with a Bachelors' Degree or Applied Sciences Degree may be able to apply for license, without cost under Engineering Intern Financial credit program [3].

Step 2: Assessment of Academic Qualifications

If qualifications are not accepted by PEO, PEO may assign technical examination

Note: there may be a special option to have technical exams written abroad – get details from PEO [4]. There may be up to 18 exams to be completed in eight years.

Step 3: PPE (Professional Practice Examination) [5]

- Offered 3 times a year
- Has to be completed within 2 years when you become eligible to write it
- Two parts of exam,
 - Part A: Professional Practice and Ethics
 - Part B: Engineering Law and Professional Liability
- If you are unsuccessful in your exam you can still rewrite it

Step 4: Practical Experience

- 4 years total and of this at least 12 months of Canadian experience
- You can get one year of credit for postgraduate training in engineering

Step 5 – Language proficiency assessment

An acceptable level of English—both written and spoken—is required to practice engineering and to successfully complete PEO exams [4].

VI. Engineering Team Titles

There are different categories that an Engineer/Technologist can hold designations as per qualifications and experience as describe in Table 1.

Table 1: Engineers designations list in Ontario

Engineer	Engineering Technologist	Engineering Technician	Technician
University Degree 3-5-year program	College Diploma 3-year Program	College Diploma 2-year Program	High School Diploma
Work experience 4 years minimum	Work experience 2 years minimum	Work experience 2 years minimum	Completion of Apprenticeship program 2 -5 years
www.peo.on.ca	www.oacett.org	www.oacett.org	www.collegeoftrades.ca

VII. Support Programs Engineering

1. Skills for change

Following are the few categories of support programs for engineers:

5-week program for enhanced language training

2. Specialized language training

Specialized language training is offered by ministry at different locations.

- The Specialized Language Training Pilot Projects [6] offer all type of immigrants with special opportunity to reinforce their language skills, so they can get jobs within their specified filed that reflect their qualifications and involved efficiently with their current profession. Sixteen school boards across Ontario are offering this job-specific language training in one of two ways

- i. Language Training for the Workplace (LTFW) assists immigrants in finding work in a specific field, by offering sector-specific English as a Second Language (ESL) / French as Second Language (FSL) training.
- ii. Language Training in the Workplace (LTIW) helps immigrants who are already employed to improve their ESL/FSL language skills at work.

3. Occupation specific language training

For occupation specific language Humber College, Toronto is holding an eight-week class especially for interview preparation, networking and communication skills [7].

4. Workplace communication skills for technology

This is the unique program offered by Workplace Communication Skills for Technology [8] for the professional who have an experience in architectural, engineering or information technology. The main requirements are (i) English is at an intermediate level (Canadian Language Benchmarks 6 to 8) and (ii) you are a permanent resident of Canada or protected person.

VIII. Bridging Programs

Following are some useful links for the Bridging Programs in Ontario:

1. Ontario Society for professional Engineers (OSPE)

A thirty-three-hour program offered by OSPE for engineers, mainly focus on Canadian workplace culture and the legal and ethical practices pertinent to engineers in Ontario [9].

2. Engineering software skills enhancement

- Part time program consist of two semesters, focused on technical and software skills in the field of mechanical, civil and electrical engineering [10].

1. Internationally educated Engineers qualification bridging program (IEEQB):

- Focused on academic bridging career to obtain license in Ontario [11].

2. Licensing international Engineers into the profession (LIEP)

University of Toronto offered a Licensing International Engineers into the Profession (LIEP) which is a unique program for engineering professional. All the courses are offered at the University of Toronto in lieu of PEO's Confirmatory Examination Program [12].

3. Professional access and integration enhancement program

Professional Access into Employment (PAIE) offered an innovative bridge training program that helps internationally-trained environmental professionals launch their careers in Engineering, Geoscience, Environmental Science and Planning [13]. PAIE's offered a special one-year program allows participants with an increased understanding of the local labor market [13]. PAIE supports applicants to pursue their career goals of obtaining employment and gaining the Canadian experience required for professional licensing and certifications [13].

IX. Mentorship

1. Engineering Connections –ACCESS

ACCES Employment assists job seekers from different professional backgrounds [14]. This program is specially for the professionals who are facing barriers to employment. ACCESS helps them to integrate into the Canadian job market [14]. To achieve this goal ACCESS is providing employment services, linking employers to skilled people and building strong networks in collaboration with community partners [14].

2. Mentoring partnership

A good mentoring program can be found for those who have been in Canada for less than 3 years [15].

X. Internships

1. The Engineering Intern Training program (PEO)

- The Engineering Intern Training (EIT) Program [15] is for applicants who are employed in engineering capacity. It is not job search or placement program.
- Provides guidance and assistance to engineering graduates to acquire 48 months of acceptable engineering work experience, to help qualify for P.Eng. license and also offers networking opportunities.
- There is small annual fee.
- To request enrolment, send e mail to eit@peo.on.ca

2. Career Edge Internship Program

Career Edge is Canada's biggest program which is providing paid internships to the eligible candidates by a unique connection with different companies. Career Edge, giving job seekers the chance to break into the workforce and launch their career [16].

3. OPS Internship Program for Engineers

- For Civil, Chemical, Electrical and Mechanical engineering
<http://www.gojobs.gov.on.ca/ITE.asp>

XI. Useful links (Organizations)

Following are some useful links for new internationally trained engineers:

1. PIN (Professional Immigrant Network)

2. Networking for new immigrants

www.networkforimmigrants.ca

www.engineeringcareerpathways.ca

3. Guide to Licensing and Career Map

[ww.ontarioimmigration.ca/OI/en/working/OI_HOW_WORK_ENGINEER_CM.html](http://www.ontarioimmigration.ca/OI/en/working/OI_HOW_WORK_ENGINEER_CM.html)

4. Ontario Society of Professional Engineers:

- Advocacy organization by PEO
<http://www.ospe.on.ca>

5. Municipal Engineers Associations

- Networking / problems solving for engineers

<http://www.municipalengineers.on.ca/>

6. Finding Employment in Engineering

Engineering jobs (very useful links)

www.ontario.ca/employmentontario

www.tcu.gov.on.ca/eng/ojf/index.html

XII. Alternative Careers for Engineers in the Category of Technologist and Technicians:

1. For Civil Engineering: Technologist/ Technician

Occupation	Example Titles	Definition and Tasks	Educational Requirements
Civil Engineering Technologist	<ul style="list-style-type: none"> • Construction Technologist • Environmental Engineering Technologist • Municipal Engineering Technologist • Structural Design Technologist • Structural Analysis Technologist • Structural Engineering Technologist 	<ul style="list-style-type: none"> • Provide technical support and services to scientists, engineers and other professionals, or may work independently in fields such as structural engineering, municipal engineering, construction design and supervision, highways and transportation engineering, water resources engineering and environmental protection • NOC Code: 2231 	3-Year college program in civil engineering technology

Construction Manager/Project Coordinator	<ul style="list-style-type: none"> • Project Manager • Constructor • Construction Superintendent • Project Engineer • Program Manager • Construction Supervisor • General Contractor 	<ul style="list-style-type: none"> • Plan, direct, and coordinate a wide variety of construction projects, including the building of all types of residential, commercial, and industrial structures, roads, bridges, wastewater treatment plants, and schools and hospitals • Schedule and coordinate all design and construction processes, including the selection, hiring and oversight of speciality trade contractors. • Are salaried or self-employed managers who oversee construction supervisors and workers. • NOC Code-0711 	3-Year college program in civil engineering technology or construction technology
Construction Estimator	<ul style="list-style-type: none"> • Chief Estimator • Cost Estimator • Principal Estimator • Professional Quantity Surveyor • Quantity Supervisor 	<ul style="list-style-type: none"> • Analyze costs of and prepare estimates on civil engineering, architectural, structural, electrical and mechanical construction projects. • Employed by residential, commercial and industrial construction companies and major electrical, mechanical and trade contractors or they may be self-employed. • NOC Code: 2234 	3-year college program in civil engineering or construction engineering technology
Land Survey Technologist	<ul style="list-style-type: none"> • Engineering Survey Technologist • Geodetic Survey Technologist • Geomatics Technologist – Land Surveying 	<ul style="list-style-type: none"> • Conduct or participate in surveys to determine the exact locations and relative positions of natural features and other structures on the earth's surface, underground and underwater. • Employed by all levels of government, architectural and engineering firms, and by private sector surveying establishments. • NOC Code: 2254 	3-year college program in geomatics or land survey technology
Architectural Technologist	<ul style="list-style-type: none"> • Architectural Design Technologist 	<ul style="list-style-type: none"> • May work independently or provide technical assistance to professional architects and civil design engineers in conducting research, preparing drawings, architectural models, specifications and contracts and in supervising construction projects. • Employed by architectural and construction firms, and governments. 	3-year college program in civil engineering or architectural technology

<p>Civil Engineering Technician</p>	<ul style="list-style-type: none"> • Construction Technician • Bridge Design Technician • Environmental Engineering Technician • Municipal Engineering Technician • Materials Testing Technician • Water Treatment Technician • Urban Planning Technician • Soil-Mechanics Technician 	<ul style="list-style-type: none"> • NOC Code: 2251 <p>See description for Civil Engineering technologist</p>	<p>2-Year college program in civil engineering technology, urban and regional planning, or environmental science</p>
<p>Construction Inspector</p>	<ul style="list-style-type: none"> • Bridge Inspector • Building Construction inspector • Construction Inspector • Highway Construction Inspector • Home Inspector • Housing Construction inspector • Mine Inspector • Plumbing Inspector • Pre-stressed concrete inspector • Safety officer-construction 	<ul style="list-style-type: none"> • Inspect the construction and maintenance of new and existing buildings, bridges, highways and industrial construction to ensure that specifications and building codes are observed and monitor work site safety. • Employed by federal, provincial and municipal governments, construction companies, architectural and civil engineering consulting firms or they may be self-employed. • NOC Code: 2264 	<p>2-year college program in architectural technology, civil engineering, or construction engineering technology</p>

Land Survey Technician	<ul style="list-style-type: none"> • Legal Survey Technician • Topographic Survey Technician • Transit Operator-surveying 	<ul style="list-style-type: none"> • Conduct or participate in surveys to determine the exact locations and relative positions of natural features and other structures on the earth's surface, underground and underwater. • Employed by all levels of government, architectural and engineering firms, and by private sector surveying establishments. • NOC Code: 2254 	2-year college program in geomatics or land survey technology
Drafting Technician	<ul style="list-style-type: none"> • Computer-Assisted Design and Drafting Technologist • Computer-Assisted Drafting (CAD) Technician • Design and Drafting Technologist • Draftsperson (Various Types) • Engineering Design and Drafting Technologist • Steel Detailer-drafting • Structural Steel Drafter detailer • Supervisor, Drafting Office 	<ul style="list-style-type: none"> • Prepare engineering designs, drawings and related technical information using computer-added design (CAD). In multidisciplinary engineering teams or in support of engineers, architects or industrial designers, or they may work independently • Employed by consulting and construction companies, utility resource and manufacturing companies, all levels of government and by wide range of other establishments. • NOC Code 2253 	2-year college program in civil engineering, engineering design, or drafting technology

2. For Chemical Engineering: Technologist

Chemical Engineering technologist	<ul style="list-style-type: none"> • Chemical Technologist • Food Technologist • Industrial Hygienist 	<ul style="list-style-type: none"> • Provide technical support and services or may work independently in chemical engineering, chemical and biochemical research and analysis, industrial chemistry, chemical quality control and environmental protection • Employed by research, development, quality control laboratories, consulting engineering companies, chemical, petrochemical, pharmaceutical, other manufacturing and processing industries and health, educational and government establishments. • NOC Code: 2211 	3-year college program in chemical engineering technology
Biological Technologist	<ul style="list-style-type: none"> • Agricultural/Biotechnology/Biochemical Technologies (NOC Code: 2221) • Biomedical Engineering Technologist (NOC Code:2241) 	<ul style="list-style-type: none"> • Work with scientist, engineers and other professional in fields such as agriculture, resource management, environmental protection, plant and animal biology, microbiology, cell and molecular biology and health sciences, or may work independently in these fields. • Employed in both laboratory and field settings by governments, manufacturers of food products, chemicals, and pharmaceuticals, biotechnology companies, health, research and educational institutions, environmental consulting companies and resources and utilities companies. 	Varies

3. Mining Engineering: Technician

Geological and Mineral Technician	<ul style="list-style-type: none"> • Assay Technician • Exploration Technician • Geological Engineering Technician • Groundwater Technician • Metallurgical Technician • Mine Surveying Technician • Mineralogy Technician • Mining Technician • Petroleum Technician • Process Operations Technician • Reservoir Engineering Technician • Rock Mechanics Technician • Seismic Technician 	See Description for Geological and Mineral Technologist	2 or 3-year college program in geological or metallurgical engineering technology or materials science
Land Survey Technician		See Description under Civil Engineering Technician	

4. Electrical Engineering: Technician

Electrical Engineering Technician	<ul style="list-style-type: none"> • Communications Technician • Electronics Engineering Technician • Electronics Manufacturing Technician • Microwave Maintenance Technician • Production Support Technician-Electronics Manufacturing • Electrical Power Systems Technician 	See Description for Electrical or Electronics Engineering Technologist	2-Year college program in electrical engineering technology
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5. Mechanical Engineering: Technologist

<p>Mechanical Engineering Technologist</p>	<ul style="list-style-type: none"> • HVAC Technologist (see Appendix I) • Aeronautical Technologist • Marine Engineering technologist • Machine Design Technologist • Mould Design Technologist • Nuclear Technologist • Power Engineering Technologist • Propulsion Systems Technologist • Tool and Die Design Technologist • Tool Design Technologist 	<ul style="list-style-type: none"> • Provide technical Support and services or may work independently in mechanical engineering fields such as the design development, maintenance and testing of machines, components, tools, heating and ventilating systems, power generation and power conversion plants, manufacturing plants and equipment • Employed by consulting engineering, manufacturing and processing companies, institution and government departments. • NOC Code: 2232 	<p>3-year college program in mechanical or marine engineering technology</p>
<p>Manufacturing Engineering Technologist</p>	<ul style="list-style-type: none"> • Industrial Engineering Technologist • Loss Prevention Technologist • Pulp and Paper Manufacturing Technologist • Quality Assurance Technologist • Textile Technologist 	<ul style="list-style-type: none"> • May work independently or provide technical support and services in development of production methods, facilities and systems, and the planning, estimating measuring scheduling of work • Employed by manufacturing and insurance companies, government departments, and establishments in other industries • NOC Code: 2233 	<p>3-year college program in industrial or manufacturing engineering technology</p>

6. Mechanical Engineering: Technician

Mechanical Engineering Technician	<ul style="list-style-type: none"> • Aeronautical Engineering Technician • Heating Designer • HVAC Technician • Marine Engineering Design Technician • Marine Engine Room Layout Technician • Robotics Technician • Thermal Station Technician 	See description for Mechanical Engineering Technologist	2-year college program in mechanical or electrical or marine engineering technology
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7. Mining Engineering: Technologist

Geological and Mineral Technologist	<ul style="list-style-type: none"> • Geophysical Technologist • Groundwater Technologist • Marine Geoscience Technologist • Metallurgical Technologist • Mine Surveying Technologist • Mining Engineering Technologist • Petroleum Engineering Technologist • Welding Technologist 	<ul style="list-style-type: none"> • Provide technical support and services or may work independently in the fields of oil and gas exploration and production, geophysics, petroleum engineering, geology, mining and mining engineering, mineralogy, extractive and physical metallurgy, metallurgical engineering and environmental protection • Employed by petroleum and mining companies, consulting geology and engineering firms, and by governments and educational institutions as well as by a variety of manufacturing, construction and utilities companies. • NOC Code: 2212 	3-year college program in geological or marine or materials testing engineering technology
Construction Manager		See description under Civil Engineering Technologist	
Land Survey Technologist		See description under Civil Engineering Technologist	

XIII. Career in Information Technology (IT) – An Overview

(Especially for Computer Engineer/Scientist/Technicians)

Because computers have become such an integral part of everyday life, IT careers have become more common. Computer programmers, support specialists and systems analysts are just a few typical information technology careers.

- Programmers are the translators who convert software developers' designs into codes that computers understand.
- Support specialists are the ambassadors who help ordinary people when they encounter problems with their computers.
- Systems analysts work with businesses to ensure that the companies' computers and networks are working efficiently. Figures 1 (a) & (b) describes the basic path way and the road map of careers in IT.

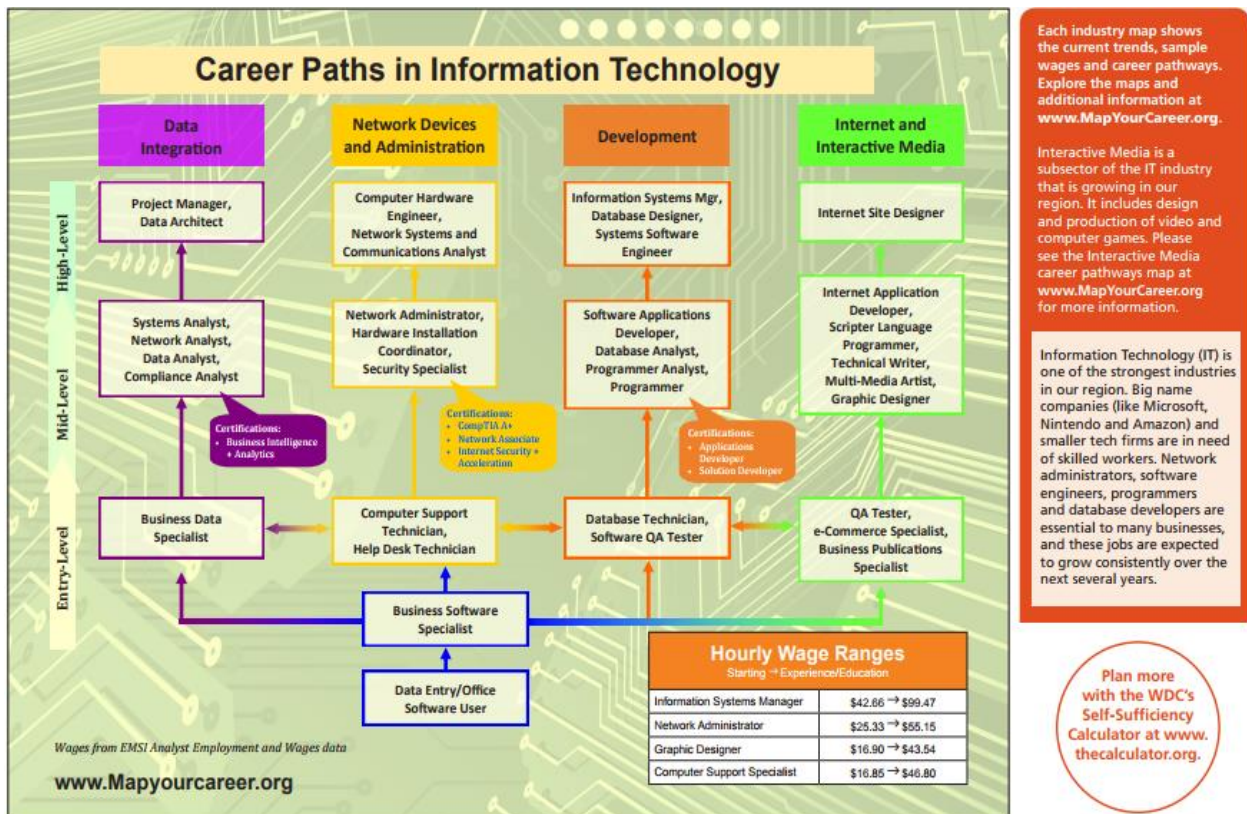


Figure 1 (a) : Brief layout of career paths in Information Technology [20]

IT Certification Roadmap

Explore the possibilities with the CompTIA Interactive IT Roadmap at: CompTIA.org/CertsRoadmap

CompTIA

Certifications validate expertise in your chosen career.

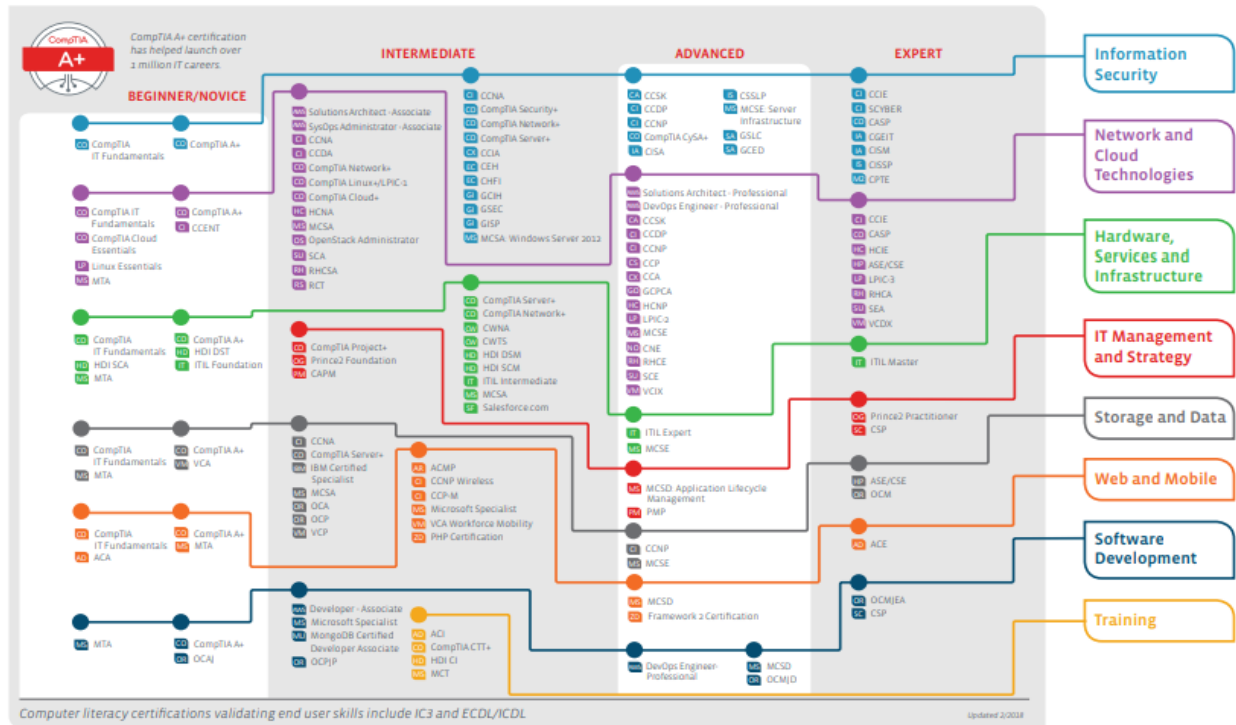


Figure 1(b): Brief layout of IT certification Roadmap [20]

1. What Does A Security Auditor Do?

A Security Auditor probes the safety and effectiveness of computer systems and their related security components. After conducting a security audit, they issue a detailed report that outlines the effectiveness of the system, explains any security issues and suggests changes and improvements.

2. Security Auditor Responsibilities [21]

In this mid-level role, you may be required to:

- Plan, execute and lead security audits across an organization
- Inspect and evaluate financial and information systems, management procedures and security controls
- Evaluate the efficiency, effectiveness and compliance of operation processes with corporate security policies and related government regulations

- Develop and administer risk-focused exams for IT systems
- Review or interview personnel to establish security risks and complications
- Execute and properly document the audit process on a variety of computing environments and computer applications
- Assess the exposures resulting from ineffective or missing control practices
- Accurately interpret audit results against defined criteria
- Weigh the relevancy, accuracy and perspective of conclusions against audit evidence
- Provide a written and verbal report of audit findings
- Develop rigorous “best practice” recommendations to improve security on all levels
- Work with management to ensure security recommendations comply with company procedure
- Collaborate with departments to improve security compliance, manage risk and bolster effectiveness
- Travel extensively (Canadian citizen status will help however Permanent residence with US Visa is always an option)
- Some Security Auditors work as independent consultants; others are integral members of IT security teams. Senior Security Auditors, like Senior Security Architects, may answer to C-level executives

In our industry, there are plenty of regulations exists in the market place for the entities and they are bound to show their compliance with the specific regulations as per their business need e.g. PCI for those who are in payment transaction business, HITRIST/HIPPA who are in healthcare business and GDPR for those who store/process and transmit EU citizen personal information.

3. Security Auditor Career Paths

Just starting out on your career path? Consider an entry-level job that will give you some exposure to security issues. For example:

- Security Administrator (Technology Firewall, MFA, RSA, SIEM, Load-balancer, VPNs etc.)
- Network Administrator (Cisco, Junider, Dell, HP, PaloAlto etc.)
- System Administrator (MicroSoft, vMware, HyperVisor, RH/Linux/Unix/ubuntu etc.)

On the rung above this level are dedicated IT security positions such as:

- Security Specialist
- Security Analyst
- Security Engineer

- Security Consultant

Some auditors choose to stay forever in the world of technical testing. But if you're interested in shifting to management, you could investigate:

- Security Manager
- IT Project Manager
- Security Director
- CISO

4. Similar Jobs

Security Auditors are known by a variety of names. Some of them (like IT Auditor) may have testing tasks that are unrelated to security.

- Information Security Auditor
- Information Systems Auditor
- IA Auditor
- IT Auditor

5. Certification Recommended for IT Auditors and Security Professionals [22]

a. Information Security

- i. (ISC)2 Certified Information System Security Professional (CISSP) is a high-level credential focused on security policy and management. This is the most frequently mentioned certification in the business. It was also one of the top-paying IT security certifications in 2014.
- ii. ISACA Certified Information Security Manager (CISM) is geared towards people in managerial positions (e.g. CIO of IT security).
- iii. CEH: Certified Ethical Hacker is often discussed among white hat hackers and penetration testers.
- iv. Certified ISO 27001 lead implementer.

b. Audit

- i. ISACA Certified Information Systems Auditor (CISA) is designed for professionals who audit, control, monitor and assess information technology and business systems.
- ii. GIAC Systems and Network Auditor (GSNA) is for incident handlers responsible for detecting, responding to and resolving computer security incidents.
- iii. Certified ISO 27001, Lead Auditor, Internal Auditor 1
- iv. IRCA ISMS Auditor or higher (e.g., Auditor/Lead Auditor, Principal Auditor)
- v. IIA Certified Internal Auditor (CIA).

6. Work Experience

Many security auditors have little dedicated security experience, but have done lots of work in IT. Broadly speaking, Security Auditors are expected to have around 3-6 years of experience in general IT. Senior Security Auditors often have 5+ years of auditing experience.

Please note people with Information Technology and Security background are more successful in IT security Audit than the people who just completed CISA and have no technical hands on experience on technology.

7. Hard Skills

Wherever and whenever you can, gain experience in auditing computer applications and information systems of varying complexity. Employers may also specify a working knowledge of:

- Working knowledge of regulatory and industry data security standards (e.g. PCI-DSS, HIPAA, HITRUST, EI3PA, SOC1/2, GDPR, SOX, NIST, Privacy Shield, AUP)
- ISO 27001/27002, ITIL and COBIT frameworks
- Windows, UNIX and Linux operating systems
- MSSQL and ORACLE databases
- C, C++, C#, Java and/or PHP programming languages
- ACL, IDEA and/or similar software programs for data analysis
- Fidelis, ArcSight, Niksun, Websense, ProofPoint, BlueCoat and/or similar auditing and network defense tools
- Firewall and intrusion detection/prevention protocols

- Access Control fundamentals
- VLANs and network segmentation concepts.

8. Soft Skills

- Brush up on your oral and written communication skills – a Security Auditor is often judged by the clarity and thoroughness of his/her reports
- Employers will also be looking for candidates who aren't afraid of travel. Auditors frequently have to visit a wide variety of sites to gather data (onsite).

XIV. References

- [1] http://www.peo.on.ca/index.php/ci_id/14824/la_id/1.htm
- [2] http://www.peo.on.ca/index.php/ci_id/22629/la_id/1.htm
- [3] http://peo.on.ca/index.php?ci_id=2063&la_id=12003
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- [12] <https://learn.utoronto.ca/international-professionals/bridging-program-engineers>
- [13] <https://paietraining.ca/page/about-program>
- [14] <http://www.accesemployment.ca/about-us>
- [15] http://www.peo.on.ca/index.php?ci_id=2064&la_id=1
- [16] <https://www.careeredge.ca/for-job-seekers/>
- [17] www.collegeoftrades.ca
- [18] www.tssa.org
- [19] www.hrai.ca
- [20] <https://certification.comptia.org/docs/default-source/downloadablefiles/it-certification-roadmap.pdf>
- [21] <https://www.cyberdegrees.org/jobs/security-auditor/>
- [22] <https://www.pcisecuritystandards.org>

XV. Appendix I

There are 156 skilled trades in Ontario regulated by Ontario College of Trades [17]. Among them there are 23 trades are compulsory means registrations as an apprentice, journeyman candidate or certification as a journeyman is mandatory.

If you want to consider a career in HVAC industry in Ontario, you need to have a couple of licenses as the following:

- Gas license G1 or G2 or G3. Those licenses are regulated by Technical Standards and Safety Authority (TSSA) [18]. You need this license for installation, repair, and maintenance of gas-fired equipment.
- ODP Card which can be provided by The Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI) [19]. You need this card to buy and handle refrigerants.
- Refrigeration and Air Conditioning Systems Mechanic (313A) OR Residential Air Conditioning Systems Mechanic (313D) license. Those are compulsory trades and regulated under Ontario College of Trades.

If you want to start quickly in this industry, you can get your ODP card which is 1-day course followed by an exam. Then you can either challenge G3 gas license directly (you need to pass a practical test and written exam to get your license) OR complete a Gas Technician (G.3) course in recognized training school by TSSA then write the exam (you don't need a practical test if you complete the course).

The most requested gas license by employers in Ontario is Gas Technician G2. You can challenge it if you have already G3 and 4000 hours of work experience has been accumulated as a G.3 from the date the certificate was issued. Work experience is fully documented and verified by the supervising certificate holder and the employer. In case you don't have 4000 hours of work experience, you can complete a G2 course in recognized training school by TSSA then write the exam.

In next step, you can think about G1 which you can either write the exam if you have already G2 and you have two years (4000 hours) of field experience as a G.2, and you complete a G1 course in

recognized training school by TSSA then write the exam OR you can challenge it if you have you have two years (4000 hours) of field experience as a G.2 of which a minimum of 500 hours are on systems larger than 400,000 Btuh under direct supervision of a G.1 certificate holder.

To get your license of Refrigeration and Air-conditioning 313A / Residential Air Conditioning Systems Mechanic (313D), a couple of options are available:

- (i) Look for an employer who can register you as an apprentice, then you needs to complete 5-years apprenticeship program at 1,800 hours per year.

You can challenge the exam if you have already an experience in the field and you have more than 9000 hours. To start this process, you need to submit The Trade Equivalency Assessment (TEA) application with supporting documents to Ontario College of Trades. If your application is approved, you can write the exam.

- **Rehan Siddiqui, PhD, M.Eng. (N. Power Engineering), P.Phys. (CAP)**
- **A.Jaidane, RSE**
- **N. Khan, B.E. (Computer Information Systems)**
- **Aurang Zaib Siddiqui,MS (CS), CISSP, PCI QSA, HiTrust CSF, ITIL, Win-Hyper V & SC, MCSE, CCNA**
- **S.M.Khan, B.A, A.J.P**
- **A.Rasool (Diploma in Accounting)**

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