

Computer & Software Engineers

A guide for newcomers to British Columbia



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1. Working as a Computer or Software Engineer [NOC 2021: 21311 & 21231 / NOC 2016: 2147 & 2173]

Job Description

Computer engineers design and create computers and related hardware components. You may also design and develop information and communication system networks.

As a *computer engineer* you perform the following duties:

- Analyze users' requirements for new products
- Design computer and telecommunications hardware such as circuit boards and monitors
- Design and develop information system network architecture
- Develop and conduct tests to make sure the new designs and components function as expected
- Oversee the manufacturing process
- Establish and maintain relationships with suppliers and clients
- May lead and co-ordinate teams of engineers, technologists, technicians

Software engineers design, develop and test software products for various uses.

As a *software engineer* you perform the following duties:

- Analyze users' requirements
- Design and test software products or computer systems

- Co-ordinate the development, installation, and operation of computer-based systems
- Troubleshoot, upgrade and develop maintenance procedures for operating systems and applications
- May lead and co-ordinate teams of information systems professionals

You can learn more about working as a computer engineer or a computer software engineer in BC from:

- **WorkBC Career Profiles for Computer Engineers & Software Engineers**
<https://www.workbc.ca/Jobs-Careers/Explore-Careers.aspx>
- **Career Cruising - Profiles for Computer Hardware Engineer & Computer Software Engineer**
https://www.vpl.ca/electronic_databases/alpha/c
Available from the VPL Digital Library | Explore our Digital Library page
- **Information and Communications Technology Council (ICTC)**
<https://www.ictc-ctic.ca/>

Industry Overview

Computer engineers: WorkBC identifies this as a “high opportunity” occupation and job prospects are expected to be good. There are currently not enough new computer engineering graduates with the right mix of experience and skills to meet employment demand.

In British Columbia your job may not have a complete focus on hardware, but also work with processes, electrical engineering, and software implementation.

Employment trends depend on the industries that purchase hardware products. As such, your job opportunities may be affected by fluctuations in the economy or in specific sectors.

Computer engineering is a constantly changing field. It is important to update your skills throughout your career.

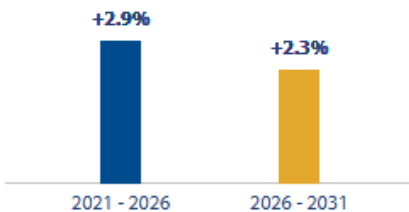
Software engineers: WorkBC identifies this as a “high opportunity” occupation, with 9,340 job openings forecast from 2021 to 2031. It is important to continue to update your skills regularly in order to keep up with improvements and changes in technology.

The health care industry will increasingly need software engineers to design, and maintain safe and secure eHealth information systems.

Job Outlook in BC

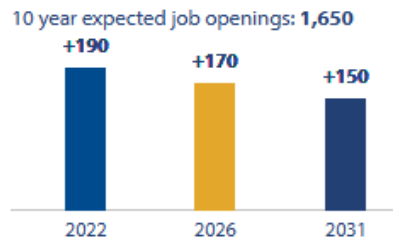
Computer Engineers

Forecasted average employment growth rate



Source: B.C. Labour Market Outlook

Job openings

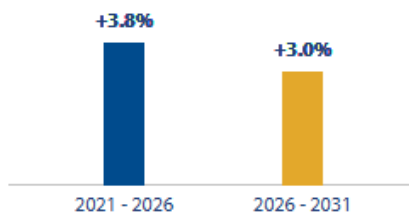


Source: B.C. Labour Market Outlook

Chart from WorkBC

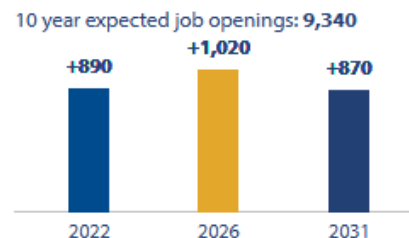
Software engineers

Forecasted average employment growth rate



Source: B.C. Labour Market Outlook

Job openings



Source: B.C. Labour Market Outlook

Chart from WorkBC

WorkBC provides job openings in BC regions from 2021-2031:

Region	Employment in 2021	Average Annual Employment Growth 2021-2031	Expected Number of Job Openings 2021-2031
Vancouver Island			
▪ Computer Engineers	290	2.1%	15
▪ Software Engineers	1,010	3.3%	670
Lower Mainland / Southwest			
▪ Computer Engineers	2,620	2.6%	1,430
▪ Software Engineers	12,920	3.3%	8,240
Thompson-Okanagan			
▪ Computer Engineers	60	3.8%	50
▪ Software Engineers	320	6.0%	330
Kootenay			
▪ Computer Engineers	30	4.8%	30
▪ Software Engineers	100	4.4%	70
Cariboo			
▪ Computer Engineers	30	0.3%	10
▪ Software Engineers	40	4.8%	40

Sources:

- WorkBC Career Profiles
- Career Cruising Database

Types of Employers

Computer engineers are employed throughout public and private sectors, such as:

- computer and telecommunication hardware manufacturers
- engineering, manufacturing and telecommunications firms
- information technology consulting firms
- government
- education and research institutions
- health care

Software engineers are employed by a variety of organizations including:

- information technology consulting firms that provide software-related information technology services
- information technology research and development firms
- software product manufacturers

- you may telecommute from a home office

You may also be self-employed.

Salary

In BC, the median annual salary for *computer engineers* is \$112,310. The median annual salary for *software engineers* is \$108,451. Earnings vary according to your level of education, experience and the type of company you work for.

If you are employed in a full-time job you may also receive benefits such as health and dental insurance, paid vacation and sick leave. Some companies also provide you with the annual profit-sharing or performance-based bonuses.

Sources:

- WorkBC Career Profile
- Career Cruising

In BC regions, you can expect to earn:

Computer Engineers

Community/Area	Wages (\$/hour)		
	Low	Median	High
British Columbia	26.44	53.85	79.33
Lower Mainland–Southwest Region	26.44	53.85	79.33
Vancouver Island and Coast Region	26.44	53.85	79.33

Source: Job Bank Canada Wage Report <https://www.jobbank.gc.ca/trend-analysis/search-wages>

Software engineers

Community/Area	Wages (\$/hour)		
	Low	Median	High
British Columbia	28.85	52.00	72.12
Lower Mainland–Southwest Region	29.49	52.88	72.12
Thompson–Okanagan Region	28.85	52.00	72.12
Vancouver Island and Coast Region	28.85	52.00	72.12

Source: Job Bank Canada Wage Report <https://www.jobbank.gc.ca/trend-analysis/search-wages>

Working Hours

You usually work an average of 5 days, Monday to Friday, totaling 40 hours per week. However, longer hours and overtime are often required to meet deadlines.

2. Skills, Education and Experience

Skills

- Curious
- Aptitude for math and science
- Logical and detail-oriented
- Work well as part of a team
- Problem-solving skills
- Analytical skills
- Communication skills
- Ongoing learning

Education and Experience

Computer Engineers & Software Engineers require:

- Bachelor's degree in computer engineering, software engineering, computer science or related field

You may also require:

- Registration with Engineers & Geoscientists British Columbia
- Past participation in an undergraduate co-op program
- Master's or doctoral degree in a related discipline
- Network certification for computer engineers
- Information Systems Professional (ISP) certification through the Canadian Information Processing Society (CIPS)

Source: WorkBC

Qualifications

There are no mandatory requirements for licensing or professional certification in order to work in entry level computer and software engineering positions.

However, you must be licensed by ***Engineers & Geoscientists British Columbia*** if you use the title "Engineer." This allows you to approve engineering drawings and reports and to practise as a professional engineer (P.Eng.).

Registration requires:

- graduation from an accredited educational program
- four years of supervised work experience in engineering
- successfully passing the professional practice examination
- completion of the law and ethics seminar

How to apply:

- **Engineers & Geoscientists British Columbia – How to Apply**
<https://www.egbc.ca/Registration/Individual-Registrants/How-to-Apply>

If you do not meet the minimum academic requirements for P.Eng, you may register as **Professional Licensee (P.L.Eng)**, which requires:

- academic qualifications other than an engineering degree from a recognized university
- several years of experience in a defined area of engineering practice

For more information:

- **Engineers & Geoscientists British Columbia – Professional Membership & Licence**
<https://www.egbc.ca/Registration/Individual-Registrants/How-to-Apply/Professional-Membership-and-Licence>
 - **Bridging Pilot Program:** Program to assist Professional Licensee Engineers (P.L.Eng) apply to bridge to Professional Engineer (P.Eng)
<https://www.egbc.ca/Registration/Individual-Registrants/How-to-Apply/Bridging-Pilot-Program>
 - **Self-Assessment Tool**
Online self-assessment tool to assist ***internationally trained professionals*** enter the profession of engineering in BC.
<https://www.egbc.ca/Registration/Programs-Resources/Self-Assessment-Tool>
- **Canadian Information Processing Society (CIPS) Certification**
<https://cips.ca/certification/>
- **Engineer Here – Becoming a Licensed Engineer in Canada**
<https://engineerhere.ca/>
- **International agreements** between professional engineering associations
<https://engineerscanada.ca/become-an-engineer/agreements-on-international-mobility>
- **Go Talent, Information & Communications Technology Council (ICTC)**
<https://www.etalentcanada.ca/employment-programs/go-talent/>
Assists Internationally Educated Professionals (IEPs) immigrating to Canada as permanent residents find employment in the IT sector before they arrive

3. Finding Jobs

You'll find job advertisements in local newspapers and electronic sources, as well as through professional associations' publications.

Local Newspapers

You can look at the *Vancouver Sun* & *The Province* at Vancouver Public Library for free. Check the job postings daily, the careers section in the *Vancouver Sun* on Wednesdays and Saturdays and, in *The Province* on Sundays.

Online Job Postings

- **Engineering Careers**
<https://www.engineeringcareers.ca>
- **Indeed**
<https://ca.indeed.com/>
- **Talent.com**
<https://ca.talent.com>

Professional Associations' Career Resources

- **Engineers & Geoscientists Career Listings**
<https://www.egbc.ca/Careers/Career-Listings>
- **BC Technology Industry Association (BC TIA) Careers Page**
<https://www.bctechjobs.ca/>
- **Institute of Electrical and Electronics Engineers (IEEE)**
<https://jobs.ieee.org/>

Identifying the Right Position

When you browse job advertisements, you'll find different job titles.

For Computer Engineers, look for these related job titles:

- Computer Hardware Engineer
- Fibre-optic Network Designer
- Hardware Circuit Board Designer
- Hardware Development Engineer
- Network Test Engineer
- Systems Designer – Hardware
- Technical Architect – Hardware
- Wireless Communications Network Engineer

For Software Engineers, look for these related job titles:

- Application Architect
- Computer Software Engineer

- Software Architect
- Software Design Engineer
- Software Testing Engineer
- Systems Integration Engineer – Software
- Technical Architect – Software
- Telecommunications Software Engineer

Source: *National Occupational Classification* <https://noc.esdc.gc.ca/>

Creating a List of Potential Employers

You can use directories to produce lists of employers in Vancouver or the Lower Mainland. Contact them directly to find out if they're hiring.

- **BC Tech, Technology Guide** (special issue of Business in Vancouver)
Available at the Central Library, 380 EL3CBh
- **BC Tech Association Membership Directory**
<https://wearebctech.com/members/member-directory/>
- **Reference Canada**
https://www.vpl.ca/electronic_databases/alpha/r
Go to the "Reference Canada" database and look for "Canadian Businesses" at top of page and choose the "Custom Search" tab. Select "Business Type" and click on "Keyword/SIC/NAICS" and then enter keywords, for example, enter "computer" or "software" and click LOOKUP and then select appropriate headings. You can combine these headings with a location by clicking on "Geography", select the province, choose the cities and click the "View results" button at top left side of page.

Available from the Online Articles, Encyclopedias & More page.

NOTE: *You can access this database from a Library computer. If you are using a computer from outside the Library, you will need a Vancouver Public Library card to login to this database. After clicking on the database name, you will be asked to enter your library card number and PIN (usually last four digits of your telephone number).*

4. Applying for a Job

In Canada, employers usually expect to receive a resume or curriculum vitae and a cover letter that identifies the position you are applying for and summarizes your relevant experience.

Use the library catalogue, <https://vpl.bibliocommons.com/> to find books on writing resumes and cover letters specific to your industry.

To learn about applying for jobs in Canada, use the following guides which are available in print at the Central Library or online at <https://www.vpl.ca/siic/>.

- **Writing Resumes and Cover Letters**
<https://www.vpl.ca/siic/guide/job-search-resources/writing-resumes-and-cover-letters>
- **Getting Canadian Work Experience**
<https://www.vpl.ca/siic/guide/job-search-resources/getting-canadian-work-experience>
- **Networking for Employment**
<https://www.vpl.ca/siic/guide/job-search-resources/networking-for-employment>
- **Learn More About Working in BC and Canada**
<https://www.vpl.ca/siic/guide/job-search-resources/learn-more-about-working-in-bc-and-canada>

5. Getting Help from Industry Sources

Industry Associations

Associations for computer & engineering professionals in BC and Canada can provide you with information and assistance. Registration and fees may be required for membership.

- **Engineers & Geoscientists British Columbia**
<https://www.egbc.ca/>

- **BC Tech Association**
<https://wearebctech.com/>
- **eTalent Canada**
<https://www.etalentcanada.ca/>
- **Information & Communications Technology Council (ICTC)**
<https://www.ictc-ctic.ca/>
- **Canadian Information Processing Society**
<https://cips.ca>
- **Engineering Institute of Canada (EIC)**
<https://eic-ici.ca/>
- **Engineers Canada**
<https://engineerscanada.ca/>
- **Institute of Electrical and Electronics Engineers Canada (IEEE Canada)**
<https://vancouver.ieee.ca/> Vancouver Chapter
- **Institute for the Certification of Computing Professionals (ICCP)**
<https://iccp.org>
- **Society of Punjabi Engineers and Technologists of British Columbia**
<https://speatbc.org/>

Industry Journals

Search the Vancouver Public Library catalogue for journals related to your profession: <https://vpl.bibliocommons.com/>

Examples at the Central Library and online include:

- **Computing Canada**
<https://www.itworldcanada.com/computing-canada>
- **Innovation: Journal of Engineers & Geoscientists British Columbia**
Available at VPL Central Library, 620.5 B86 and online at:
<https://www.egbc.ca/About/Publications/Innovation/Innovation-Past-Issues>

**Questions? Please ask the Information Staff in the Central Library,
Vancouver Public Library or telephone 604-331-3603.**

Please note that the information in this guide is also available online through the
Skilled Immigrant InfoCentre website at <https://www.vpl.ca/siic/>

