

WORKBC LABOUR MARKET OUTLOOK PROFILE

SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) OCCUPATIONS

About this report

This is a summary of forecast information for science, technology, engineering and mathematics (STEM) occupations from the B.C. Labour Market Outlook 2019 edition forecast. An overview of this forecast is provided in the main report which is available at: www.workbc.ca/labourmarketoutlook. The raw data is available at: [BC Data Catalogue](#).

Please note that this profile covers a set of defined STEM occupations across all industries in the economy. This is a different perspective from the B.C. Stats Profile of the British Columbia High Technology Sector, which covers employment across all occupations in a defined set of high technology industries.

1. Outlook Highlights

STEM occupations include natural and applied sciences occupations such as engineers, computer scientists and biologists, technical occupations in motion pictures and broadcasting, telecommunications workers, and related management occupations. Many STEM occupations are skilled professions that require years of training.

At an annual average rate of 1.4%, employment in STEM occupations is expected to grow faster than occupations as a whole in the province (1.0%) over the 2019-2029 forecast period. This rate of growth is anticipated due to expected faster growth in industries such as Computer Systems Design and Related Services, Architectural, Engineering and Related Services, Telecommunications, and Motion Picture and Video Industries.

There will be over 74,300 job openings over the 10-year period to 2029 for this occupational group. Approximately 61 percent of those job openings are due to the need to replace retiring professionals.

WORKBC LABOUR MARKET OUTLOOK PROFILE

1.1 B.C. occupational group employment and job openings

| | Employment | | Employment Growth | | | Job Openings | | Replacement Rate |
|----------------------------|-------------------|---------------|-----------------------|-----------|-----------|--------------------|---------------|-----------------------|
| | Number of Workers | Share of B.C. | (Average Annual Rate) | | | Number of Openings | Share of B.C. | (Average Annual Rate) |
| | 2019 | 2019 | 2019-2024 | 2024-2029 | 2019-2029 | 2019-2029 | 2019-2029 | |
| STEM Occupations | 195,349 | 7.7% | 1.3% | 1.4% | 1.4% | 74,393 | 8.6% | 61.8% |
| B.C. All Industries | 2,521,389 | 100.0% | 1.0% | 1.0% | 1.0% | 861,143 | 100.0% | 69.5% |

1.2 B.C. occupational group job openings by type

| Job Openings | 2019-2024 | 2024-2029 | 2019-2029 |
|---------------------------|-----------|-----------|-----------|
| Total Job Openings | 34,667 | 39,727 | 74,393 |
| Expansion Demand | 12,578 | 15,851 | 28,430 |
| Replacement Demand | 22,088 | 23,875 | 45,963 |

2019-2029 total job openings¹: the total job openings in the 10 years between 2019 and 2029

1.3 B.C. occupational group employment growth and job openings by development region

| Region | Employment | Employment Growth (Average Annual Rate) | | | Job Openings | | |
|----------------------------------|------------|---|-----------|-----------|--------------|-----------|-----------|
| | 2019 | 2019-2024 | 2024-2029 | 2019-2029 | 2019-2024 | 2024-2029 | 2019-2029 |
| British Columbia | 195,349 | 1.3% | 1.4% | 1.4% | 34,667 | 39,727 | 74,393 |
| Vancouver Island/Coast | 27,896 | 1.3% | 1.4% | 1.4% | 5,592 | 6,011 | 11,603 |
| Mainland/Southwest | 140,085 | 1.3% | 1.5% | 1.4% | 24,833 | 29,003 | 53,836 |
| Thompson-Okanagan | 14,018 | 0.9% | 1.2% | 1.0% | 2,385 | 2,671 | 5,056 |
| Kootenay | 4,455 | 0.7% | 1.1% | 0.9% | 694 | 812 | 1,506 |
| Cariboo | 4,385 | 0.7% | 0.5% | 0.6% | 526 | 506 | 1,032 |
| North Coast & Nechako | 2,655 | -0.6% | 0.6% | 0.0% | 137 | 303 | 441 |
| Northeast | 1,856 | 3.1% | 1.8% | 2.4% | 500 | 419 | 919 |

¹ Replacements are retirements, deaths and other permanent labour force exits.

WORKBC LABOUR MARKET OUTLOOK PROFILE

2. Occupations

2.1 B.C. key indicators for the occupation group

| Skill Level | NOC | Occupation | Employment 2019 | Job Openings 2019-2029 | Average Annual Replacement Rate | Median Wage (\$) | Low Wage (\$) | High Wage (\$) |
|----------------------------|------|--|-----------------|------------------------|---------------------------------|------------------|---------------|----------------|
| 0 | 0131 | Telecommunication carriers managers | 1,522 | 530 | 3.8% | 30.77 | 40.00 | 45.67 |
| 0 | 0211 | Engineering managers | 2,743 | 1,331 | 3.5% | 38.46 | 54.00 | 72.31 |
| 0 | 0212 | Architecture and science managers | 1,184 | 617 | 3.7% | 21.43 | 43.81 | 86.46 |
| 0 | 0213 | Computer and information systems managers | 8,745 | 4,720 | 3.5% | 26.44 | 43.27 | 67.69 |
| Total Skill Level 0 | | | 14,193 | 7,199 | | | | |
| A | 2111 | Physicists and astronomers | 377 | 135 | 2.0% | 29.77 | 52.23 | 75.29 |
| A | 2112 | Chemists | 1,219 | 456 | 2.5% | 14.57 | 30.29 | 66.67 |
| A | 2113 | Geoscientists and oceanographers | 1,905 | 747 | 2.4% | 21.63 | 38.46 | 65.56 |
| A | 2114 | Meteorologists and climatologists | 144 | 37 | 2.2% | 0.00 | 0.00 | 0.00 |
| A | 2115 | Other professional occupations in physical sciences | 199 | 57 | 1.3% | 0.00 | 0.00 | 0.00 |
| A | 2121 | Biologists and related scientists | 3,728 | 1,020 | 1.4% | 26.00 | 35.71 | 50.26 |
| A | 2122 | Forestry professionals | 1,887 | 349 | 1.7% | 28.00 | 36.75 | 47.12 |
| A | 2123 | Agricultural representatives, consultants and specialists | 377 | 153 | 2.8% | 12.65 | 30.93 | 53.63 |
| A | 2131 | Civil engineers | 9,025 | 4,186 | 2.9% | 26.44 | 38.51 | 64.00 |
| A | 2132 | Mechanical engineers | 6,141 | 1,846 | 1.7% | 20.51 | 42.31 | 57.69 |
| A | 2133 | Electrical and electronics engineers | 6,276 | 2,025 | 1.9% | 27.50 | 36.92 | 50.00 |
| A | 2134 | Chemical engineers | 1,167 | 409 | 2.2% | 30.77 | 40.87 | 87.18 |
| A | 2141 | Industrial and manufacturing engineers | 1,340 | 470 | 2.5% | 20.21 | 33.61 | 48.23 |
| A | 2142 | Metallurgical and materials engineers | 377 | 116 | 1.9% | 23.16 | 49.65 | 87.66 |
| A | 2143 | Mining engineers | 867 | 213 | 1.4% | 0.00 | 0.00 | 0.00 |
| A | 2144 | Geological engineers | 1,113 | 405 | 1.9% | 29.23 | 35.00 | 48.08 |
| A | 2145 | Petroleum engineers | 221 | 86 | 2.2% | 0.00 | 0.00 | 0.00 |
| A | 2146 | Aerospace engineers | 330 | 97 | 2.1% | 21.44 | 38.34 | 63.19 |
| A | 2147 | Computer engineers (except software engineers and designers) | 2,623 | 1,020 | 2.3% | 19.00 | 47.69 | 64.78 |
| A | 2148 | Other professional engineers, n.e.c. | 1,039 | 337 | 1.9% | 21.63 | 39.00 | 55.63 |
| A | 2161 | Mathematicians, statisticians and actuaries | 837 | 259 | 1.8% | 24.59 | 39.07 | 71.79 |
| A | 2171 | Information systems analysts and consultants | 18,214 | 7,602 | 2.2% | 26.15 | 38.97 | 54.95 |
| A | 2172 | Database analysts and data administrators | 2,476 | 1,034 | 2.5% | 19.19 | 31.25 | 48.08 |
| A | 2173 | Software engineers and designers | 11,061 | 4,484 | 2.0% | 24.36 | 38.46 | 60.00 |
| A | 2174 | Computer programmers and interactive media developers | 15,566 | 6,292 | 1.6% | 20.00 | 35.19 | 51.10 |
| A | 2175 | Web designers and developers | 5,328 | 1,955 | 1.1% | 15.00 | 26.32 | 47.69 |
| Total Skill Level A | | | 93,835 | 35,788 | - | - | - | - |

WORKBC LABOUR MARKET OUTLOOK PROFILE

| Skill Level | NOC | Occupation | Employment 2019 | Job Openings 2019-2029 | Average Annual Replacement Rate | Median Wage (\$) | Low Wage (\$) | High Wage (\$) |
|-------------|------|--|-----------------|------------------------|---------------------------------|------------------|---------------|----------------|
| B | 2211 | Chemical technologists and technicians | 2,430 | 763 | 2.1% | 15.00 | 23.80 | 36.06 |
| B | 2212 | Geological and mineral technologists and technicians | 1,001 | 336 | 2.1% | 17.00 | 29.13 | 56.09 |
| B | 2221 | Biological technologists and technicians | 1,431 | 395 | 1.6% | 15.00 | 28.72 | 40.00 |
| B | 2222 | Agricultural and fish products inspectors | 643 | 188 | 2.4% | 21.00 | 28.37 | 33.14 |
| B | 2223 | Forestry technologists and technicians | 2,678 | 531 | 2.1% | 18.00 | 30.76 | 37.00 |
| B | 2224 | Conservation and fishery officers | 726 | 231 | 2.8% | 20.00 | 30.00 | 60.44 |
| B | 2225 | Landscape and horticulture technicians and specialists | 3,533 | 954 | 1.4% | 16.00 | 26.00 | 33.00 |
| B | 2231 | Civil engineering technologists and technicians | 2,660 | 979 | 2.4% | 21.00 | 33.15 | 74.36 |
| B | 2232 | Mechanical engineering technologists and technicians | 2,064 | 636 | 2.0% | 23.00 | 33.00 | 52.82 |
| B | 2233 | Industrial engineering and manufacturing technologists and technicians | 1,777 | 490 | 2.4% | 17.88 | 28.00 | 46.85 |
| B | 2234 | Construction estimators | 3,386 | 817 | 1.9% | 24.00 | 38.00 | 50.00 |
| B | 2241 | Electrical and electronics engineering technologists and technicians | 5,308 | 1,778 | 2.3% | 20.84 | 33.65 | 40.00 |
| B | 2242 | Electronic service technicians (household and business equipment) | 7,960 | 2,884 | 2.3% | 13.00 | 25.33 | 38.46 |
| B | 2243 | Industrial instrument technicians and mechanics | 1,032 | 319 | 2.1% | 0.00 | 0.00 | 0.00 |
| B | 2244 | Aircraft instrument, electrical and avionics mechanics, technicians and inspectors | 713 | 214 | 2.2% | 25.00 | 37.37 | 55.25 |
| B | 2261 | Non-destructive testers and inspection technicians | 598 | 263 | 2.8% | 19.26 | 33.65 | 50.00 |
| B | 2262 | Engineering inspectors and regulatory officers | 611 | 260 | 2.8% | 36.00 | 42.00 | 54.87 |
| B | 2263 | Inspectors in public and environmental health and occupational health and safety | 4,203 | 1,593 | 2.7% | 20.00 | 35.90 | 47.18 |
| B | 2264 | Construction inspectors | 2,573 | 1,239 | 3.8% | 19.00 | 28.00 | 43.00 |
| B | 2281 | Computer network technicians | 7,641 | 2,701 | 2.0% | 17.31 | 30.00 | 52.75 |
| B | 2282 | User support technicians | 5,563 | 2,045 | 2.1% | 18.00 | 29.00 | 50.00 |
| B | 2283 | Information systems testing technicians | 1,194 | 401 | 1.4% | 13.50 | 32.00 | 38.46 |
| B | 5222 | Film and video camera operators | 953 | 466 | 1.8% | 0.00 | 0.00 | 0.00 |
| B | 5223 | Graphic arts technicians | 1,123 | 257 | 0.9% | 15.00 | 23.08 | 58.65 |
| B | 5224 | Broadcast technicians | 126 | 45 | 1.9% | 0.00 | 0.00 | 0.00 |
| B | 5225 | Audio and video recording technicians | 2,832 | 1,409 | 1.3% | 14.00 | 28.15 | 48.38 |
| B | 5226 | Other technical and co-ordinating occupations in motion pictures, broadcasting and the performing arts | 3,757 | 2,050 | 1.8% | 15.00 | 28.00 | 40.00 |
| B | 5241 | Graphic designers and illustrators | 11,210 | 4,719 | 2.1% | 15.87 | 24.50 | 40.87 |
| B | 7202 | Contractors and supervisors, electrical trades and telecommunications occupations | 3,235 | 1,144 | 3.2% | 28.00 | 37.20 | 48.56 |

WORKBC LABOUR MARKET OUTLOOK PROFILE

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|----------------------------|------|--|---------------|---------------|------|-------|-------|-------|
| B | 7245 | Telecommunications line and cable workers | 1,347 | 300 | 2.3% | 18.00 | 30.00 | 33.65 |
| B | 7246 | Telecommunications installation and repair workers | 2,879 | 966 | 3.3% | 20.00 | 30.00 | 40.38 |
| B | 7247 | Cable television service and maintenance technicians | 136 | 35 | 3.0% | 26.00 | 28.00 | 45.00 |
| Total Skill Level B | | | 87,321 | 31,407 | - | - | - | - |

- *These are occupations employed in the industry.*
- *Skill level: the five skill level categories used by the 2016 National Occupational Classification (NOC). Note that these are the minimum education requirements as determined by Employment and Social Development Canada. Actual competitive requirements or training opportunities may be at a higher level. For example, in B.C., Construction Craft Worker is a Red Seal trade and there is a Certificate of Qualification for Heavy Equipment Operators.*
- *Occupation: the occupation title at the 4-digit NOC level.*
- *Wage rate: the 2019 hourly wage rate unless otherwise noted. The data source for wages is Employment and Social Development Canada's Job Bank.*
- *High demand occupations: the High Demand Occupations in the B.C. Labour Market Outlook 2019 Edition.*

3. Industries

3.1 Key indicators for the occupation group, B.C.

| Industry | Employment 2019 | Industry Share of Occupation Group | Share of Occupation Group within the Industry | Employment Growth 2019-2024 | Employment Growth 2024-2029 | Job Openings 2019-2029 |
|---|-----------------|------------------------------------|---|-----------------------------|-----------------------------|------------------------|
| All industries | 195,349 | 50.0% | 7.7% | 1.3% | 1.4% | 74,393 |
| Farms | 618 | 0.2% | 2.7% | 1.1% | 0.1% | 152 |
| Forestry and logging | 852 | 0.2% | 7.2% | -1.0% | -1.9% | 46 |
| Fishing, hunting and trapping | 91 | 0.0% | 3.4% | -0.9% | -0.5% | 12 |
| Support activities for agriculture and forestry | 1,731 | 0.4% | 20.6% | -0.2% | -0.3% | 267 |
| Oil and gas extraction | 479 | 0.1% | 11.4% | 4.1% | 2.0% | 317 |
| Mining | 1,984 | 0.5% | 12.0% | 0.3% | -0.7% | 401 |
| Support activities for mining and oil and gas extraction | 954 | 0.2% | 12.0% | 4.4% | 0.8% | 546 |
| Utilities | 3,545 | 0.9% | 26.2% | 0.6% | -0.1% | 910 |
| Construction | 13,382 | 3.4% | 5.6% | 0.4% | 0.2% | 3,888 |
| Food, beverage and tobacco manufacturing | 1,228 | 0.3% | 3.4% | 0.5% | 0.9% | 367 |
| Wood product manufacturing | 866 | 0.2% | 3.5% | -0.4% | -1.3% | 103 |
| Paper manufacturing | 954 | 0.2% | 10.7% | -1.1% | -2.2% | 22 |
| Primary metal manufacturing | 455 | 0.1% | 9.9% | -2.4% | 0.4% | 38 |
| Fabricated metal product manufacturing | 620 | 0.2% | 4.6% | 0.6% | -0.2% | 160 |
| Machinery manufacturing | 1,232 | 0.3% | 14.1% | 0.6% | -0.2% | 293 |
| Ship and boat building | 548 | 0.1% | 12.3% | 1.8% | 0.1% | 188 |
| Transportation equipment manufacturing (excluding shipbuilding) | 1,117 | 0.3% | 15.7% | -0.4% | -0.2% | 207 |
| Other manufacturing | 9,216 | 2.4% | 13.8% | 0.6% | -0.1% | 2,280 |
| Wholesale trade | 5,454 | 1.4% | 6.5% | 1.3% | 0.7% | 1,834 |

WORKBC LABOUR MARKET OUTLOOK PROFILE

| Industry | Employment 2019 | Industry Share of Occupation Group | Share of Occupation Group within the Industry | Employment Growth 2019-2024 | Employment Growth 2024-2029 | Job Openings 2019-2029 |
|---|-----------------|------------------------------------|---|-----------------------------|-----------------------------|------------------------|
| Motor vehicle and parts dealers | 344 | 0.1% | 1.0% | 1.4% | 1.2% | 134 |
| Health and personal care stores | 449 | 0.1% | 1.9% | 0.4% | 0.1% | 106 |
| Other retail trade (excluding cars and personal care) | 4,931 | 1.3% | 2.2% | 1.0% | 0.7% | 1,542 |
| Air transportation | 405 | 0.1% | 3.1% | 1.2% | 0.6% | 134 |
| Rail transportation | 149 | 0.0% | 2.6% | 0.2% | 0.8% | 45 |
| Water transportation | 367 | 0.1% | 5.4% | 0.3% | 0.5% | 114 |
| Truck transportation | 348 | 0.1% | 0.9% | 1.5% | 1.0% | 138 |
| Support activities for transportation | 1,285 | 0.3% | 5.3% | 1.3% | 1.0% | 477 |
| Postal service, couriers and messengers | 173 | 0.0% | 1.1% | 0.0% | 0.9% | 43 |
| Transit, sightseeing, and pipeline transportation | 828 | 0.2% | 3.5% | 1.9% | 1.3% | 361 |
| Warehousing and storage | 320 | 0.1% | 3.2% | 0.6% | 0.9% | 100 |
| Publishing industries | 5,782 | 1.5% | 41.1% | -0.4% | 0.3% | 1,063 |
| Motion picture and sound recording industries | 8,191 | 2.1% | 35.9% | 3.7% | 3.6% | 5,345 |
| Telecommunications | 8,226 | 2.1% | 48.5% | -0.2% | -0.4% | 1,908 |
| Broadcasting, data processing, and information | 1,456 | 0.4% | 18.3% | 1.7% | 0.4% | 468 |
| Finance | 3,188 | 0.8% | 4.9% | 0.7% | 0.5% | 917 |
| Insurance carriers and related activities | 1,686 | 0.4% | 5.5% | 0.9% | 0.4% | 502 |
| Real estate rental and leasing | 801 | 0.2% | 1.4% | 0.2% | 0.5% | 214 |
| Architectural, engineering and related services | 21,604 | 5.5% | 50.5% | 1.8% | 1.7% | 9,787 |
| Computer systems design and related services | 37,993 | 9.7% | 70.7% | 1.7% | 3.7% | 20,355 |
| Management, scientific and technical consulting services | 5,835 | 1.5% | 22.4% | 1.7% | 1.6% | 2,397 |
| Legal, accounting, design, research, and advertising services | 10,947 | 2.8% | 12.4% | 2.2% | 1.3% | 4,628 |
| Business, building and other support services | 5,815 | 1.5% | 5.4% | 1.3% | 1.0% | 1,933 |
| Elementary and secondary schools | 937 | 0.2% | 1.0% | 0.7% | 1.1% | 316 |
| Community colleges | 897 | 0.2% | 7.4% | 0.4% | 0.1% | 212 |
| Universities | 3,319 | 0.8% | 9.2% | 0.9% | 0.2% | 966 |
| Private and trades education | 922 | 0.2% | 2.7% | 1.6% | 1.3% | 363 |
| Ambulatory health care services | 1,851 | 0.5% | 1.9% | 1.9% | 1.8% | 836 |
| Hospitals | 2,369 | 0.6% | 2.1% | 1.0% | 1.2% | 877 |
| Nursing and residential care facilities | 141 | 0.0% | 0.3% | 3.8% | 3.7% | 102 |
| Social assistance | 522 | 0.1% | 0.8% | 1.2% | 1.3% | 194 |
| Performing arts, spectator sports and related industries | 1,155 | 0.3% | 5.1% | 0.3% | 0.7% | 289 |
| Amusement, gambling and recreation industries | 1,398 | 0.4% | 3.1% | 2.4% | 2.0% | 654 |
| Heritage institutions | 507 | 0.1% | 13.0% | 1.3% | 1.3% | 179 |
| Accommodation services | 317 | 0.1% | 1.0% | 1.5% | 1.4% | 127 |
| Food services and drinking places | 282 | 0.1% | 0.2% | 1.7% | 1.5% | 116 |
| Repair, personal and non-profit services | 3,423 | 0.9% | 2.9% | 1.2% | 0.7% | 1,155 |

WORKBC LABOUR MARKET OUTLOOK PROFILE

| Industry | Employment 2019 | Industry Share of Occupation Group | Share of Occupation Group within the Industry | Employment Growth 2019-2024 | Employment Growth 2024-2029 | Job Openings 2019-2029 |
|--|-----------------|------------------------------------|---|-----------------------------|-----------------------------|------------------------|
| Federal government public administration | 3,416 | 0.9% | 10.0% | 0.2% | 0.0% | 804 |
| Provincial and territorial public administration | 4,110 | 1.1% | 13.4% | 0.5% | 0.5% | 1,246 |

Source

Ministry of Advanced Education, Skills and Training. British Columbia 2019 Labour Market Outlook forecast.