



Pathways to *Employment* *in Mining*

2014



Acknowledgements

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**EMPLOYMENT
ONTARIO**

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The 66 NOC Codes In the Mining Industry

Industry Definition and Scope

MiHR (Mining Industry Human Resources Council) defines the mining industry as including all phases of the mining cycle: exploration, development, extraction, processing, reclamation, and closure, care and maintenance.

Statistics Canada is a primary source of data for MiHR forecasts and LMI analysis. Two coding systems are used by Statistics Canada—the North American Industry Classification System (NAICS) describes industry sectors, and the National Occupational Classification (NOC) describes occupations. MiHR uses a selection of eight NAICS codes and 66 NOC codes to define the sector.

NOC Codes

MiHR uses the following National Occupational Classification (NOC) codes to describe the occupational profile of mining. This profile captures essential occupations and positions that are more generally found in other sectors are captured in MiHR analysis as “other occupations”.

NOC Code	Description
0111	Financial Managers
0112	Human Resources Managers
0211	Engineering Managers
0711	Construction Managers
0811	Primary Production Managers (Except Agriculture)
1111	Financial Auditors and Accountants
1112	Financial and Investment Analysts
1121	Specialists In Human Resources
1241	Secretaries (Except Legal And Medical)
1441	Administrative Clerks
1473	Production Clerks
1475	Dispatchers and Radio Operators
1476	Transportation Route and Crew Schedulers
2112	Chemists
2113	Geologists, Geochemists and Geophysicists
2115	Other Professional Occupations In Physical Sciences
2121	Biologists and Related Scientists
2131	Civil Engineers
2132	Mechanical Engineers
2133	Electrical and Electronics Engineers
2134	Chemical Engineers
2141	Industrial and Manufacturing Engineers
2142	Metallurgical and Materials Engineers
2143	Mining Engineers
2144	Geological Engineers
2148	Other Professional Engineers.
2154	Land Surveyors
2211	Chemical Technologists and Technicians

<i>NOC Code</i>	<i>Description</i>
2212	Geological and Mineral Technologists and Technicians
2221	Biological Technologists and Technicians
2231	Civil Engineering Technologists and Technicians
2232	Mechanical Engineering Technologists and Technicians
2233	Industrial Engineering and Manufacturing Technologists and Technicians
2234	Construction Estimators
2241	Electrical And Electronics Engineering Technologists and Technicians
2253	Drafting Technologists and Technicians
2254	Land Survey Technologists and Technicians
2255	Mapping and Related Technologists and Technicians
2262	Engineering Inspectors and Regulatory Officers
2263	Inspectors In Public and Environmental Health and Occupational Health and Safety
6242	Cooks
7213	Contractors and Supervisors, Pipefitting Trades
7216	Contractors and Supervisors, Mechanic Trades
7251	Plumbers
7252	Steamfitters, Pipefitters and Sprinkler System Installers
7271	Carpenters
7242	Industrial Electricians
7265	Welders and Related Machine Operators
7311	Construction Millwrights and Industrial Mechanics (Except Textile)
7312	Heavy-Duty Equipment Mechanics
7421	Heavy Equipment Operators (Except Crane)
7371	Crane Operators
7372	Drillers and Blasters - Surface Mining, Quarrying and Construction
7411	Truck Drivers
7452	Material Handlers
7611	Construction Trades Helpers and Workers
7612	Other Trades Helpers and Workers
8221	Supervisors, Mining and Quarrying
8231	Underground Production and Development Miners
8411	Underground Mine Service and Support Workers
8614	Mine Workers
9211	Supervisors, Mineral and Metal Processing
9231	Central Control and Process Operators, Mineral and Metal Processing
9411	Machine Operators, Mineral and Metal Processing
9415	Inspectors and Testers, Mineral and Metal Processing
9611	Workers In Mineral and Metal Processing

The Mining Industry High Priority Occupations and Pathways

Human Resources and Financial Occupations

Occupations found in this category are necessary to the success of any organization and business. They are necessary components of the mining industry and all other industries in this region, there is some demand for this workforce.

- 0111 Financial Managers
- 0112 Human Resources Managers
- 1111 Financial Auditors And Accountants
- 1112 Financial and Investment Analysts
- 1121 Specialists in Human Resources



Financial Managers

NOC 0111

Financial Managers plan, organize, direct, control and evaluate the operation of financial and accounting departments. They develop and implement the financial policies and systems of establishments. Financial managers establish performance standards and prepare various financial reports for senior management. They are employed in financial and accounting departments in companies throughout the private sector and in government.

Example Titles

- Controller – Financial Services
- Director – Financial Services
- Director of Accounting / Finance Director
- Financial Administrator / Manager, Financial Control
- Manager, Financial Planning and Analysis
- Manager, Internal Audit Services / Treasurer

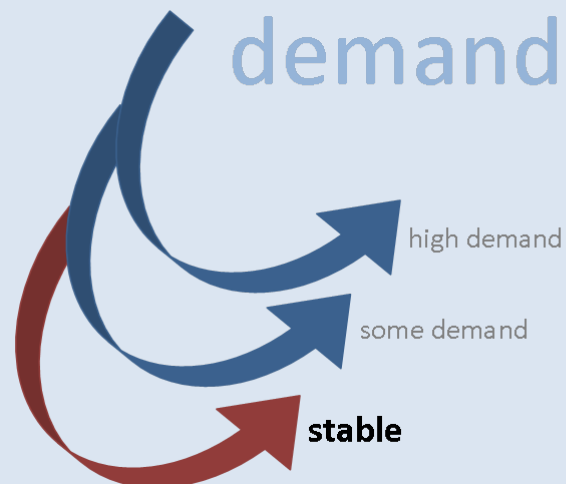
Employment Requirements

- A bachelor's degree in business administration, economics, commerce or a related field is required.
- A master's degree in business administration (concentration in finance), or another master's level management program may be required.
- Several years of experience in accounting, auditing, budgeting, financial planning and analysis or other financial activities are required.
- Accounting and audit managers may require a recognized accounting designation (CA, CMA or CGA).

Related College & University Programs

- Accounting and Computer Applications
- Accounting and Payroll Administrator
- Applied Business Technology
- Banking and Financial Services
- Business Administration

EARNINGS 43,000-133,000



Human Resources Managers

NOC 0112

Human resources managers plan, organize, direct, control and evaluate the operations of human resources and personnel departments, and develop and implement policies, programs and procedures regarding human resource planning, recruitment, collective bargaining, training and development, occupation classification and pay and benefit administration. They represent management and participate actively on various joint committees to maintain ongoing relations between management and employees. Human resources managers are employed throughout the private and public sectors.

Example Titles

- Administrator, Human Resources / Manager, Employer-Employee Relations
- Manager, Employment Equity – Human Resources
- Manager, Human Resources / Manager, Industrial Relations
- Manager, Occupational Health And Safety / Manager, Pay and Benefits
- Manager, Personnel / Manager, Personnel Services
- Manager, Personnel Training And Development
- Manager, Recruiting / Manager, Staff Relations

Employment Requirements

A bachelor's degree in a field related to personnel management, such as business administration, industrial relations, commerce or psychology or completion of a professional development program in personnel administration is required.

Several years of experience as a personnel officer or human resource specialist are required.

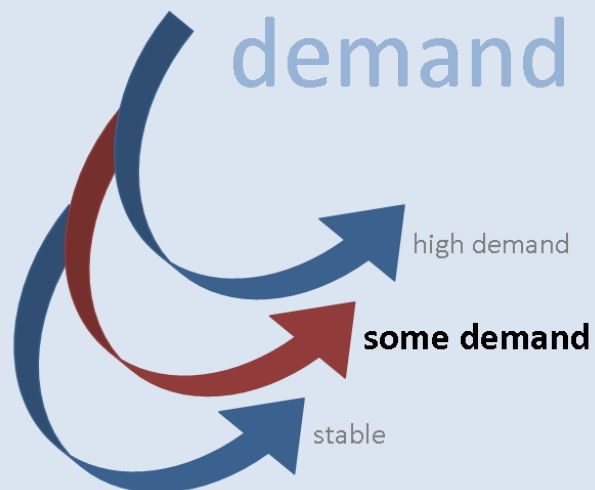
Related College & University Programs

- Human Resources Management (Certificate, diploma, undergraduate, postgraduate)
- Labour and Industrial Relations
- Labour Studies
- Corporate Communications
- Business Administration

EARNINGS: 41,000-133,000

\$ 140,000.00
\$ 130,000.00
\$ 120,000.00
\$ 110,000.00
\$ 100,000.00
\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00
\$ 10,000.00

earnings



Financial Auditors and Accountants

NOC 1111

Financial auditors examine and analyze the accounting and financial records of individuals and establishments to ensure accuracy and compliance with established accounting standards and procedures. Accountants plan, organize and administer accounting systems for individuals and establishments. Articling students in accounting firms are included in this unit group. Financial auditors and accountants are employed by auditing and accounting firms throughout the private and public sectors, or they may be self-employed.

Example Titles

Accountant / Certified General Accountant (CGA)
Certified Management Accountant (CMA)
Chartered Accountant (CA) / Chief Accountant
Financial Auditor / Income Tax Expert
Industrial Accountant

Employment Requirements

Chartered accountants require a university degree and Completion of a professional training program approved by a provincial institute of chartered accountants and, on-the-job training & Membership in a provincial Institute of Chartered Accountants upon successful completion of the Uniform Evaluation (UFE).

Certified general accountants and certified management accountants require a university degree & Completion of a training program approved by the Society of Certified General Accountants or Society of Management Accountants and several years of on-the-job training & Certification by the Certified General Accountants Association or the Society of Management Accountants.

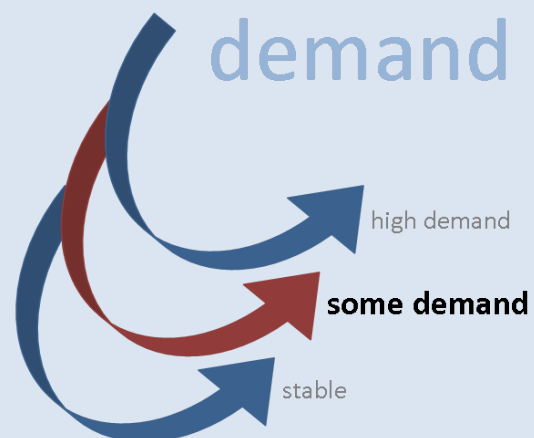
Auditors require education, training and recognition as indicated for chartered accountants, certified general accountants or certified management accountants & some experience as an accountant.

Licensing by the provincial or territorial governing body is usually required for accountants and auditors practising public accounting.

Related College & University Programs

Accounting (Undergraduate, postgraduate)
Finance (Undergraduate, postgraduate)
Economics
Commerce/ Business Administration

EARNINGS 33,000-112,000



Financial and Investment Analysts

NOC 1112

Financial and investment analysts collect and analyze financial information such as economic forecasts, trading volumes and the movement of capital, financial backgrounds of companies, historical performances and future trends of stocks, bonds and other investment instruments to provide financial and investment or financing advice for their company or their company's clients. Their studies and evaluations cover areas such as takeover bids, private placements, mergers or acquisitions. Financial analysts are employed by a wide range of establishments throughout the private and public sector, such as banks, brokerage houses, insurance companies, investment companies, manufacturing firms, trust companies, utility companies and underwriting firms. Investment analysts are employed primarily by brokerage houses and fund management companies.

Example Titles

Chartered Financial Analyst / Financial Analyst
Investment Analyst / Money Market Analyst
Portfolio Manager / Research Associate, Financial Services

Employment Requirements

A bachelor's degree in commerce, business administration or economics and on-the-job training and industry courses and programs are usually required.

A master's degree in business administration (MBA) (concentration in finance) or in finance may be required.

The Chartered Financial Analyst (CFA) designation, available through a program conducted by the Institute of Chartered Financial Analysts in the United States, may be required by some employers.

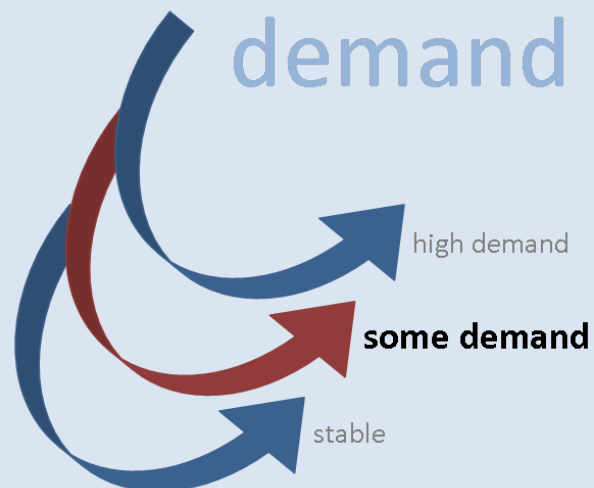
Related College & University Programs

Economics
Commerce
Business Administration (Undergraduate, postgraduate)
Finance (Undergraduate, postgraduate)
Accounting (Undergraduate, postgraduate)

EARNINGS: 30,000-100,000

\$ 120,000.00
\$ 110,000.00
\$ 100,000.00
\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00

earnings



Human Resources Professionals

NOC 1121

Human resources professionals develop, implement and evaluate human resources and labour relations policies, programs and procedures and advise managers and employers on human resources matters. Human resources professionals are employed throughout the private and public sectors, or they may be self-employed.

Example Titles

Business Agent, Labour Organization
Classification Officer – Human Resources
Classification Specialist
Compensation Research Analyst
Conciliator / Consultant, Human Resources
Employee Relations Officer / Employment Equity Officer
Human Resources Research Officer
Job Analyst / Labour Relations Officer
Mediator / Union Representative
Wage Analyst

Employment Requirements

A university degree or college diploma in human resources management or a related field, such as business administration, industrial relations, commerce or psychology or Completion of a professional development program in human resources administration is required.

Some employers may require human resources professionals to hold a Certified Human Resources Professional (CHRP) designation.

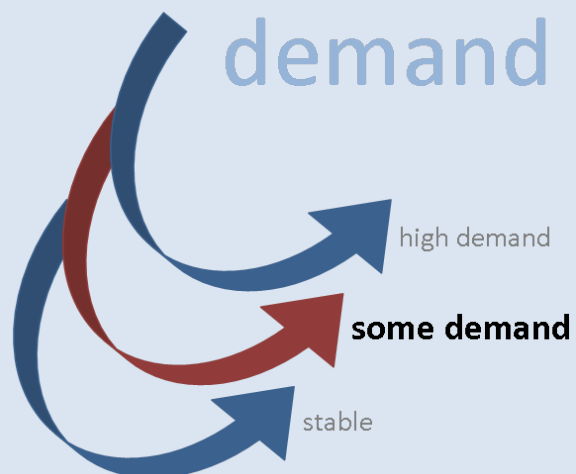
Related College & University Programs

Human Resources Management (Certificate, Diploma, Undergraduate, Postgraduate)
Business Administration
Payroll
Labour Relations

EARNINGS: 30,000-85,000

\$ 110,000.00
\$ 100,000.00
\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00
\$ 10,000.00

earnings



Support Workers

In the Northwest economic region, the labour force for support workers is large but declining across the province. As computerized technology is increasingly used in offices and as companies continue to consolidate administrative functions, job openings will arise from worker turnover and retirements. Employment prospects will be more favourable for persons with strong administrative skills and the ability to use up-to-date computer applications.

1241	Administrative Assistants
1441	Administrative Clerks
1473	Production Clerks
7611	Construction Trades Helpers and Workers
7612	Other Trades Helpers and Workers



Administrative Assistants

NOC 1241

Administrative assistants perform a variety of administrative duties in support of managerial and professional employers. They are employed throughout the private and public sectors.

Example Titles

- Administrative Assistant
- Executive Secretary (Except Legal and Medical)
- Office Administrative Assistant
- Private Secretary
- Secretary (Except Legal and Medical)
- Technical Secretary

Employment Requirements

Completion of secondary school is usually required.

Completion of a one- or two-year college or other program for administrative assistants or secretaries or previous clerical experience is required.

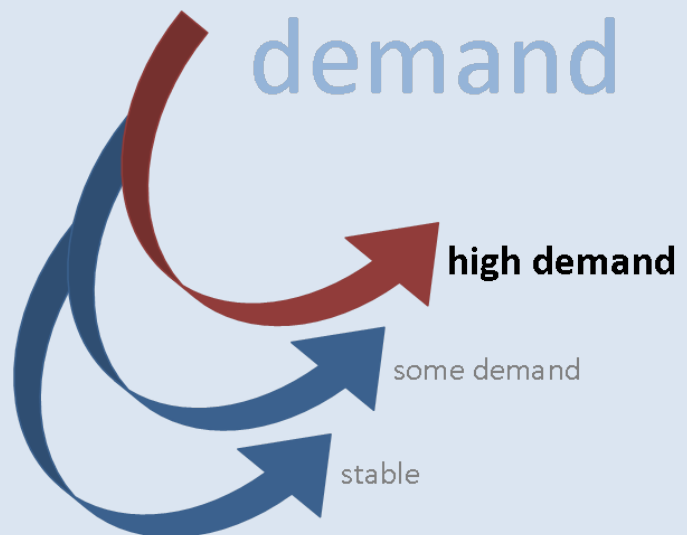
Related College & University Programs

Administrative Assistant (Certificate, diploma)

EARNINGS: 20,000-75,000

- \$ 110,000.00
- \$ 100,000.00
- \$ 90,000.00
- \$ 80,000.00
- \$ 70,000.00
- \$ 60,000.00
- \$ 50,000.00
- \$ 40,000.00
- \$ 30,000.00
- \$ 20,000.00
- \$ 10,000.00

earnings



General Office Support Workers / Administrative Clerks

NOC 1441

Administrative clerks compile, verify, record and process forms and documents, such as applications, licences, permits, contracts, registrations and requisitions, in accordance with established procedures, guidelines and schedules. They are employed throughout the private and public sectors.

Example Titles

Administrative Clerk
Application Clerk
Authorization Clerk
By-Law Clerk
Customs Clerk
Documentation Clerk
Import Clerk
Licence Clerk
Office Administration Clerk
Passport Clerk
Registration Clerk
Registry Clerk
Ward Clerk – Hospital
Warranty Clerk

Employment Requirements

Completion of secondary school is usually required.

Completion of college or other courses in business administration is usually required.

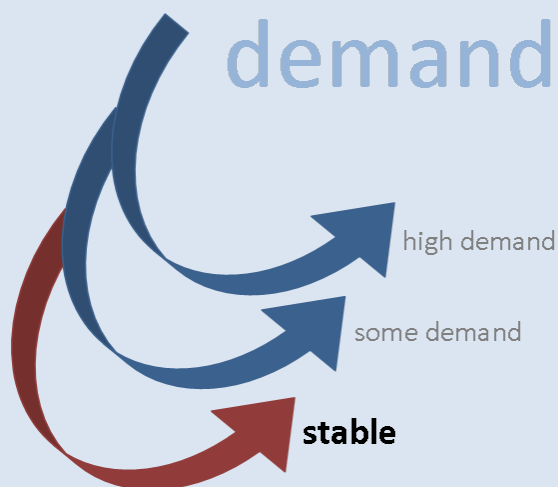
Related College & University Programs

Administrative Assistant (Certificate, diploma)

EARNINGS: 20,000-58,000

\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00
\$ 10,000.00

earnings



Production Logistics Coordinators / Production Clerk

NOC 1473

Production logistics Coordinators co-ordinate and expedite the flow of work and materials within an establishment, prepare work and production schedules and monitor the progress of production and construction projects. Production clerks are employed by manufacturing and construction companies, printing and publishing companies and other industrial establishments.

Example Titles

- Expediter
- Material Estimator
- Production Clerk
- Production Co-Ordinator
- Production Scheduler
- Scheduling Clerk
- Supply Chain Co-Ordinator – Production
- Traffic Control Clerk

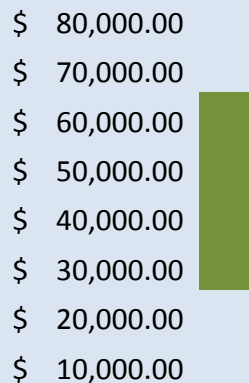
Employment Requirements

Completion of secondary school is usually required and college may be required.
Previous clerical experience or experience as a production worker may be required.

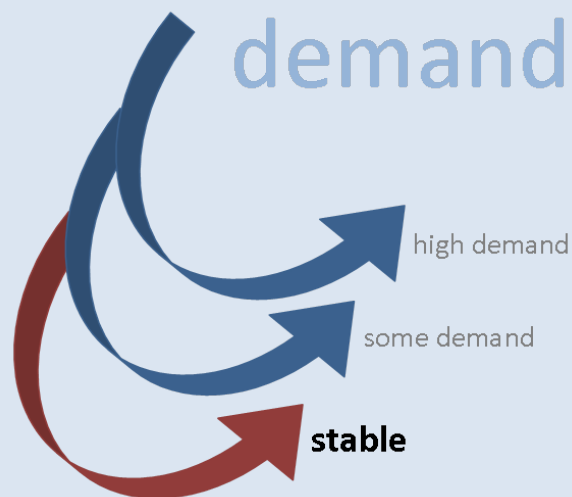
Related College & University Programs

Office Administration

EARNINGS: 28,000 – 59,000



earnings



Construction Trades Helpers and Labourers

NOC 7611

Construction trades helpers and labourers assist skilled tradespersons and perform labouring activities at construction sites, in quarries and in surface mines. They are employed by construction companies, trade and labour contractors, and surface mine and quarry operators.

Example Titles

- Asphalt Spreader / Bricklayer Helper
- Carpenter Helper / Concrete Mixer Helper
- Construction Helper / Construction Labourer
- Demolition Worker / Driller Helper – Surface Mining
- Drywall Sander
- Flagman/Woman
- Glazier Helper
- Labourer, Concrete Paving / Labourer, Excavation
- Pipeline Mandrel Operator
- Plumber Helper / Roofer Helper
- Stabber – Pipeline Construction

Employment Requirements

Some experience as a general construction labourer may be required for construction trade helpers.

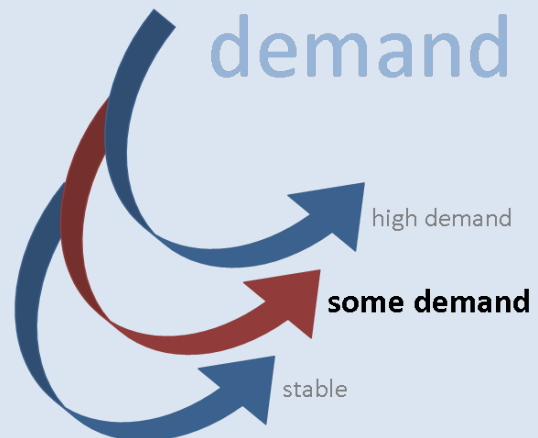
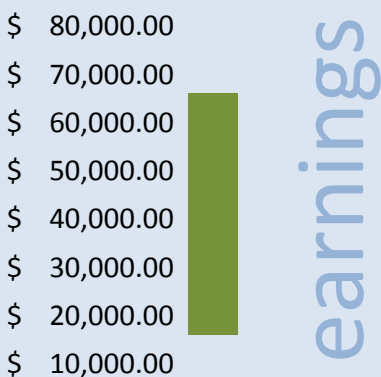
Some pipeline workers, such as stabbers, mandrel operators and pre-heater tenders, usually require one season of experience in oil and gas pipeline construction.

Flagmen/women may require a traffic control certificate.

Related College & University Programs

- Pre-Trades Training
- Heavy Equipment Technician
- Machinery Technician
- Apprenticeship Trades programs
- Civil Engineering
- Building Construction (Certificate, diploma, undergraduate, graduate)

EARNINGS: 24,000-52,000



Other Trades Helpers and Labourers

NOC 7612

This unit group includes trade helpers and labourers, not elsewhere classified, who assist skilled tradespersons and perform labouring activities in the installation, maintenance and repair of industrial machinery, refrigeration, heating and air conditioning equipment, in the maintenance and repair of transportation and heavy equipment, in the installation and repair of telecommunication and power cables and in other repair and service work settings. They are employed by a wide variety of manufacturing, utility and service companies.

Example Titles

Aerial Spraying Assistant
Aircraft Mechanic Helper
Cable Installer Helper
Diesel Mechanic Helper
Ground Worker – Telecommunications
Mechanic's Helper – Automotive
Millwright Helper
Refrigeration Mechanic Helper
Splicer Helper – Telecommunications
Surveyor Helper

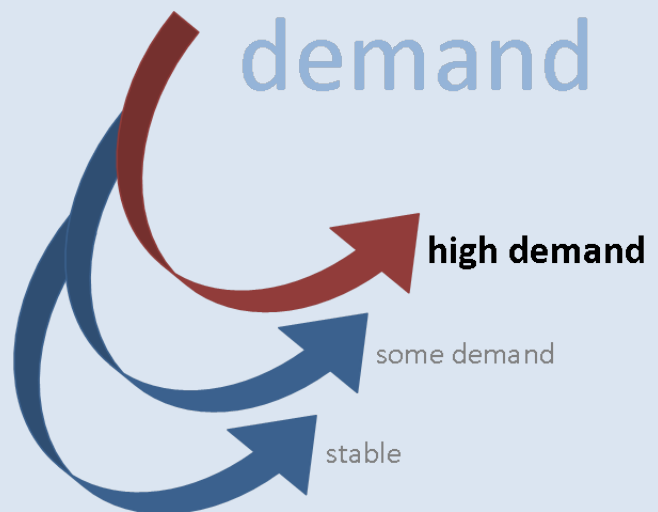
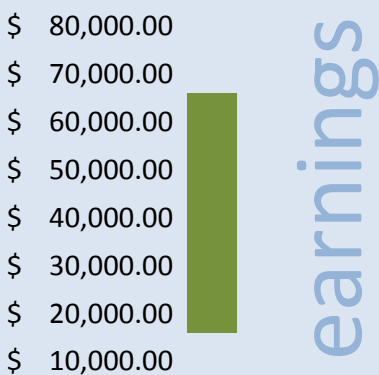
Employment Requirements

Some secondary school education may be required.
On-the-job training is provided.

Related College & University Programs

Heavy Equipment Technician
Pre-Trades Training
Heavy Machine Operator
Motive Power Technician
Mechanical Engineering
Mechanical Techniques

EARNINGS: 27,000-62,000



Professional and Physical Science Occupations

Occupations in this category combine scientific and mathematical education and training. These categories are in high demand in northwestern Ontario.

2112	Chemists
2113	Geologists, Geochemists and Geophysicists
2115	Other Professional Occupations In Physical Sciences
2121	Biologists and Related Scientists
2131	Civil Engineers
2132	Mechanical Engineers
2133	Electrical and Electronics Engineers
2134	Chemical Engineers
2141	Industrial and Manufacturing Engineers
2142	Metallurgical and Materials Engineers
2143	Mining Engineers
2144	Geological Engineers
2148	Other Professional Engineers



Chemists

NOC 2112

Chemists conduct research and analysis in support of industrial operations, product and process development, quality control, environmental control, medical diagnosis and treatment, biotechnology, nanotechnology and other applications. They also conduct theoretical, experimental and applied research into basic chemical and biochemical processes to create or synthesize new products and processes. Chemists are employed in research, development and quality control laboratories; chemical, petrochemical and pharmaceutical industries; mineral, metal and pulp and paper industries; and a wide variety of manufacturing, utility, health, educational and government establishments.

Example Titles

Agricultural Chemist / Analytical Chemist
Bioanalytical Chemist / Biochemist
Clinical Chemist / Coatings Chemist
Electrochemist / Environmental Chemist
Inorganic Chemist / Medicinal Chemist
Nuclear Magnetic Resonance (NMR) Spectroscopist
Oceanographic Chemist / Organic Chemist
Organic Mass Spectrometrists / Organometallic Chemist
Pharmacological Chemist / Physical Chemist
Quality Control Chemist / Research Chemist

Employment Requirements

A bachelor's degree in chemistry, biochemistry or a related discipline is required.

A master's or doctoral degree is usually required for employment as a research chemist.

Licensing by a provincial association of chemists is required in Quebec, and available but voluntary in Nova Scotia, Ontario, Alberta and British Columbia.

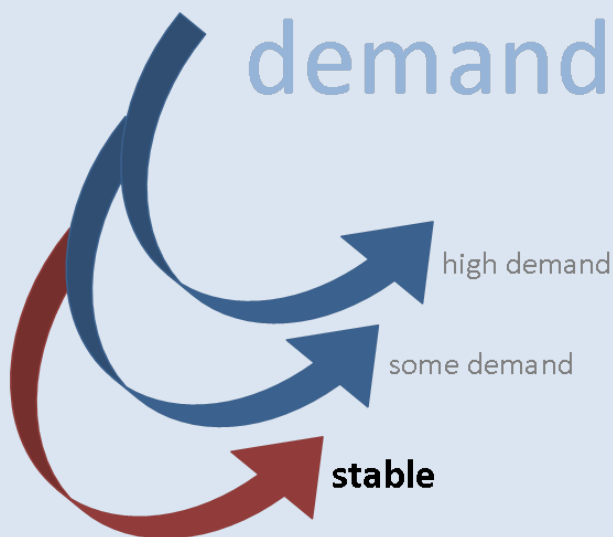
Related College & University Programs

Chemistry (Undergraduate, graduate)
Biological Chemistry (Undergraduate, graduate)

EARNINGS: 35,000-95,000

\$ 110,000.00
\$ 100,000.00
\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00
\$ 10,000.00

earnings



Geologists, Geochemists and Geophysicists

NOC 2113

Geologists, geochemists and geophysicists conduct programs of exploration and research to extend knowledge of the structure, composition and processes of the earth, to locate and identify hydrocarbon, mineral and groundwater resources, to plan and implement programs of hydrocarbon and mineral extraction and to assess and mitigate the effects of development and waste disposal projects on the environment. They are employed by petroleum and mining companies, consulting geology, geophysics and engineering firms and by governments and educational institutions or they may be self-employed.

Example Titles

Development Geologist / Environmental Geologist / Exploration Geologist
Geochemist / Geologist / Geophysicist
Glaciologist / Groundwater Geologist / Hydrogeologist
Hydrologist / Mine Geologist / Mineralogist
Oceanographer / Paleontologist / Petroleum Geologist
Petrologist / Sedimentologist / Seismologist / Stratigrapher.

Employment Requirements

Geoscientists require a university degree in geology, geochemistry, geophysics or a related discipline.

A master's or doctoral degree in geophysics, physics, mathematics or engineering may be required for employment as a geophysicist.

Geologists and geophysicists are eligible for registration following graduation from an accredited educational program and after several years of supervised work experience and, in some provinces, after passing a professional practice examination.

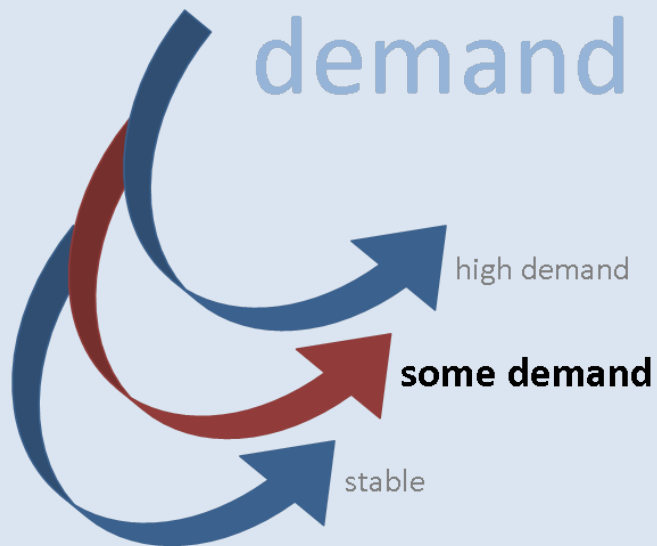
Related College & University Programs

Geology (Undergraduate, graduate)
Chemistry and Earth Sciences (Undergraduate, graduate)
Mining Techniques

EARNINGS: 39,000-95,000

\$ 110,000.00
\$ 100,000.00
\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00
\$ 10,000.00

earnings



Other Professional Occupations in Physical Sciences

NOC 2115

This group includes metallurgists, soil scientists and physical scientists and researchers, not elsewhere classified, involved in the conduct of theoretical and applied research in fields of physical science. They are employed by governments, educational institutions and a wide range of industrial establishments.

Example Titles

Astronaut
Ballistics Examiner
Materials Scientist
Metallurgist
Physical Metallurgist
Research Scientist – Ceramics
Research Scientist – Composite Materials
Soil Scientist

Employment Requirements

A bachelor's degree in metallurgy, physics, chemistry, or a related physical science discipline is required.

A master's or doctoral degree is usually required for employment as a research scientist.

Advanced degrees in a broad range of applied science areas, such as engineering or medicine or licences may be required for some occupations in this unit group.

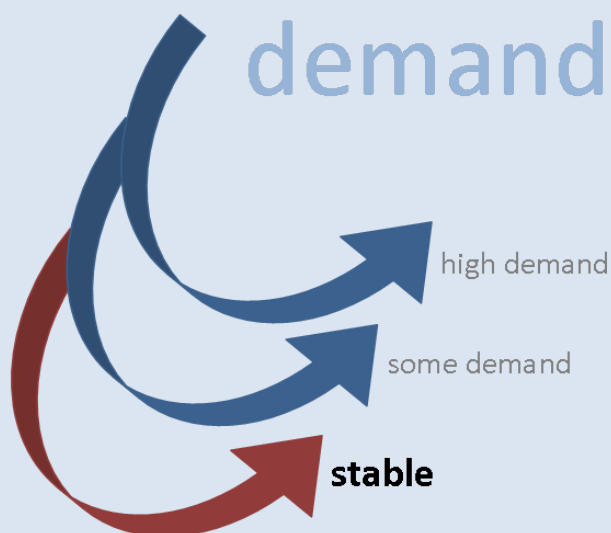
Related College & University Programs

Geological Engineering
Geography and Environmental Studies
Chemical Sciences
Biophysics
Engineering

EARNINGS: 28,000 – 90,000

\$ 100,000.00
\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00
\$ 10,000.00

earnings



Biologists and Related Scientists

NOC 2121

Biologists and related scientists conduct basic and applied research to extend knowledge of living organisms, to manage natural resources, and to develop new practices and products related to medicine and agriculture. They are employed in both laboratory and field settings by governments, environmental consulting companies, resource and utilities companies, chemical, pharmaceutical and biotechnical companies and health and educational institutions.

Example Titles

- Anatomist / Bacteriologist
- Bioinformatician / Biologist
- Botanist / Cell Biologist
- Ecologist / Microbiologist
- Molecular Biologist
- Mycologist / Parasitologist
- Pharmacologist / Physiologist
- Protozoologist / Toxicologist

Employment Requirements

A bachelor's degree in biology or in a related discipline is required for biologists.

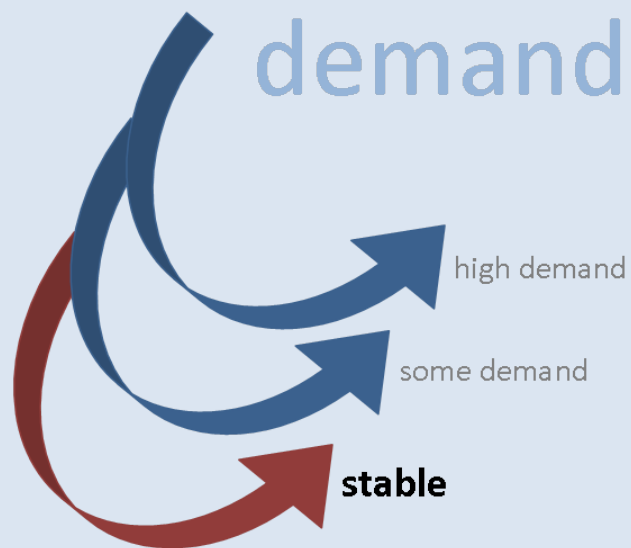
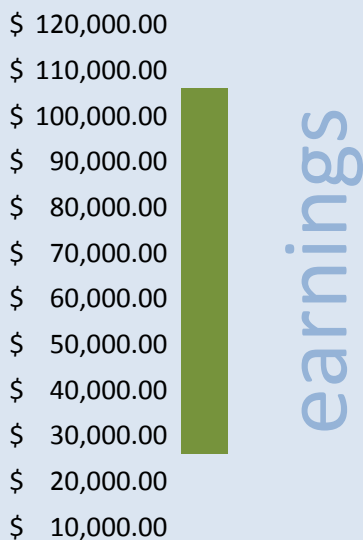
A master's or doctoral degree in biology or a related discipline is required for employment as a research scientist in biology.

Post-doctoral research experience is usually required before employment in academic departments or research institutions.

Related College & University Programs

- Biology
- Chemical Laboratory Technician
- Bioscience

EARNINGS: 27,000-108,000



Civil Engineers

NOC 2131

Civil engineers plan, design, develop and manage projects for the construction or repair of buildings, earth structures, powerhouses, roads, airports, railways, rapid transit facilities, bridges, tunnels, canals, dams, ports and coastal installations and systems related to highway and transportation services, water distribution and sanitation. Civil engineers may also specialize in foundation analysis, building and structural inspection, surveying, geomatics and municipal planning.

Example Titles

Civil Engineer / Construction Engineer / Environmental Engineer
Geodetic Engineer / Geomatics Engineer / Hydraulics Engineer
Project Engineer, Construction / Public Works Engineer / Sanitation Engineer
Structural Engineer / Surveying Engineer / Transportation Engineer / Water Management Engineer

Employment Requirements

A bachelor's degree in civil engineering or in a related engineering discipline is required.

A master's degree or doctorate in a related engineering discipline may be required.

Licensing by a provincial or territorial association of professional engineers is required to approve engineering drawings and reports and to practise as a Professional Engineer (P.Eng.).

Engineers are eligible for registration following graduation from an accredited educational program, and after three or four years of supervised work experience in engineering and passing a professional practice examination.

Leadership in Energy and Environmental Design (LEED) certification is offered by the Canada Green Building Council and may be required by some employers.

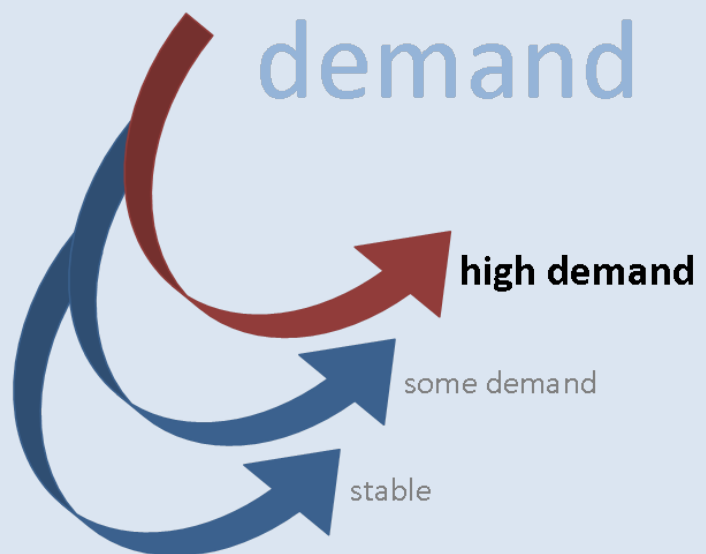
Related College & University Programs

Applied Science and Technology Fundamentals
Civil Engineering, Biophysics, Geology
Pre-Technology

EARNINGS: 40,000-120,000

\$ 140,000.00
\$ 130,000.00
\$ 120,000.00
\$ 110,000.00
\$ 100,000.00
\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00

earnings



Mechanical Engineers

NOC 2132

Mechanical engineers research, design and develop machinery and systems for heating, ventilating and air conditioning, power generation, transportation, processing and manufacturing. They also perform duties related to the evaluation, installation, operation and maintenance of mechanical systems. Mechanical engineers are employed by consulting firms, by power-generating utilities and in a wide range of manufacturing, processing and transportation industries or they may be self-employed.

Example Titles

Acoustics Engineer / Automotive Engineer / Design Engineer – Mechanical
Energy Conservation Engineer / Engineer, Power Generation / Fluid Mechanics Engineer
Heating, Ventilation And Air Conditioning (HVAC) Engineer / Mechanical Engineer
Mechanical Maintenance Engineer / Nuclear Engineer / Piping Engineer / Refrigeration Engineer
Robotics Engineer / Thermal Design Engineer / Tool Engineer

Employment Requirements

A bachelor's degree in mechanical engineering or in a related engineering discipline is required.

A master's degree or doctorate in a related engineering discipline may be required.

Licensing by a provincial or territorial association of professional engineers is required to approve engineering drawings and reports and to practise as a Professional Engineer (P.Eng.).

Engineers are eligible for registration following graduation from an accredited educational program, and after three or four years of supervised work experience in engineering and passing a professional practice examination.

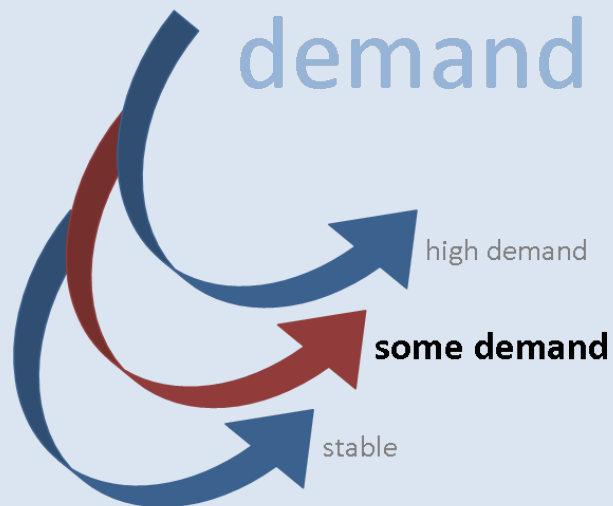
Related College & University Programs

Applied Science and Technology Fundamentals
Civil Engineering, Pre-Technology
Engineering physics, Mechanical Engineering

EARNINGS: 40,000-130,000

\$ 140,000.00
\$ 130,000.00
\$ 120,000.00
\$ 110,000.00
\$ 100,000.00
\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00

earnings



Electrical and Electronics Engineers

NOC 2133

Electrical and electronics engineers design, plan, research, evaluate and test electrical and electronic equipment and systems. They are employed by electrical utilities, communications companies, manufacturers of electrical and electronic equipment, consulting firms, and by a wide range of manufacturing, processing and transportation industries and government.

Example Titles

Avionics Engineer / Control Systems Engineer / Design Engineer, Electrical
Distribution Planning Engineer, Electrical / Electrical Engineer
Electrical Network Engineer / Electronics Engineer / Instrumentation And Control Engineer
Planning Engineer, Electrical Systems / Process Control Engineer, Electrical
Roadway Lighting Design Engineer / Television Systems Engineer / Test Engineer, Electronics

Employment Requirements

A bachelor's degree in electrical or electronics engineering or in an appropriate related engineering discipline is required.

A master's or doctoral degree in a related engineering discipline may be required.

Licensing by a provincial or territorial association of professional engineers is required to approve engineering drawings and reports and to practise as a Professional Engineer (P.Eng.).

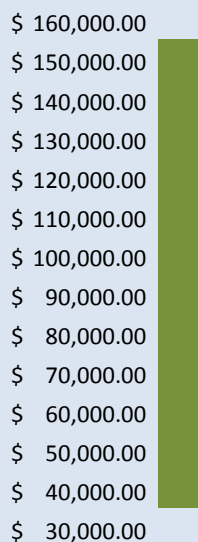
Engineers are eligible for registration following graduation from an accredited educational program, and after three or four years of supervised work experience in engineering and passing a professional practice examination.

Leadership in Energy and Environmental Design (LEED) certification is offered by the Canada Green Building Council and may be required by some employers.

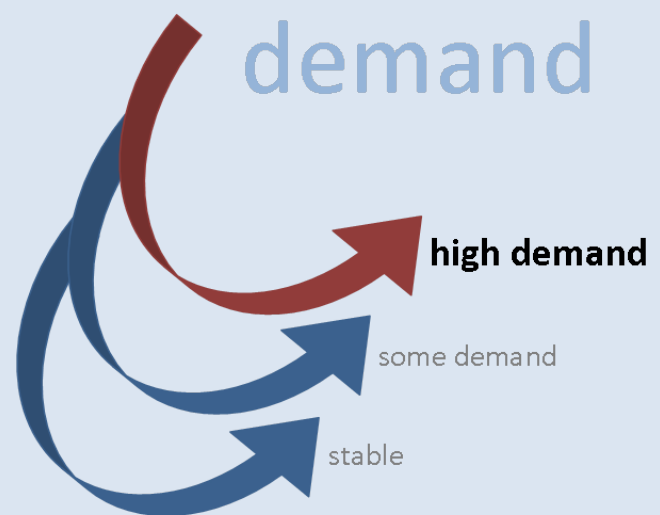
Related College & University Programs

Applied Science and Technology Fundamentals, Civil Engineering
Electrical Engineering, Engineering Physics, Computer Engineering

EARNINGS: 45,000-150,000



earnings



Chemical engineers

NOC 2134

Chemical engineers research, design, and develop chemical processes and equipment, oversee the operation and maintenance of industrial chemical, plastics, pharmaceutical, resource, pulp and paper, and food processing plants and perform duties related to chemical quality control, environmental protection and biochemical or biotechnical engineering. Chemical engineers are employed in a wide range of manufacturing and processing industries, consulting firms, government, research and educational institutions.

Example Titles

Adhesives Engineer / Biochemical Engineer / Biotechnical Engineer
Chemical Engineer, Environmental / Chemical Process Engineer / Industrial Hygiene Engineer
Industrial Waste Treatment Engineer / Liquid Fuels Engineer / Petrochemical Engineer
Polymer Engineer / Process Control Engineer, Chemical / Project Engineer, Chemical
Pulp and Paper Engineer / Refinery Engineer / Waste Treatment Engineer

Employment Requirements

A bachelor's degree in chemical engineering or in a related engineering discipline is required.

A master's degree or doctorate in a related engineering discipline may be required.

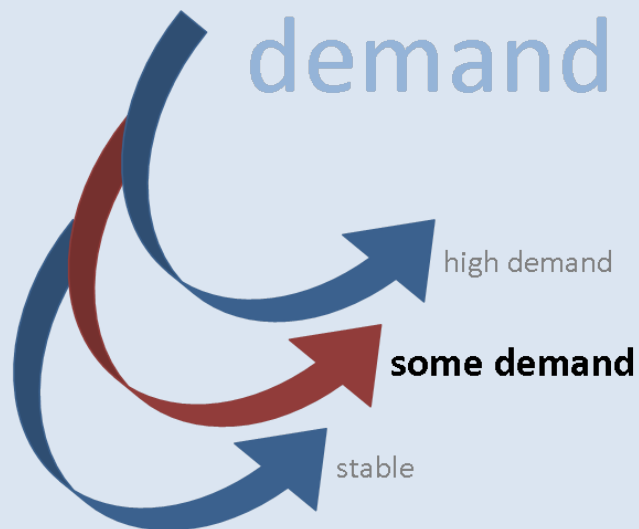
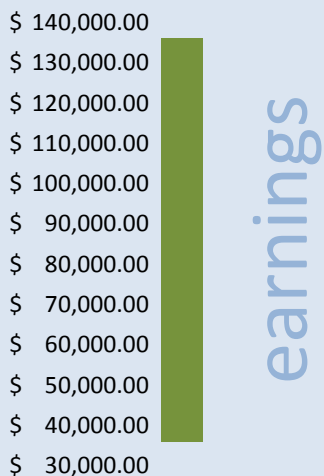
Licensing by a provincial or territorial association of professional engineers is required to approve engineering drawings and reports and to practise as a Professional Engineer (P.Eng.).

Engineers are eligible for registration following graduation from an accredited educational program, and after three or four years of supervised work experience in engineering and passing a professional practice examination.

Related College & University Programs

Applied Science and Technology Fundamentals (College)
Chemical Engineering (Undergraduate, Graduate)
Engineering and Biosciences (Undergraduate, Graduate)
Botany (Undergraduate)
Chemistry (Undergraduate)
Physics (Undergraduate)

EARNINGS: 45,000-130,000



Industrial and Manufacturing Engineers

NOC 2141

Industrial and manufacturing engineers conduct studies, and develop and supervise programs to achieve the best use of equipment, human resources, technology, materials and procedures to enhance efficiency and productivity. Industrial and manufacturing engineers are employed in consulting firms, manufacturing and processing companies, in government, financial, health care and other institutions, or they may be self-employed.

Example Titles

Engineer, Computer Integrated Manufacturing (CIM) / Fire Prevention Engineer
Industrial Engineer / Manufacturing Engineer / Plant Engineer
Production Engineer / Quality Control Engineer / Safety Engineer
Work Measurement Engineer

Employment Requirements

A bachelor's degree in industrial engineering or in a related engineering discipline is required.

A master's degree or doctorate in a related engineering discipline may be required.

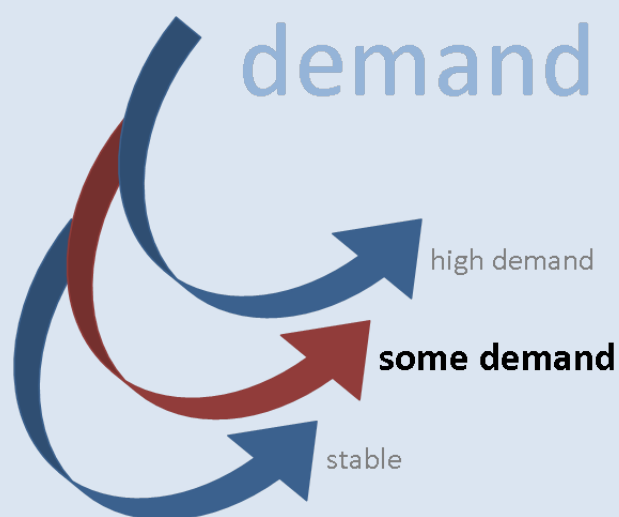
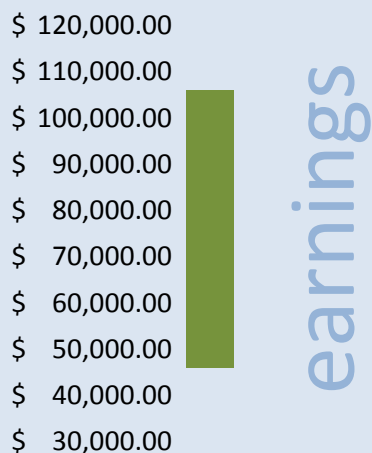
Licensing by a provincial or territorial association of professional engineers is required to approve engineering drawings and reports and to practise as a Professional Engineer (P.Eng.).

Engineers are eligible for registration following graduation from an accredited educational program, and after three or four years of supervised work experience in engineering and passing a professional practice examination.

Related College & University Programs

Industrial Engineering (Undergraduate, graduate)
Mechanical Engineering Technology (Diploma)
Chemical Engineering
Civil Engineering

EARNINGS: 52,000-95,000



Metallurgical and Materials Engineers

NOC 2142

Metallurgical and materials engineers conduct studies of the properties and characteristics of metals and other non-metallic materials and plan, design and develop machinery and processes to concentrate, extract, refine and process metals, alloys and other materials such as ceramics, semiconductors and composite materials. Metallurgical and materials engineers are employed in consulting engineering firms, mining, metal processing and manufacturing companies, and in government, research and educational institutions.

Example Titles

Ceramics Engineer / Corrosion Engineer / Electrometallurgical Engineer
Foundry Engineer / Hydrometallurgical Engineer / Materials Engineer
Metallurgical Engineer / Physical Metallurgical Engineer
Pyrometallurgical Engineer / Welding Engineer

Employment Requirements

A bachelor's degree in metallurgical, materials, ceramic or chemical engineering or in a related engineering discipline is required.

A master's degree or doctorate in a related engineering discipline may be required.

Licensing by a provincial or territorial association of professional engineers is required to approve engineering drawings and reports and to practise as a Professional Engineer (P.Eng.).

Engineers are eligible for registration following graduation from an accredited educational program, and after three or four years of supervised work experience in engineering and passing a professional practice examination.

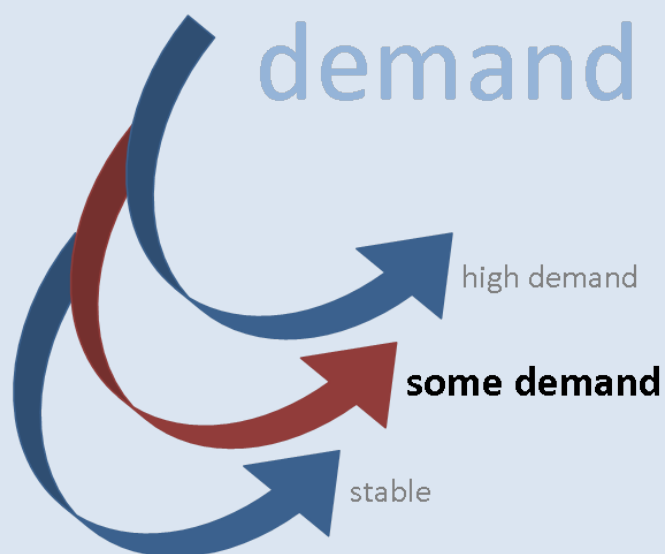
Related College & University Programs

Geological Engineering (College, undergraduate, graduate)
Metals Engineering
Materials Science
Manufacturing Engineering

EARNINGS: 40,000-120,000

\$ 130,000.00
\$ 120,000.00
\$ 110,000.00
\$ 100,000.00
\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00

earnings



Mining Engineers

NOC 2143

Mining engineers plan, design, organize and supervise the development of mines, mine facilities, systems and equipment; and prepare and supervise the extraction of metallic or non-metallic minerals and ores from underground or surface mines. Mining engineers are employed by mining companies, consulting engineering companies, manufacturers, government and in educational and research institutions.

Example Titles

Mine Design Engineer / Mine Development Engineer
Mine Layout Engineer / Mine Production Engineer
Mine Safety Engineer / Mine Ventilation Engineer
Mineral Engineer / Mining Engineer

Employment Requirements

A bachelor's degree in mining engineering or in a related engineering discipline is required.

A master's degree or doctorate in a related engineering discipline may be required.

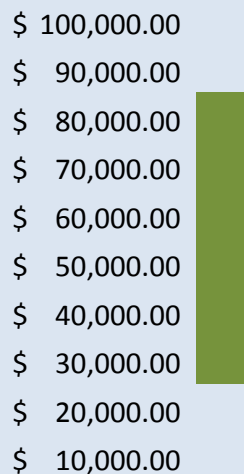
Licensing by a provincial or territorial association of professional engineers is required to approve engineering drawings and reports and to practise as a Professional Engineer (P.Eng.).

Engineers are eligible for registration following graduation from an accredited educational program, and after three or four years of supervised work experience in engineering and passing a professional practice examination.

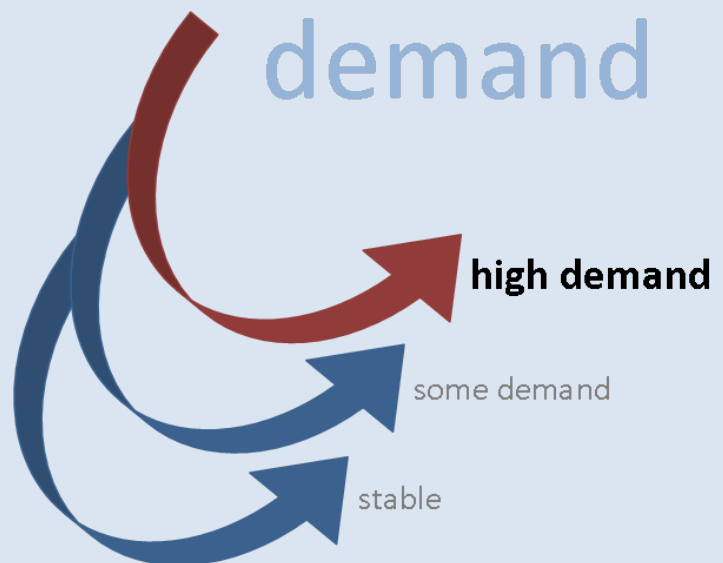
Related College & University Programs

Mining Engineering
Mining Geology
Construction Technician in Mining and Civil Engineering
Natural Resources Engineering
Pre-Trades Technology

EARNINGS: 31,000-74,000



earnings



Geological Engineers

NOC 2144

Geological engineers conduct geological and geotechnical studies to assess suitability of locations for civil engineering, mining and oil and gas projects; and plan, design, develop and supervise programs of geological data acquisition and analysis and the preparation of geological engineering reports and recommendations. Geological engineers are employed in consulting engineering companies, electrical utilities, mining and petroleum companies and in government and research and educational institutions.

Example Titles

- Geological Engineer
- Geophysical Engineer
- Hydrogeological Engineer – Engineering

Employment Requirements

A bachelor's degree in geological engineering or in a related discipline is required.
A master's degree or doctorate in a related engineering discipline may be required.
Licensing by a provincial or territorial association of professional engineers is required to approve engineering drawings and reports and to practise as a Professional Engineer (P.Eng.).
Engineers are eligible for registration following graduation from an accredited educational program, three or four years of supervised work experience in engineering and passing a professional practice examination.

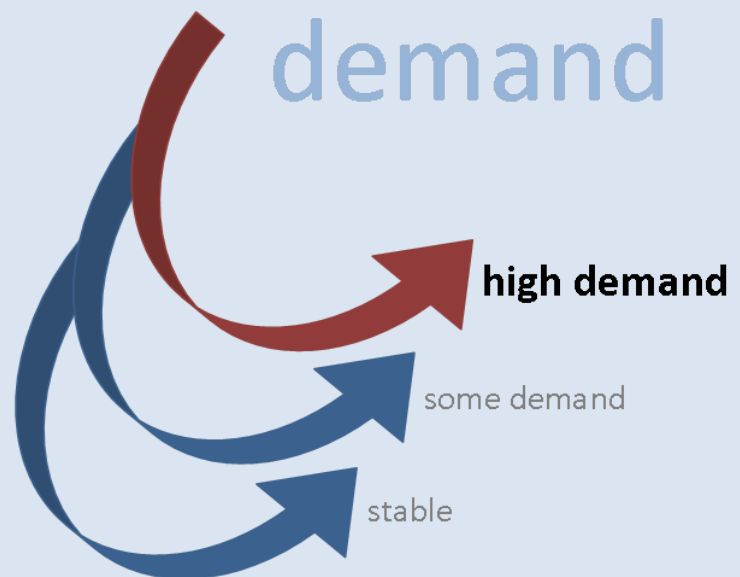
Related College & University Programs

- Geological Engineering
- Physics
- Earth Resources Technician
- Mining Engineering

EARNINGS: 40,000-45,000

- \$ 80,000.00
- \$ 70,000.00
- \$ 60,000.00
- \$ 50,000.00
- \$ 40,000.00
- \$ 30,000.00
- \$ 20,000.00
- \$ 10,000.00

earnings



Other Professional Engineers

NOC 2148

This unit group includes agricultural and bio-resource engineers, biomedical engineers, engineering physicists and engineering scientists, marine and naval engineers, textile engineers and other specialized engineering occupations which are not classified elsewhere.

Example Titles

Agricultural Engineer / Bio-Resource Engineer
Biomedical Engineer / Engineering Physicist
Engineering Scientist / Food Processing Engineer
Marine Engineer / Naval Architect
Textile Engineer

Employment Requirements

A bachelor's degree in an appropriate engineering discipline is required.

A master's degree or doctorate in a related engineering discipline may be required.

Licensing by a provincial or territorial association of professional engineers is required to approve engineering drawings and reports, and to practise as a Professional Engineer (P.Eng.).

Engineers are eligible for registration following graduation from an accredited educational program, and after three or four years of supervised work experience in engineering and passing a professional practice examination.

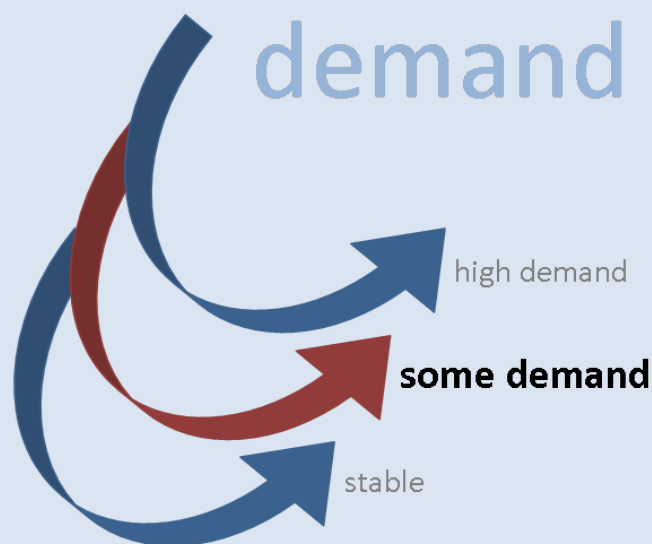
Related College & University Programs

Civil Engineering
Mechanical Engineering
Manufacturing Engineering Technician
Engineering Physics

EARNINGS: 40,000-120,000

\$ 140,000.00
\$ 130,000.00
\$ 120,000.00
\$ 110,000.00
\$ 100,000.00
\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00

earnings



Technical Occupations

In the technical occupation workforce in northwestern Ontario, there is evidence that this segment of the mining workforce lacks workers in the mid-career age (35-45 years), with much of the workforce age being closer to retirement. This may create a challenge for future hiring needs.

2154	Land Surveyors
2211	Chemical Technologists and Technicians
2212	Geological and Mineral Technologists and Technicians
2221	Biological Technologists and Technicians
2231	Civil Engineering Technologists and Technicians
2232	Mechanical Engineering Technologists and Technicians
2233	Industrial Engineering and Manufacturing Technologists and Technicians
2234	Construction Estimators
2241	Electrical and Electronics Engineering Technologists and Technicians
2253	Drafting Technologists and Technicians
2254	Land Survey Technologists and Technicians
2255	Mapping and Related Technologists and Technicians
2262	Engineering Inspectors and Regulatory Officers
2263	Inspectors in Public & Environmental Health & Occupational Health & Safety
9415	Inspectors and Testers, Mineral and Metal Processing



Land Surveyors

NOC 2154

Land surveyors plan, direct and conduct legal surveys to establish the location of real property boundaries, contours and other natural or human-made features, and prepare and maintain cross-sectional drawings, official plans, records and documents pertaining to these surveys. They are employed by federal, provincial and municipal governments, private sector land surveying establishments, real estate development, natural resource, engineering and construction firms, or they may be self-employed.

Example Titles

- Commissioned Land Surveyor
- Land Surveyor
- Legal Surveyor
- Professional Land Surveyor
- Property Surveyor

Employment Requirements

A bachelor's degree in geomatics engineering or survey engineering or A college diploma in survey science or geomatics technology with additional academic credits and successful completion of equivalent examinations set by a regional board of examiners for land surveyors is required.

A one- to three-year articling period is required.

Successful completion of professional land surveyor examinations is required.

A federal or provincial land surveyor's licence is required.

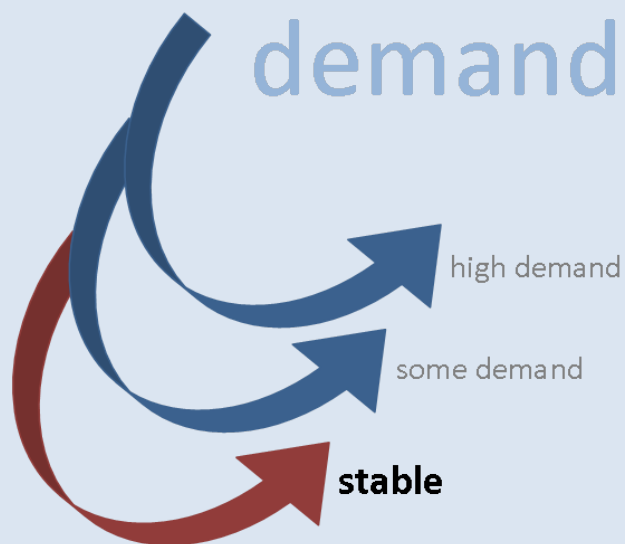
Related College & University Programs

- Geomatics Engineering
- Survey Engineering
- Survey Science
- Geomatics Technology
- Geographic Information Systems (College Diploma)
- Civil Engineering
- Construction Engineering

EARNINGS: 33,000-64,000

- \$ 90,000.00
- \$ 80,000.00
- \$ 70,000.00
- \$ 60,000.00
- \$ 50,000.00
- \$ 40,000.00
- \$ 30,000.00
- \$ 20,000.00
- \$ 10,000.00

earnings



Chemical Technologists and Technicians

NOC 2211

Chemical technologists and technicians 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. They are employed by research and development and quality control laboratories, consulting engineering companies, in chemical, petrochemical, pharmaceutical and a variety of other manufacturing and processing industries, and by utilities, health, educational and government establishments.

Example Titles

Analytical Technician, Chemical / Biochemistry Technologist
Chemical Analyst / Chemical Engineering Technician
Chemical Engineering Technologist / Chemical Laboratory Analyst
Chemical Research Technician / Chemical Technician
Chemical Technologist / Formulation Technician
Geochemical Technician / Pilot Plant Technician
Quality Control Technician – Chemical Processing

Employment Requirements

Chemical technologists usually require completion of a two- or three-year college program in chemical, biochemical or chemical engineering technology or a closely related discipline.

Chemical technicians usually require completion of a one- or two-year college program in chemical, biochemical or chemical engineering technology.

National certification for chemical technologists and technicians is available through the Canadian Society for Chemical Technology.

Certification in chemical engineering technology or in a related field is available through provincial associations of engineering/applied science technologists and technicians and may be required by employers.

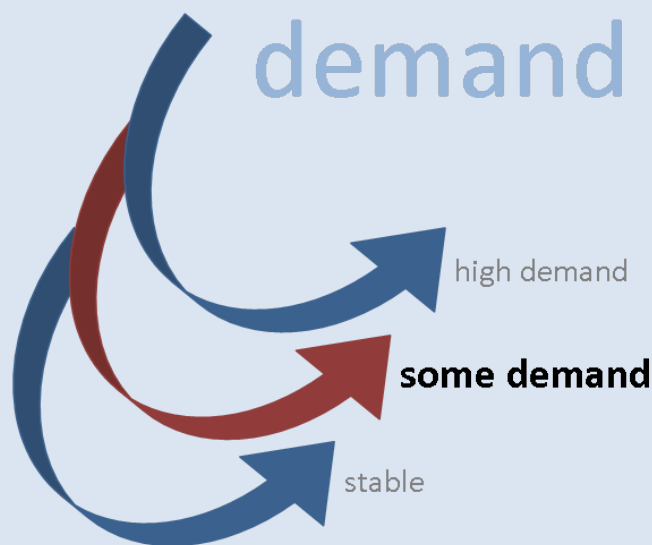
Related College & University Programs

Chemical Engineering
Biochemical Engineering

EARNINGS: 25,000-80,000

\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00
\$ 10,000.00

earnings



Geological and Mineral Technologists and Technicians

NOC 2212

Geological and mineral technologists and technicians 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. They are employed by petroleum and mining companies, consulting geology and engineering firms, and by governments and educational institutions as well as manufacturing, construction and utilities companies.

Example Titles

Assayer / Geological Technician / Geophysical Technologist
Groundwater Technologist / Metallurgical Technologist
Mineralogy Technician / Mining Engineering Technologist
Mining Technologist / Petroleum Engineering Technologist
Petroleum Technician / Petrology Technician
Reservoir Engineering Technician / Rock Mechanics Technician
Seismic Technician / Welding Technologist

Employment Requirements

Geological and mineral technologists usually require a 2-3 year college program in geological technology, petroleum technology, petroleum engineering technology, hydrogeology or groundwater technology, mining technology, mining engineering technology, mineralogy, metallurgical technology, or welding technology.

Geophysics technologists usually require completion of a two- to three-year college program in electronics technology.

Geological and mineral technicians usually require completion of a 1-2-year college program in a related field.

Certification is available through provincial associations of engineering/applied science technologists and technicians and may be required by employers.

Related College & University Programs

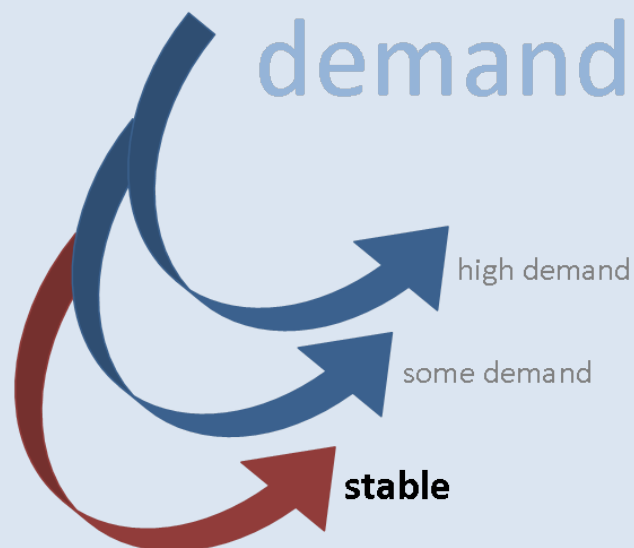
Geological Technology
Electronics Technology
Mining Engineering

EARNINGS: 25,000-75,000

\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00
\$ 10,000.00



earnings



Biological Technologists and Technicians

NOC 2221

Biological technologists and technicians provide technical support and services to scientists, engineers and other professionals working 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. They are 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 resource and utilities companies.

Example Titles

- Agricultural Technician / Agricultural Technologist
- Bacteriological Technician / Biological Laboratory Technologist
- Botanical Technician / Fish Hatchery Technician
- Fisheries Technician / Food Bacteriological Technician
- Microbiology Quality Control Technologist / Microbiology Technologist (Except Medical)
- Wildlife Biology Technician

Employment Requirements

Completion of a two- to three-year college program in a field related to agriculture, biology, microbiology, wildlife or resource management is usually required for employment as a biological technologist.

Completion of a one- to two-year college program in a related field is required for employment as a biological technician.

Certification with provincial associations is available, but voluntary.

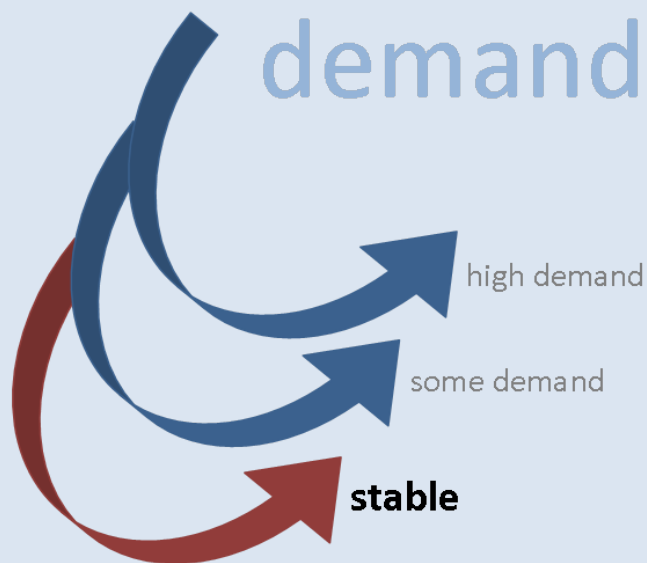
Related College & University Programs

- Bioinformatics
- Biotechnology
- Natural Sciences
- Chemical Engineering
- Microbiology

EARNINGS: 19,000-51,000

- \$ 80,000.00
- \$ 70,000.00
- \$ 60,000.00
- \$ 50,000.00
- \$ 40,000.00
- \$ 30,000.00
- \$ 20,000.00
- \$ 10,000.00

earnings



Civil Engineering Technologists and Technicians

NOC 2231

Civil engineering technologists and technicians 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, geotechnical engineering and environmental protection. They are employed by consulting engineering and construction companies, public works, transportation and other government departments and in many other industries.

Example Titles

Bridge Design Technician / Building Materials Technician
Civil Engineering Technician / Civil Engineering Technologist
Construction Technologist / Foundation Technologist
Highway Technician / Municipal Engineering Assistant
Soil Technologist – Civil Engineering / Specifications Writer, Construction
Structural Design Technologist / Structural Investigator

Employment Requirements

Completion of a two- or three-year college program in civil engineering technology or a closely related discipline is usually required for civil engineering technologists.

Completion of a one- or two-year college program in civil engineering technology is usually required for civil engineering technicians.

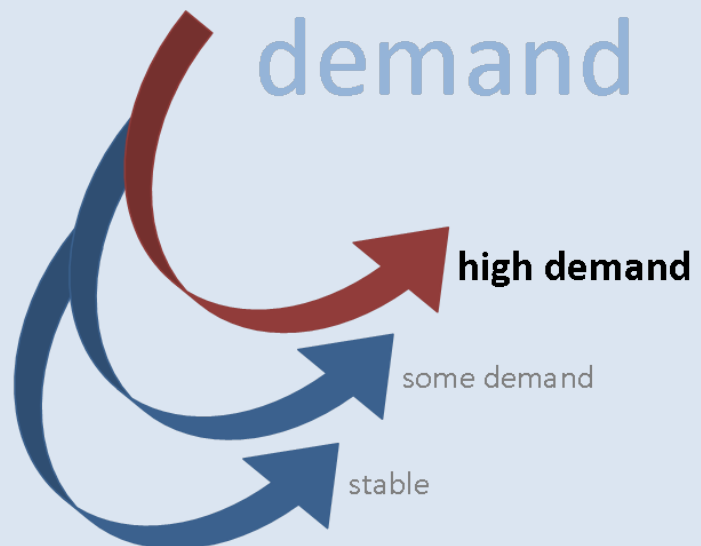
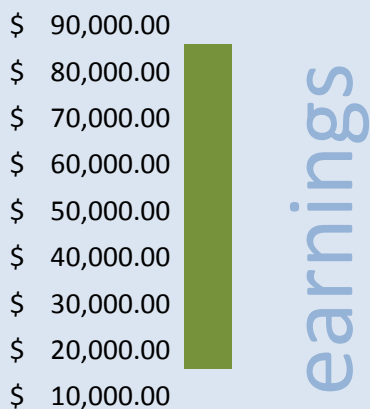
Certification in civil engineering technology or in a related field is available through provincial associations of engineering/applied science technologists and technicians and may be required for some positions.

A period of supervised work experience, usually two years, is required before certification.

Related College & University Programs

Civil Engineering (Certificate, diploma, undergraduate, graduate)

EARNINGS: 25,000-80,000



Mechanical Engineering Technologists and Technicians

NOC 2232

Mechanical engineering technologists and technicians 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. They are employed by consulting engineering, manufacturing and processing companies, institutions and government departments.

Example Titles

- HVAC (Heating, Ventilation and Air Conditioning) Technologist
- Aeronautical Technologist / Heating Designer
- Machine Designer / Marine Engineering Technologist
- Mechanical Engineering Technician / Mechanical Engineering Technologist
- Mechanical Technologist / Mould Designer
- Thermal Station Technician / Tool and Die Designer / Tool Designer

Employment Requirements

Completion of a two- or three-year college program in mechanical engineering technology is usually required for mechanical engineering technologists.

Completion of a one- or two-year college program in mechanical engineering technology is usually required for mechanical engineering technicians.

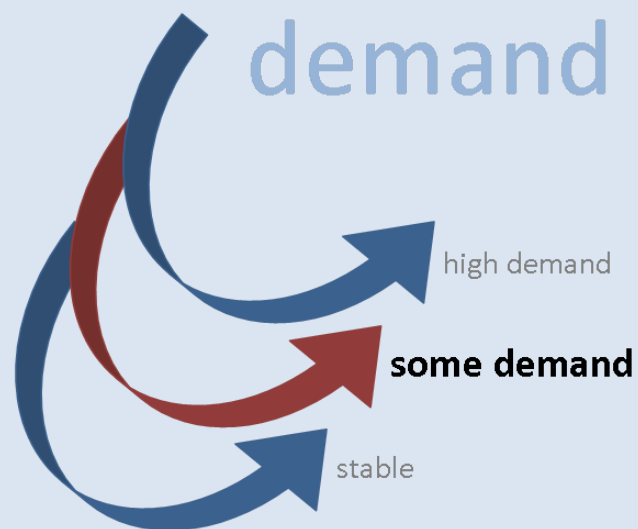
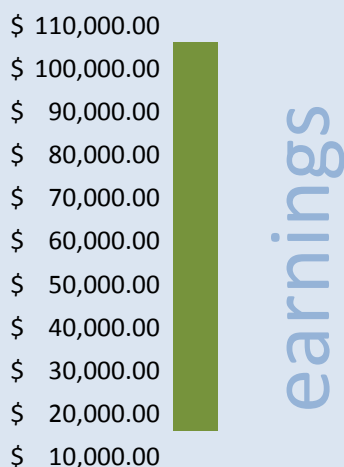
Certification in mechanical engineering technology or in a related field is available through provincial associations of engineering/applied science technologists and technicians and may be required for some positions.

A period of supervised work experience, usually two years, is required before certification.

Related College & University Programs

- Mechanical engineering technology
- Electrical Engineering
- Nanoscience
- Manufacturing engineering

EARNINGS: 25,000-100,000



Construction Estimators

NOC 2234

Construction estimators analyze costs of and prepare estimates on civil engineering, architectural, structural, electrical and mechanical construction projects. They are employed by residential, commercial and industrial construction companies and major electrical, mechanical and trade contractors, or they may be self-employed.

Example Titles

- Chief Estimator – Construction
- Construction Estimator
- Cost Estimator – Construction
- Principal Estimator – Construction
- Professional Quantity Surveyor
- Quantity Surveyor – Construction

Employment Requirements

Completion of secondary school is required.

Completion of a three-year college program in civil or construction engineering technology or several years of experience as a qualified tradesperson in a construction trade such as plumbing, carpentry or electrical, are required.

Certification by the Canadian Institute of Quantity Surveyors is usually required.

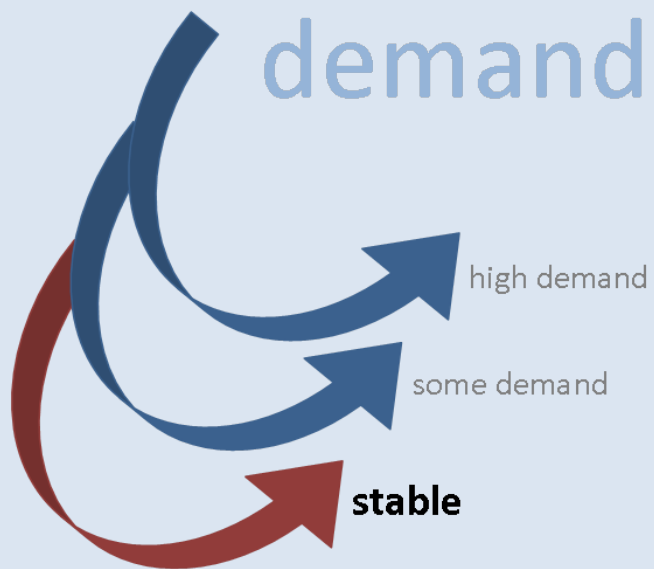
Related College & University Programs

- Architectural technology (Certificate, diploma, undergraduate, graduate)
- Civil Engineering
- Construction Engineering
- Construction Estimator
- Building Construction Technician

EARNINGS: 34,000-88,000

- \$ 100,000.00
- \$ 90,000.00
- \$ 80,000.00
- \$ 70,000.00
- \$ 60,000.00
- \$ 50,000.00
- \$ 40,000.00
- \$ 30,000.00
- \$ 20,000.00
- \$ 10,000.00

earnings



Electrical & Electronics Engineering Technologists & Technicians

NOC 2241

Electrical and electronics engineering technologists and technicians may work independently or provide technical support and services in the design, development, testing, production and operation of electrical and electronic equipment and systems. They are employed by electrical utilities, communications companies, manufacturers of electrical and electronic equipment, consulting firms, and in governments and a wide range of manufacturing, processing and transportation industries.

Example Titles

Communications Technologist / Electrical Engineering Technician
Electrical Engineering Technologist / Electricity Distribution Network Technologist
Electronics Design Technologist / Electronics Engineering Technician
Electronics Engineering Technologist / Electronics Manufacturing Technician
Electronics Manufacturing Technologist / Lighting Technologist / Metering Technologist

Employment Requirements

Completion of a two- or three-year college program in electrical or electronics engineering technology, computer engineering technology, telecommunications technology or an equivalent is usually required for electrical or electronics engineering technologists.

Completion of a one- or two-year college program in electrical or electronics engineering technology is usually required for electrical or electronics engineering technicians.

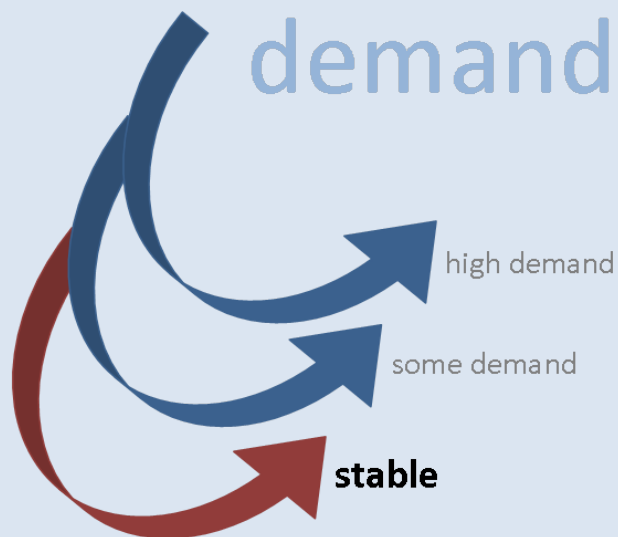
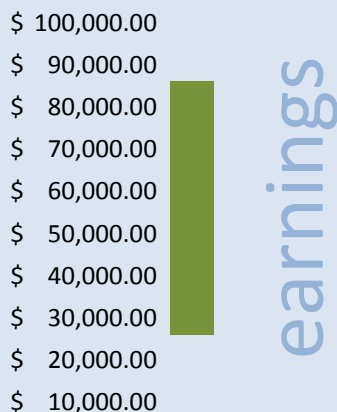
Certification in electrical or electronics engineering technology or in a related field is available through provincial associations of engineering/applied science technologists and technicians and may be required for some positions.

A period of supervised work experience, usually two years, is required before certification.

Related College & University Programs

Electrical engineering
Mathematical engineering
Engineering physics
Mechanical engineering

EARNINGS: 30,000-80,000



Drafting Technologists and Technicians

NOC 2253

Drafting technologists and technicians prepare engineering designs, drawings and related technical information, in multidisciplinary engineering teams or in support of engineers, architects or industrial designers, or they may work independently. They are employed by consulting and construction companies, utility, resource and manufacturing companies, all levels of government and by a wide range of other establishments.

Example Titles

- Architectural Draftsperson / Computer-Assisted Design And Drafting Technologist
- Computer-Assisted Drafting (CAD) Technician / Design And Drafting Technologist
- Drafting Technician / Drafting Technologist
- Draftsperson / Electrical Draftsperson
- Electromechanical Draftsperson / Electronic Draftsperson
- Engineering Design And Drafting Technologist
- Mechanical Draftsperson / Steel Detailer – Drafting
- Structural Draftsperson / Structural Steel Drafter-Detailer / Supervisor, Drafting Office

Employment Requirements

Completion of secondary school is usually required.

Completion of a two- to three-year college program in engineering design and drafting technology or in a related field is usually required for drafting and design technologists.

Completion of a 1-2 year college program in drafting or completion of a 3-4 year apprenticeship program or 4-5 years of related experience plus completion of college or industry courses in drafting are usually required for drafting technicians.

Trade certification for draftspersons is available, but voluntary in Ontario.

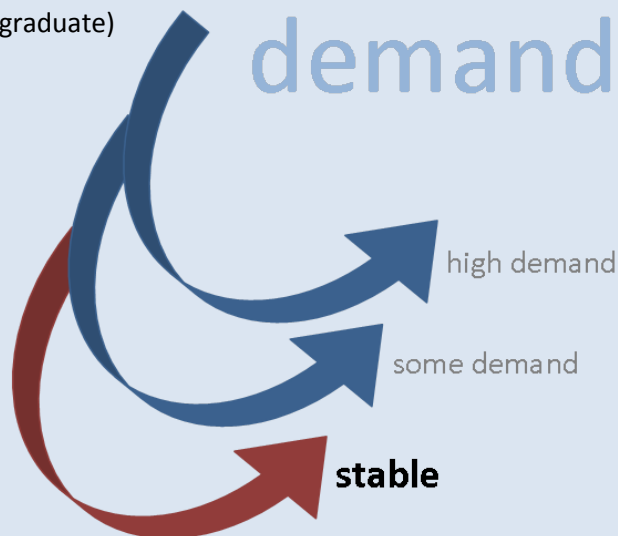
Related College & University Programs

- Civil Engineering (College, undergraduate)
- Industrial Drafting (College, undergraduate)
- Mining Engineering (College, undergraduate)
- Drafting and Design Technologist (College, undergraduate)

EARNINGS: 25,000-75,000

- \$ 90,000.00
- \$ 80,000.00
- \$ 70,000.00
- \$ 60,000.00
- \$ 50,000.00
- \$ 40,000.00
- \$ 30,000.00
- \$ 20,000.00
- \$ 10,000.00

earnings



Land Survey Technologists and Technicians

NOC 2254

Land survey technologists and technicians 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. They are employed by all levels of government, architectural and engineering firms, and by private sector surveying establishments.

Example Titles

Engineering Survey Technologist
Geodetic Survey Technologist
Geomatics Technologist – Land Surveying
Land Survey Technician
Legal Survey Technician
Topographic Survey Technician
Transit Operator – Surveying

Employment Requirements

Completion of secondary school is usually required.

Completion of a two- to three-year college program in geomatics or land survey technology is usually required for land survey technologists.

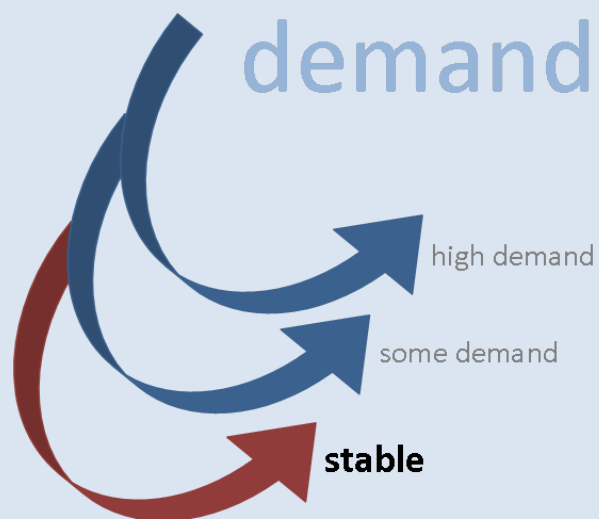
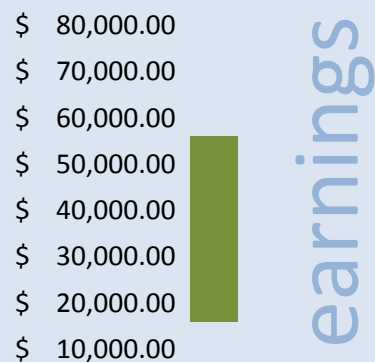
Completion of a one- to two-year college program in geomatics or land survey technology is usually required for land survey technicians.

Certification by provincial associations of technicians and technologists may be required by some employers.

Related College & University Programs

Environmental technology (College)
Geomatics technician (College)
Urban and regional planning technician (College)

EARNINGS: 19,000-51,000



Technical Occupations in Geomatics and Meteorology

NOC 2255

Technical occupations in geomatics include aerial survey, remote sensing, geographic information systems, cartographic and photogrammetric technologists and technicians, who gather, analyze, interpret and use geospatial information for applications in natural resources, geology, environmental research and land use planning. Geomatics technologists and technicians are employed by all levels of government, utilities, mapping, computer software, forestry, architectural, engineering and consulting firms and other related establishments.

Example Titles

Aerial Survey Technician / Aerological Technician
Cartographer / Climate Data Processor
Climate Service Technician / Geographic Information Systems (GIS) Technician
Ice Observer / Map Editor / Mapping Technician
Meteorological Inspector / Meteorological Technician
Photogrammetric Technologist / Photogrammetrist
Remote Sensing (RS) Technician / Softcopy Photogrammetrist / Surface Weather Observer

Employment Requirements

Completion of secondary school is required.

Geomatics technologists require completion of a two- to three-year college program in cartography, photogrammetry, aerial survey, remote sensing, geographic information system or geomatics.

Geomatics technicians require completion of a one- to two-year college program in cartography, photogrammetry, aerial survey, remote sensing, geographic information system or geomatics.

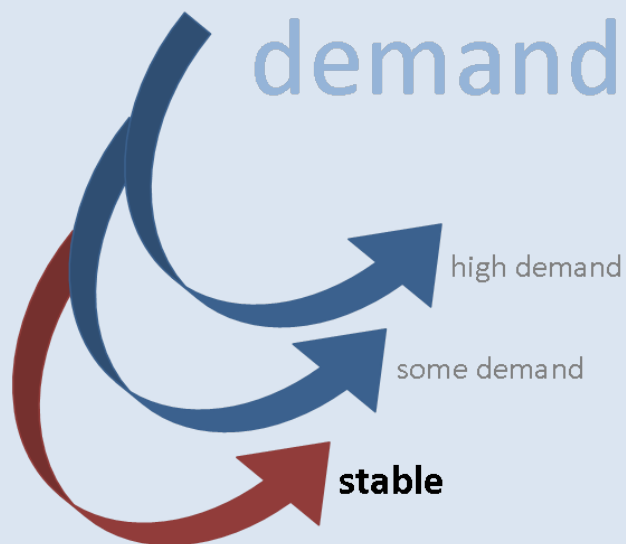
Related College & University Programs

Geomatics Engineering (Undergraduate, Graduate)
Geographical Information Systems (College, Undergraduate)
Geomatics and Spatial Analysis (Undergraduate, Graduate)
Civil Engineering (College, Undergraduate, Graduate)

EARNINGS: 37,000-75,000

\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00
\$ 10,000.00

earnings



Engineering Inspectors and Regulatory Officers

NOC 2262

Engineering inspectors and regulatory officers inspect transportation vehicles such as aircraft, watercraft, automobiles and trucks and weighing and measuring devices such as scales and meters as well as industrial instruments, processes and equipment for conformity to government and industry standards and regulations. They are employed by government agencies and in the private sector.

Example Titles

- Airworthiness Inspector
- Elevator Inspector
- Engineering Inspector
- Inspector, Air Carrier Maintenance
- Inspector, Air Transport
- Inspector, Electricity And Gas Meters
- Inspector, Weights And Measures
- Insurance Loss Prevention Inspector
- Marine Damage Surveyor
- Motor Vehicle Defects Investigator
- Railway Accident Investigation Officer
- Regulatory Officer, Engineering

Employment Requirements

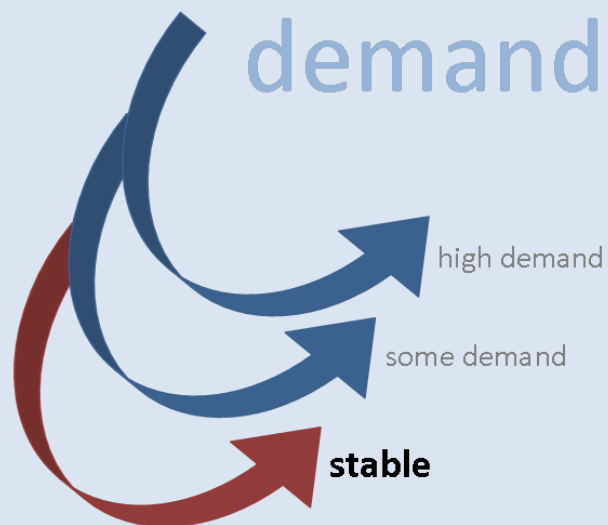
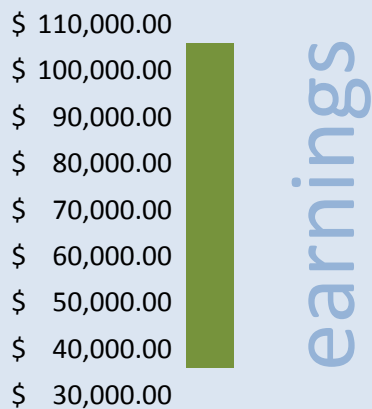
University degree or college diploma in an appropriate engineering field or Trade qualifications and extensive related work experience are required.

Appropriate professional engineering or engineering technology certification and licences may be required.

Related College & University Programs

- Civil engineering technician (College)
- Construction engineering (College)
- Mechanical engineering (College)

EARNINGS: 40,000-103,000



Inspectors in Public and Environmental Health and Occupational Health and Safety

NOC 2263

Inspectors in this unit group evaluate and monitor health and safety hazards and develop strategies to control risks in the workplace. They inspect restaurants, public facilities, industrial establishments, municipal water systems and other workplaces to ensure compliance with government regulations regarding sanitation, pollution control, the handling and storage of hazardous substances and workplace safety. They are employed throughout the private and public sectors.

Example Titles

- Environmental Health Officer / Hazardous Waste Inspector
- Health and Safety Officer / Health Standards Inspector
- Occupational Health and Safety Officer
- Pollution Control Inspector
- Public Health Inspector / Restaurant Inspector
- Rodent Control Inspector
- Supervisor, Public Health Inspectors / Water Inspector

Employment Requirements

A bachelor's degree or college diploma in a discipline such as food science, environmental studies, chemistry or health and safety is usually required.

In some establishments, several years of related work experience and the completion of in-house training courses may substitute for formal education.

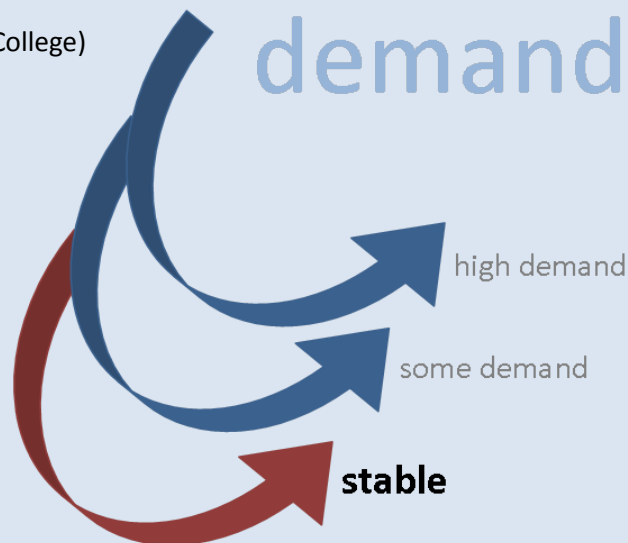
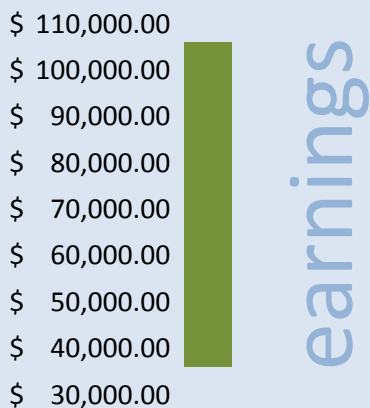
Public health inspectors employed outside Quebec require certification with the Canadian Institute of Public Health Inspectors.

Occupational health and safety officers may require certification with the Association for Canadian Registered Safety Professionals.

Related College & University Programs

- Occupational Health and Safety Management (College)
- Environmental Technician (College)

EARNINGS: 40,000-103,000



Inspectors and Testers, Mineral and Metal Processing

NOC 9415

Inspectors and testers in this unit group inspect, grade, sample or test raw materials and products from mineral ore and metal processing operations. They are employed in mineral ore and metal processing plants such as copper, lead and zinc refineries, uranium processing plants, steel mills, aluminum plants, precious metal refineries, cement processing plants, clay, glass and stone processing plants and foundries.

Example Titles

Asbestos Grader
Brick And Tile Inspector
Castings Tester – Primary Metal And Mineral Products Processing
Clay Products Grader
Core Tester – Foundry
Fibreglass Tester
Glass Quality Control Inspector
Heat Treating Inspector – Metal Processing
Metal Processing Inspector
Mineral Sampler – Mineral Products Processing
Molten Metal Sampler – Primary Metal Processing
Salvage Glass Inspector
Sheet Steel Inspector – Primary Metal Processing
Steel Tester – Primary Metal Processing

Employment Requirements

Completion of secondary school is usually required.

Experience as a machine or process operator in mineral and metal processing is usually required.

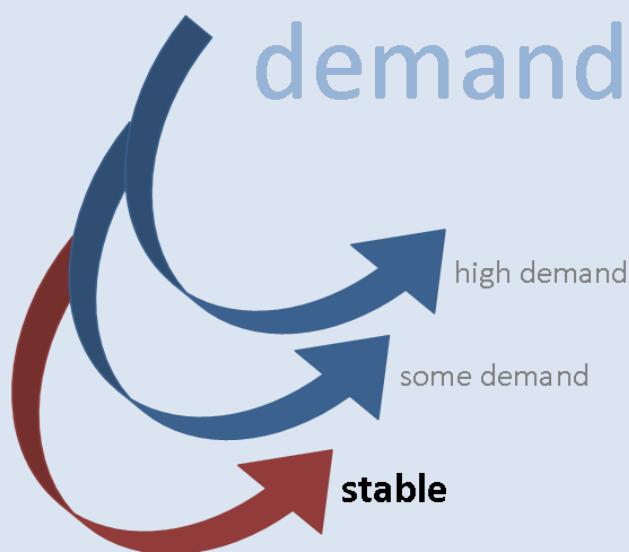
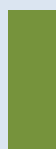
Related College & University Programs

Civil engineering technician (College)
Construction engineering (College)
Architectural technology (College)

EARNINGS: 23,000-49,000

\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00
\$ 10,000.00

earnings



Supervisors, Coordinators and Foremen

Hiring requirements in the supervisor, coordinator and foremen category are high with replacement challenges due to a high number of the current workforce approaching retirement in the next decade.

0211	Engineering Managers
0711	Construction Managers
0811	Primary Production Managers (Except Agriculture)
1475	Dispatchers and Radio Operators
1476	Transportation Route and Crew Schedulers
7213	Contractors and Supervisors, Pipefitting Trades
7216	Contractors and Supervisors, Mechanic Trades
8221	Supervisors, Mining and Quarrying
9211	Supervisors, Mineral and Metal Processing



Engineering Managers

NOC 0211

Engineering Managers plan, organize, direct, control and evaluate the activities of an engineering department, service or firm. They are employed by a wide range of private sector and government establishments and by consulting engineering and scientific research companies.

Example Titles

Director, Engineering Research And Development
Electrical Engineering Service Manager
Engineering Department Manager
Engineering Manager
Manager, Telecommunications Engineering Service
Production Engineering Manager

Employment Requirements

A bachelor's degree in engineering is usually required.

Extensive experience in an engineering discipline, including supervisory experience, is required.

Registration as a Professional Engineer (P. Eng.) by a provincial or territorial association of professional engineers is usually required.

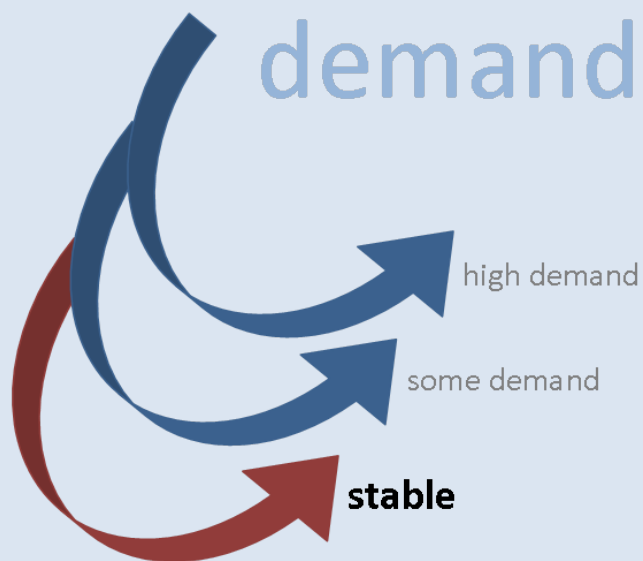
Related College & University Programs

Engineering science (Undergraduate, graduate)
Civil Engineering (College, undergraduate, graduate)
Technology innovation management
Construction engineering technology
Business Administration (graduate)

EARNINGS: 42,000-134,000

\$ 140,000.00
\$ 130,000.00
\$ 120,000.00
\$ 110,000.00
\$ 100,000.00
\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00

earnings



Construction Managers

NOC 0711

Construction Managers plan, organize, direct, control and evaluate the activities of a construction company or a construction department within a company, under the direction of a general manager or other senior manager. They are employed by residential, commercial and industrial construction companies and by construction departments of companies outside the construction industry.

Example Titles

Commercial Construction Manager / Construction Manager
Construction Superintendent / General Contractor
Housing Construction Manager / Industrial Construction Manager
Pipeline Construction Manager / Project Manager, Construction
Residential Construction Manager

Employment Requirements

A university degree in civil engineering or a college diploma in construction technology is usually required.

A master's degree in project management may be required.

Several years of experience in the construction industry, including experience as a construction supervisor or field superintendent, are usually required.

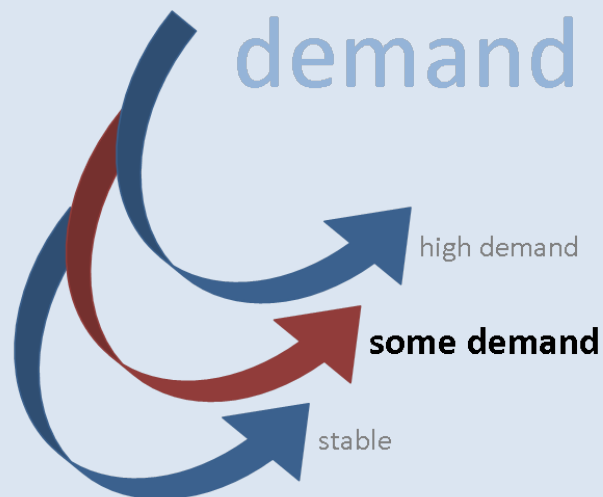
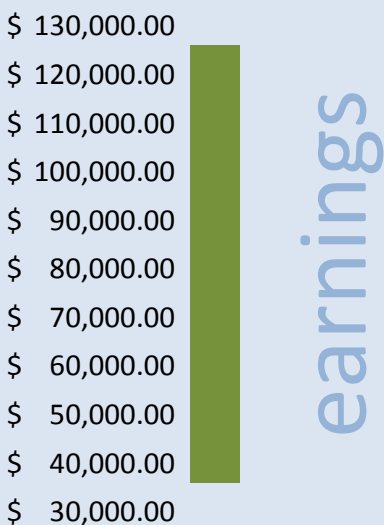
Extensive experience in the construction industry may substitute for post-secondary education requirements.

Professional engineering status or construction trade certification may be required by some employers.

Related College & University Programs

Civil Engineering (College)
Construction Engineering (College, Undergraduate)
Construction Management (College)
Building Construction Technician (College)
Energy Systems Engineering Technology (College)

EARNINGS: 42,000-114,000



Primary Production Managers

NOC 0811

This unit group includes managers who plan, organize, direct, control and evaluate the operations of establishments in forestry and logging, mining and quarrying, oil and gas drilling, production and servicing operations, and commercial fishing.

Example Titles

Director of Mining / Manager, Drilling Operations
Manager, Fishing Operations / Manager, Forestry Operations
Manager, Gas Field Operations / Manager, Oil Well Servicing
Mine Manager / Quarry Manager

Employment Requirements

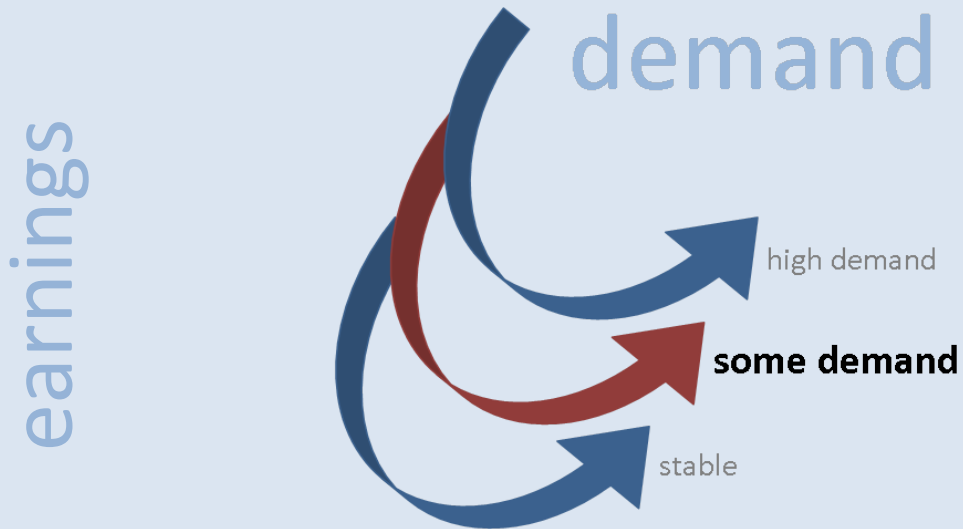
Forestry managers usually require a bachelor's degree in forestry science or forest engineering.
Mining and quarrying managers usually require a bachelor's degree in mining engineering or earth sciences.
Oil and gas managers usually require a bachelor's degree in geology, earth sciences or petroleum engineering.
Several years of experience in a supervisory occupation in the particular industry are usually required and may substitute for formal education requirements.

Related College & University Programs

Forestry Science
Forestry Engineering
Mining Engineering
Earth Sciences
Geology
Petroleum Engineering

EARNINGS: 23,000-135,000

\$ 140,000.00
\$ 130,000.00
\$ 120,000.00
\$ 110,000.00
\$ 100,000.00
\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00
\$ 10,000.00



Dispatchers and Radio Operators

NOC 1475

Dispatchers operate radios and other telecommunication equipment to dispatch emergency vehicles and to coordinate the activities of drivers and other personnel. They are employed by police, fire and health departments, other emergency service agencies, taxi, delivery and courier services, trucking and utilities companies, and other commercial and industrial establishments.

Example Titles

- 911 Dispatcher
- Alarm System Dispatcher
- Ambulance Dispatcher
- Emergency Vehicle Dispatcher
- Inbound/Outbound Freight Co-Ordinator
- Mobile Equipment Dispatcher
- Radio Operator
- Taxi Dispatcher
- Tow Truck Dispatcher
- Truck Dispatcher
- Utilities Maintenance Crew Dispatcher

Employment Requirements

Completion of secondary school is required.

Police and emergency dispatchers are required to complete formal on-the-job training. Other dispatchers usually undergo some informal on-the-job training.

Police and emergency dispatchers and other radio operators usually require provincial radio operator's certificates.

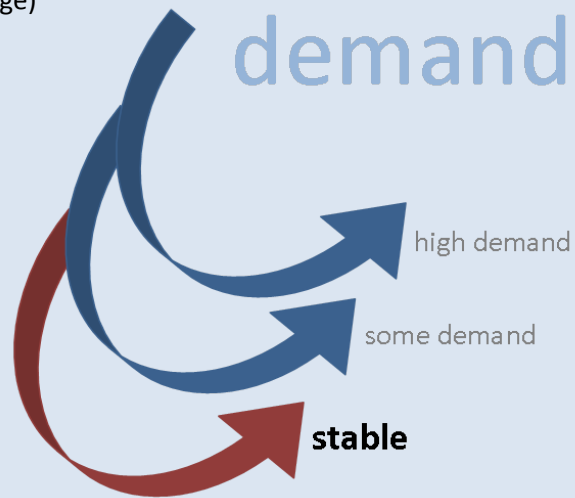
Related College & University Programs

- Emergency Services Fundamentals (College)
- Emergency Telecommunications (College)
- Transportation Operations Specialist (Certificate, College)
- 911 And Emergency Service Communications (College)

EARNINGS: 25,000-67,000

- \$ 90,000.00
- \$ 80,000.00
- \$ 70,000.00
- \$ 60,000.00
- \$ 50,000.00
- \$ 40,000.00
- \$ 30,000.00
- \$ 20,000.00
- \$ 10,000.00

earnings



Transportation Route and Crew Schedulers

NOC 1476

Transportation route and crew schedulers prepare operational and crew schedules for transportation equipment and operating personnel. They are employed by municipal transit commissions, truck, delivery and courier companies, railways, airlines and by other transportation establishments in both the private and public sectors.

Example Titles

- Bus Scheduler
- Crew Scheduler, Transportation
- Flight Crew Scheduler
- Schedule Analyst
- Schedule Writer, Transportation
- Train Scheduler
- Transit Scheduler
- Truck Scheduler

Employment Requirements

Completion of secondary school is required.

Several years of experience in an appropriate transportation sector are usually required.

On-the-job training may be provided.

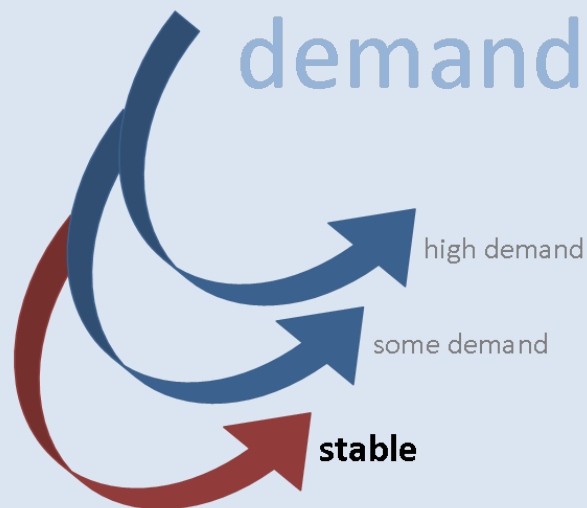
Related College & University Programs

Construction Engineering Technology Management (College)

EARNINGS: 26,000-55,000

- \$ 80,000.00
- \$ 70,000.00
- \$ 60,000.00
- \$ 50,000.00
- \$ 40,000.00
- \$ 30,000.00
- \$ 20,000.00
- \$ 10,000.00

earnings



Contractors and Supervisors, Pipefitting Trades

NOC 7213

This unit group includes plumbing and other pipefitting trade contractors who own and operate their own businesses. This group also includes supervisors who supervise and co-ordinate the activities of workers classified in the following unit groups: Plumbers (7251), Steamfitters, Pipefitters and Sprinkler System Installers (7252) and Gas Fitters (7253). They are employed by construction companies, mechanical, plumbing and pipefitting trade contractors and maintenance departments of industrial, commercial and manufacturing establishments.

Example Titles

Contractor, Pipefitting
Contractor, Plumbing
Foreman-Woman, Gas Fitters
Foreman-Woman, Pipefitters
Foreman-Woman, Plumbers
Foreman-Woman, Sprinkler System Installers
Foreman-Woman, Steamfitters
Supervisor, Gas Fitters
Supervisor, Plumbers
Supervisor, Steamfitters

Employment Requirements

Completion of secondary school is usually required.

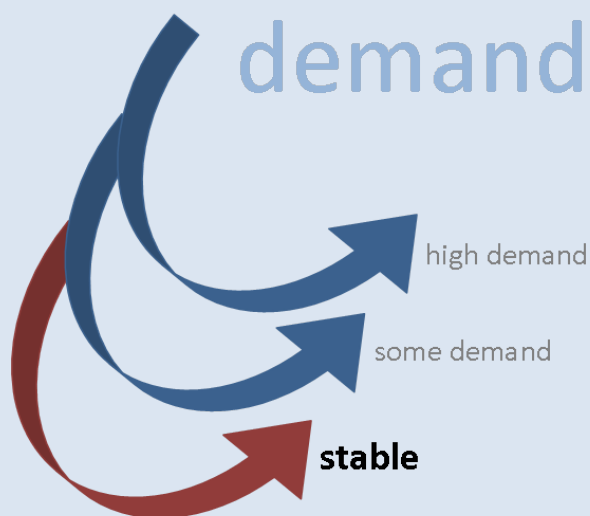
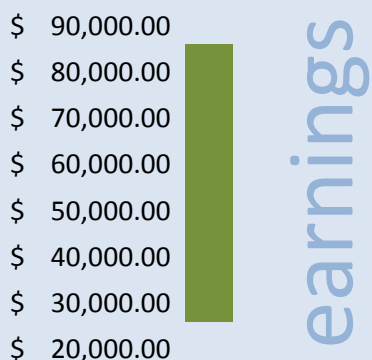
Several years of experience as a qualified tradesperson in a relevant trade are required.

Journeyman/woman trade certification in a relevant trade is required.

Related College & University Programs

Welder Technology (College)

EARNINGS: 30,000-88,000



Contractors and Supervisors, Mechanic Trades

NOC 7216

This unit group includes heating, refrigeration, air conditioning, millwrighting and elevator and other equipment installation and mechanic trades contractors who own and operate their own businesses. This group also includes supervisors who supervise and co-ordinate the activities of workers classified in unit groups within the following minor groups: Machinery and Transportation Equipment Mechanics. They are employed in a wide range of establishments; places of employment are indicated in the unit group descriptions of the above minor groups.

Example Titles

- Contractor, Heating Systems
- Foreman-Woman, Air Conditioning and Refrigeration Mechanics
- Foreman-Woman, Aircraft Mechanics and Inspectors
- Foreman-Woman, Electrical Mechanics / Foreman-Woman, Heating Systems Mechanics
- Foreman-Woman, Heavy-Duty Equipment Mechanics
- Foreman-Woman, Printing Machine Repairers / Foreman-Woman, Railway Car Repairers
- Foreman-Woman, Railway Equipment Maintenance Inspectors
- Foreman-Woman, Textile Machine Mechanics
- Supervisor, Aircraft Maintenance Engineers (AME)
- Supervisor, Appliance Repair Shop / Supervisor, Industrial Mechanics
- Supervisor, Motor Vehicle Repair Shop / Supervisor, Small-Engine Repair Shop

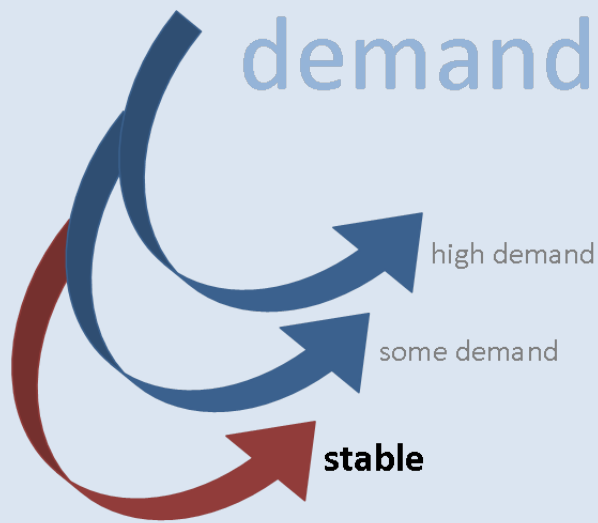
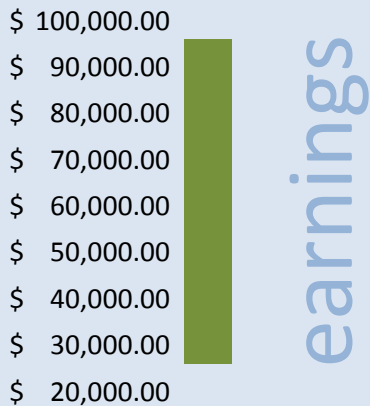
Employment Requirements

- Completion of secondary school is usually required.
- Several years of experience as a qualified tradesperson in a relevant trade are usually required.
- Journeyman/woman trade certification in a relevant trade is required.

Related College & University Programs

- Construction Technician
- Mechanical Techniques

EARNINGS: 35,000-94,000



Supervisors, Mining and Quarrying

NOC 8221

Supervisors in this unit group supervise and co-ordinate activities of workers engaged in underground and surface mining operations and quarries. They are employed by coal, metal and non-metallic mineral mines and quarries.

Example Titles

- Fill Foreman-Woman – Underground Mining
- Foreman-Woman, Underground Mine
- Mine Captain / Mine Foreman-Woman
- Supervisor, Mine / Supervisor, Quarry
- Supervisor, Surface Mine / Track Boss – Underground Mining

Employment Requirements

Completion of secondary school is required.

Completion of a college or university program in mining technology or engineering may be required for some positions in this group.

Several years of experience in the occupations supervised are usually required.

Provincial certification as an underground mine supervisor, shift boss, or coal mining supervisor may be required.

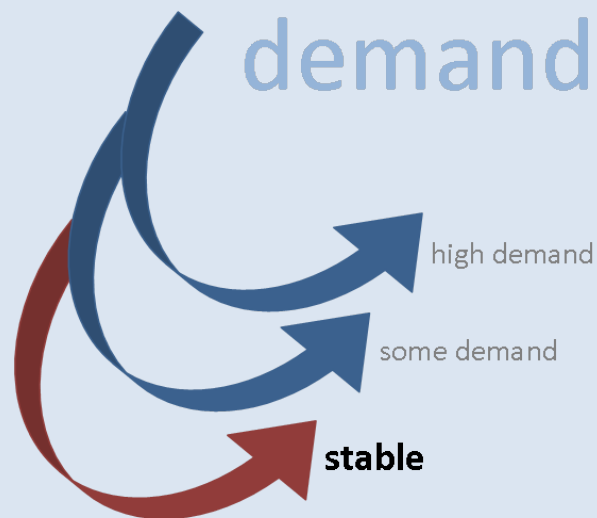
Related College & University Programs

- Mining Technology (College, Undergraduate)
- Mining Engineering (College, Undergraduate)
- Civil Engineering (College, Undergraduate)
- Materials Engineering (Undergraduate, Graduate)
- Materials Science (Undergraduate, Graduate)

EARNINGS: 35,000-104,000

\$ 120,000.00
\$ 110,000.00
\$ 100,000.00
\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00

earnings



Supervisors, Mineral and Metal Processing

NOC 9211

Supervisors, mineral and metal processing, supervise and co-ordinate the activities of workers in the following groups: Central Control and Process Operators, Mineral and Metal Processing, Machine Operators and Related Workers in Metal and Mineral Products Processing and Manufacturing and Labourers in Mineral and Metal Processing. They are employed in mineral ore and metal processing plants such as copper, lead and zinc refineries, uranium processing plants, steel mills, aluminum plants, precious metal refineries, cement processing plants, clay, glass and stone processing plants and foundries.

Example Titles

Blast Furnace Foreman-Woman
Brick And Tile Foreman-Woman
Cement Processing Supervisor
Coremaking Foreman-Woman – Foundry
Die Casting Supervisor
Foreman-Woman, Lead Refining
Lime Preparation Foreman-Woman
Melting And Roasting Department Supervisor
Ore Milling Supervisor
Roll Shop Operations Coach – Steel Mill
Shift Co-Ordinator, Steel Mill
Supervisor, Glass Cutters

Employment Requirements

Completion of secondary school is usually required.

Post-secondary education in metallurgy, sciences or a related field may be required for some occupations in this unit group.

Several years of experience as a worker in the unit or department being supervised are usually required.

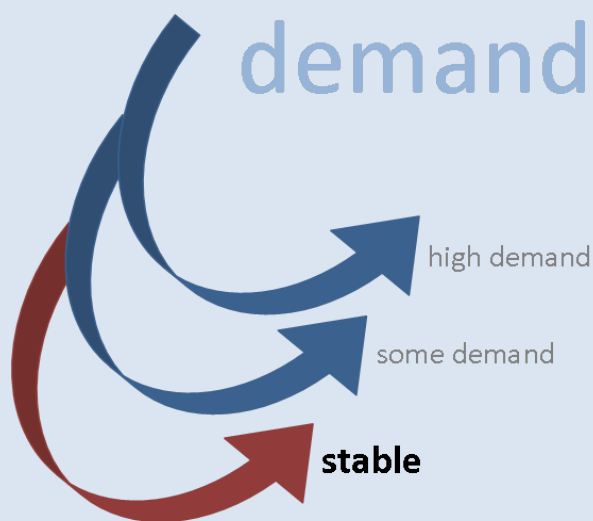
Related College & University Programs

Materials Engineering (Undergraduate, Graduate)
Materials Science (Undergraduate, Graduate)

EARNINGS: 38,000-67,000

\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00
\$ 10,000.00

earnings



All Other Occupations

There are a number of additional functions within the mining industry that are crucial to day-to-day operations. Several of these occupations are crucial in the northwest region, while others will be new to the region as the mining market continues to expand.

6242	Cooks
7251	Plumbers
7252	Steamfitters, Pipefitters And Sprinkler System Installers
7271	Carpenters
7242	Industrial Electricians
7265	Welders and Related Machine Operators
7311	Construction Millwrights and Industrial Mechanics (Except Textile)
7312	Heavy-Duty Equipment Mechanics
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7371	Crane Operators
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Cooks

NOC 6242

Cooks prepare and cook a wide variety of foods. They are employed in restaurants, hotels, hospitals and other health care institutions, central food commissaries, educational institutions and other establishments. Cooks are also employed aboard ships and at construction and logging campsites. Apprentice cooks are included in this unit group.

Example Titles

- Apprentice Cook / Cook
- Dietary Cook / First Cook
- Grill Cook / Hospital Cook
- Institutional Cook / Journeyman-Woman Cook
- Licensed Cook / Line Cook
- Second Cook / Short Order Cook

Employment Requirements

Completion of secondary school is usually required.

Completion of a three-year apprenticeship program for cooks or Completion of college or other program in cooking or several years of commercial cooking experience are required.

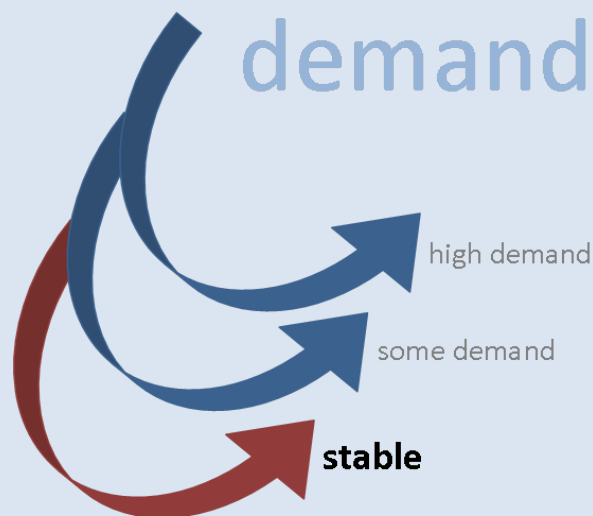
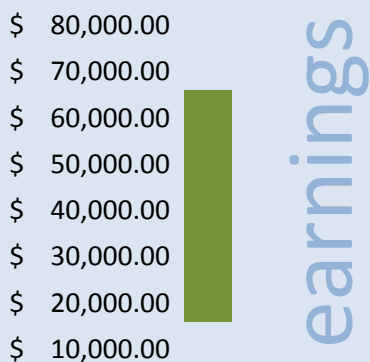
Trade certification is available, but voluntary, in all provinces and territories.

Red Seal endorsement is also available to qualified cooks upon successful completion of the interprovincial Red Seal examination.

Related College & University Programs

- Culinary skills (College)
- Chef Training (College)
- Chef- Apprenticeship (College)
- Culinary Management (College)
- Hospitality Services (College)

EARNINGS: 20,000-70,000



Plumbers

NOC 7251

Plumbers install, repair and maintain pipes, fixtures and other plumbing equipment used for water distribution and waste water disposal in residential, commercial and industrial buildings. They are employed in maintenance departments of factories, plants and similar establishments, by plumbing contractors, or they may be self-employed.

Example Titles

- Maintenance Plumber
- Plumber
- Plumber Apprentice
- Plumbing Mechanic

Employment Requirements

Completion of secondary school is usually required.

Completion of a four- to five-year apprenticeship program or a combination of over five years of work experience in the trade and some high school, college or industry courses in plumbing is usually required to be eligible for trade certification.

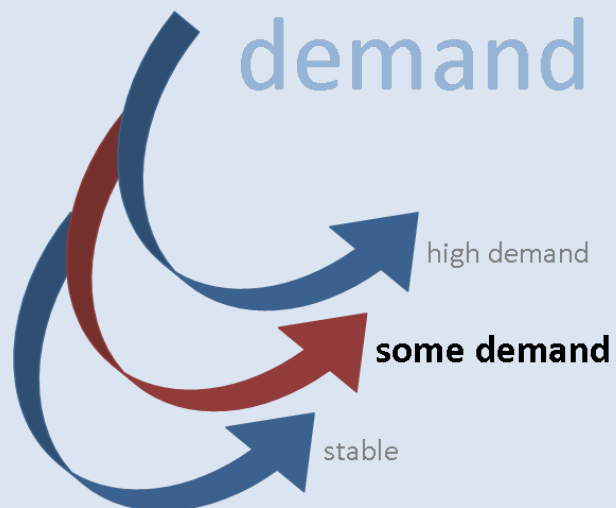
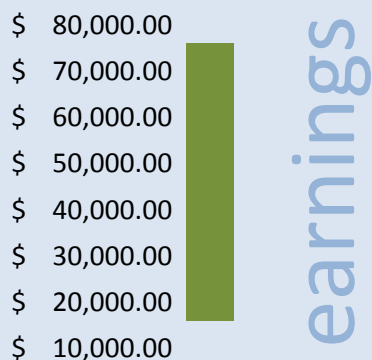
Trade certification is compulsory in Nova Scotia, Prince Edward Island, New Brunswick, Quebec, Ontario, Saskatchewan and Alberta and available, but voluntary, in Newfoundland and Labrador, Manitoba, British Columbia, the Yukon, the Northwest Territories and Nunavut.

Red Seal endorsement is also available to qualified plumbers upon successful completion of the interprovincial Red Seal examination.

Related College & University Programs

- Plumber Apprenticeship (College)
- Plumbing Techniques (College)
- Construction Craft Worker Apprenticeship (College)

EARNINGS: 20,000-80,000



Steamfitters, Pipefitters and Sprinkler System Installers

NOC 7252

Steamfitters and pipefitters lay out, assemble, fabricate, maintain, troubleshoot and repair piping systems carrying water, steam, chemicals and fuel in heating, cooling, lubricating and other process piping systems. Sprinkler system installers fabricate, install, test, maintain and repair water, foam, carbon dioxide and dry chemical sprinkler systems in buildings for fire protection purposes. Steamfitters, pipefitters and sprinkler system installers are employed in maintenance departments of factories, plants and similar establishments, and by pipefitting and sprinkler system contractors, or they may be self-employed.

Example Titles

Apprentice Pipefitter-Steamfitter / Fire Protection Mechanic
Fire Sprinkler Fitter / Marine Pipefitter
Pipefitter / Sprinkler System Fitter
Sprinkler System Installer / Steamfitter
Steamfitter-Pipefitter

Employment Requirements

Completion of secondary school is usually required.

Completion of a 4-5 year apprenticeship program or a combination of over five years of work experience in the trade and some high school, college or industry courses in steamfitting, pipefitting or sprinkler system installation is usually required to be eligible for trade certification.

Steamfitter-pipefitter trade certification is compulsory in Prince Edward Island, Quebec, Ontario, Manitoba and Alberta and available, but voluntary, in all other provinces and the territories.

Red Seal endorsement is also available to qualified steamfitters-pipefitters and sprinkler system installers upon successful completion of the interprovincial Red Seal examination.

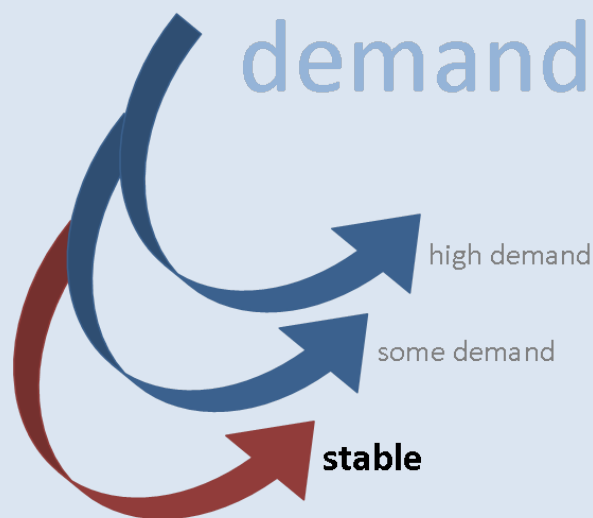
Related College & University Programs

Welders Techniques (College)
Facilities Mechanic (College)
Fire Systems Engineering Technician (College)

EARNINGS: 37,000-83,000

\$ 100,000.00
\$ 90,000.00
\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00
\$ 10,000.00

earnings



Carpenters

NOC 7271

Carpenters construct, erect, install, maintain and repair structures and components of structures made of wood, wood substitutes, lightweight steel and other materials. They are employed by construction companies, carpentry contractors, and maintenance departments of factories, plants and other establishments, or they may be self-employed.

Example Titles

- Apprentice Carpenter / Carpenter
- Carpenter-Joiner
- Finish Carpenter
- Journeyman-Woman Carpenter
- Maintenance Carpenter
- Metal Framer – Carpentry
- Renovation Carpenter / Rough Carpenter
- Stair Builder-Carpenter

Employment Requirements

Completion of secondary school is usually required.

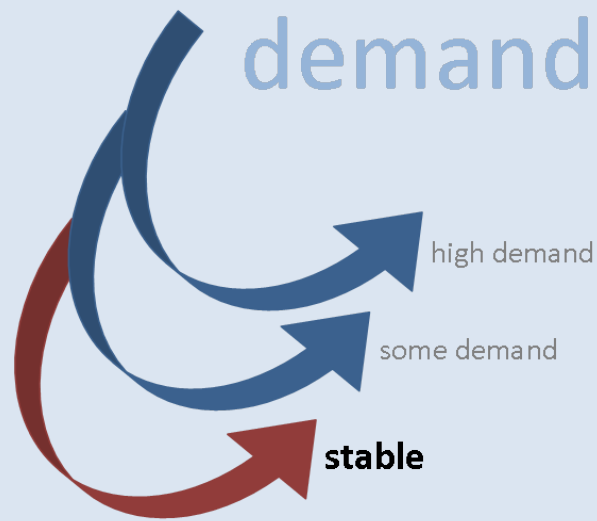
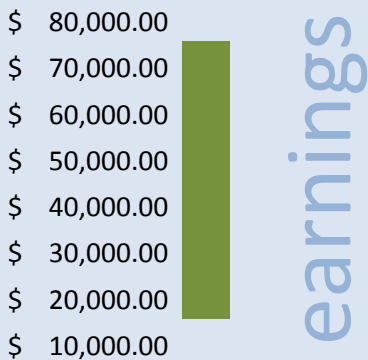
Completion of a 3-4 year apprenticeship program or a combination of over four years of work experience in the trade and some high school, college or industry courses in carpentry is usually required to be eligible for trade certification.

Red Seal endorsement is also available to qualified carpenters upon successful completion of the interprovincial Red Seal examination.

Related College & University Programs

- Carpentry (Certificate, Diploma)
- Building Trades
- Building Renovation Technician
- Construction Carpentry

EARNINGS: 29,000-71,000



Industrial Electricians

NOC 7242

Industrial electricians install, maintain, test, troubleshoot and repair industrial electrical equipment and associated electrical and electronic controls. They are employed by electrical contractors and maintenance departments of factories, plants, mines, shipyards and other industrial establishments.

Example Titles

- Electrician, Shipyard / Industrial Electrician
- Industrial Electrician Apprentice / Marine Electrician
- Mill Electrician / Mine Electrician
- Plant Electrician / Plant Maintenance Electrician

Employment Requirements

Completion of secondary school is usually required.

Completion of a 4-5 year industrial electrician apprenticeship program or a combination of over five years of work experience in the trade and some high school, college or industry courses in industrial electrical equipment is usually required to be eligible for trade certification.

Trade certification for industrial electricians is compulsory in Prince Edward Island, Quebec and Manitoba and available, but voluntary, in Newfoundland and Labrador, Nova Scotia, New Brunswick, Ontario, British Columbia and the Yukon.

Additional construction electrician certification may be required for industrial electricians when the employers are not owners of the industrial electrical equipment.

Red Seal endorsement is also available to qualified industrial electricians upon successful completion of the interprovincial Red Seal examination.

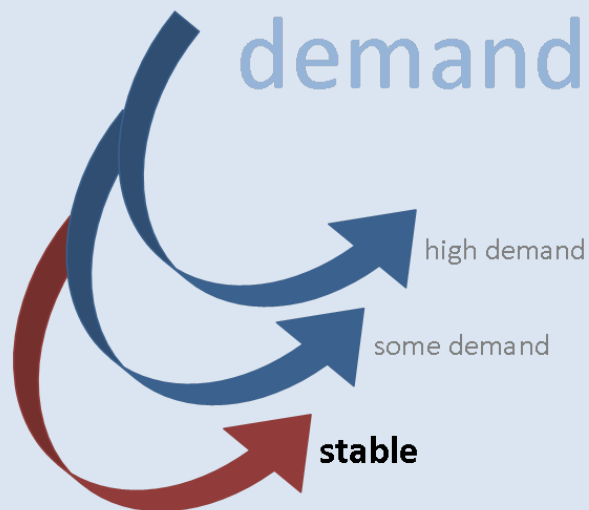
Related College & University Programs

- Electrical Engineering Technician (College)
- Electrical Techniques (College)
- Electrician Apprenticeships (College)
- Electronics Engineering (College)

EARNINGS: 40,000-65,000

- \$ 90,000.00
- \$ 80,000.00
- \$ 70,000.00
- \$ 60,000.00
- \$ 50,000.00
- \$ 40,000.00
- \$ 30,000.00
- \$ 20,000.00

earnings



Welders and Related Machine Operators

NOC 7265

Welders operate welding equipment to weld ferrous and non-ferrous metals. This unit group also includes machine operators who operate previously set up production welding, brazing and soldering equipment. They are employed by companies that manufacture structural steel and platework, boilers, heavy machinery, aircraft and ships and other metal products, and by welding contractors and welding shops, or they may be self-employed.

Example Titles

Brazing Machine Operator / Brazing Machine Setter
Electric Arc Welder / Journeyman/Woman Welder
Laser Welding Operator / Pressure Vessel Welder
Production Welder / Soldering Machine Operator
Spot Welder / Submerged Arc Welder
Welder / Welder Apprentice / Welder-Fitter

Employment Requirements

Welders - completion of secondary school is usually required.

Completion of a 3 year apprenticeship program or a combination of over three years of work experience in the trade and some college or industry courses in welding is usually required to be eligible for trade certification.

Red Seal endorsement is also available to qualified welders upon successful completion of the interprovincial Red Seal examination.

Welding, brazing and soldering machine operators - some secondary school education is required.

Several months of on-the-job training are usually provided. Experience as a machine operator helper may be required.

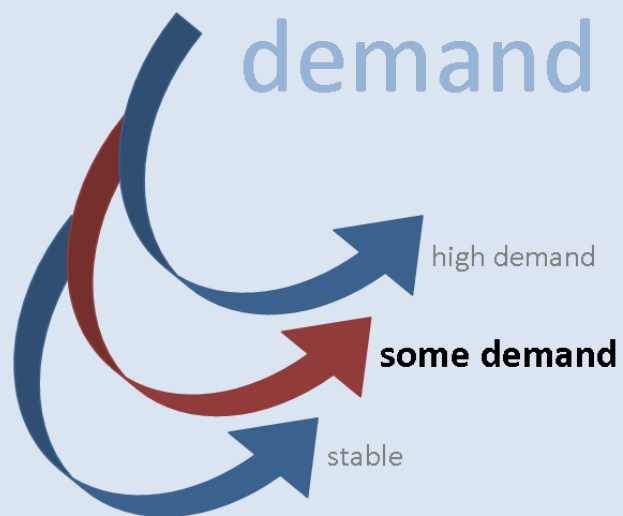
Related College & University Programs

Welder Apprenticeship (College)
Welding Techniques (College)
Trades Fundamentals (College)
Mechanical Techniques (College)

EARNINGS: 26,000-63,000

\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00
\$ 10,000.00

earnings



Construction Millwrights and Industrial Mechanics

NOC 7311

Construction millwrights and industrial mechanics install, maintain, troubleshoot, overhaul and repair stationary industrial machinery and mechanical equipment. This unit group includes industrial textile machinery mechanics and repairers. Construction millwrights are employed by millwrighting contractors. Industrial mechanics are employed in manufacturing plants, utilities and other industrial establishments.

Example Titles

Card Fixer / Card Grinder / Construction Millwright
Fixer, Textile Machinery / Industrial Mechanic
Industrial Mechanic Apprentice / Maintenance Millwright
Mechanic, Textile Machines / Millwright / Millwright Apprentice
Open-End Technician / Plant Equipment Mechanic / Spinning Fixer
Textile Fixer / Treatment Plant Maintenance Mechanic

Employment Requirements

Completion of secondary school is usually required.

Completion of a 3-4-year apprenticeship program or a combination of over five years of work experience in the trade and some high school, college or industry courses in industrial machinery repair or millwrighting is usually required to be eligible for trade certification.

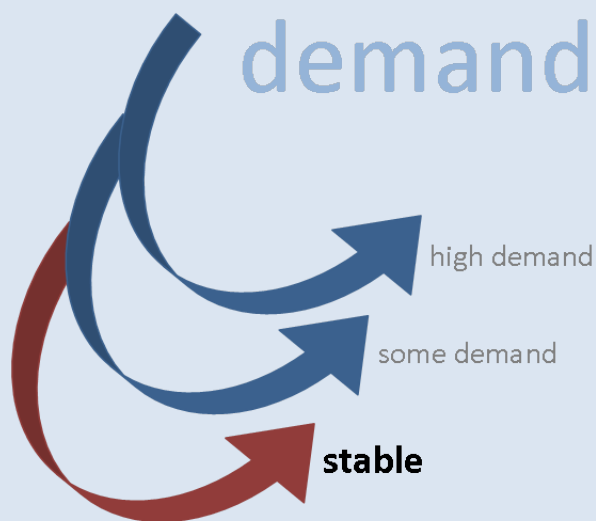
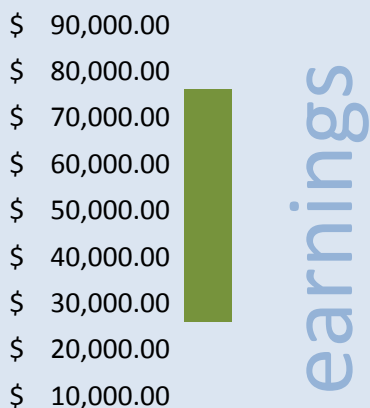
Construction millwright trade certification is available, but voluntary, in Ontario.

Red Seal endorsement is also available to qualified industrial mechanics or millwrights upon successful completion of the interprovincial Red Seal examination.

Related College & University Programs

Industrial Mechanical Millwright Technician (Certificate, Diploma)
Welding Techniques (Diploma)

EARNINGS: 33,000-77,000



Heavy-Duty Equipment Mechanics

NOC 7312

Heavy-duty equipment mechanics repair, troubleshoot, adjust, overhaul and maintain mobile heavy-duty equipment used in construction, transportation, forestry, mining, oil and gas, material handling, landscaping, land clearing, farming and similar activities. They are employed by companies which own and operate heavy equipment, and by heavy equipment dealers, rental and service establishments, and railway transport companies and urban transit systems.

Example Titles

Agricultural Equipment Technician / Construction Equipment Mechanic
Diesel Mechanic – Heavy Equipment / Farm Equipment Mechanic
Heavy Equipment Mechanic / Heavy Mobile Logging Equipment Mechanic
Heavy Mobile Mining Equipment Mechanic / Heavy-Duty Equipment Mechanic Apprentice
Heavy-Duty Equipment Technician
Locomotive Mechanic / Tractor Mechanic

Employment Requirements

Completion of secondary school is usually required.

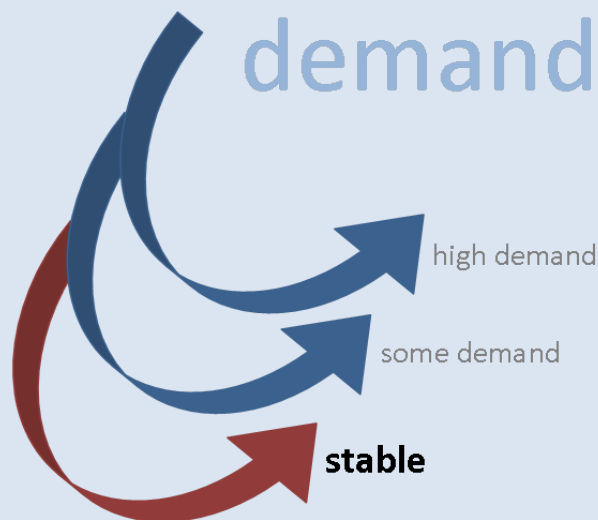
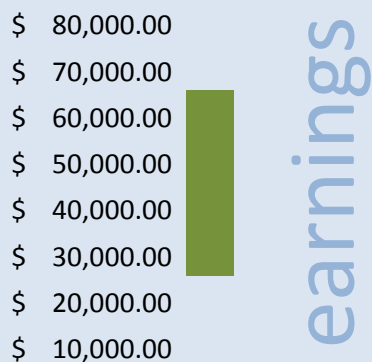
Completion of a 3-5 year apprenticeship program or a combination of over four years of work experience in the trade and some high school, college or industry courses in heavy equipment repair is usually required to be eligible for trade certification.

Red Seal endorsement is also available to qualified heavy duty equipment technicians and agricultural equipment technicians upon successful completion of the interprovincial Red Seal examination.

Related College & University Programs

Heavy Duty Equipment Mechanic (College)
Heavy Duty Equipment Technician (College)
Heavy Equipment Techniques (College)
Truck And Coach Technician (College)

EARNINGS: 31,000-69,000



Heavy Equipment Operators (Except Crane)

NOC 7421

Heavy equipment operators operate heavy equipment used in the construction and maintenance of roads, bridges, airports, gas and oil pipelines, tunnels, buildings and other structures; in surface mining and quarrying activities; and in material handling work. They are employed by construction companies, heavy equipment contractors, public works departments and pipeline, logging, cargo-handling and other companies.

Example Titles

- Backhoe Operator
- Bulldozer Operator
- Excavator Operator
- Gradall Operator
- Grader Operator
- Heavy Equipment Operator
- Heavy Equipment Operator Apprentice
- Loader Operator – Construction
- Side Boom Tractor Operator
- Surface Mining Equipment Operator

Employment Requirements

Some secondary school education is required.

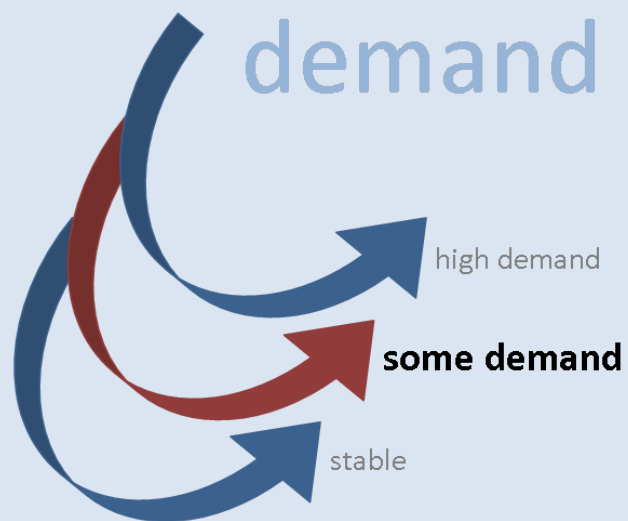
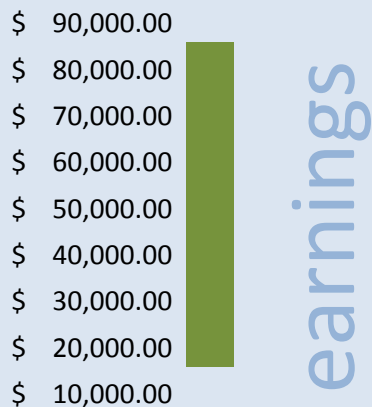
Completion of a 1-2 year apprenticeship program or some high school, college or industry courses in heavy equipment operating combined with on-the-job training are required.

Internal company certification may be required by some employers.

Related College & University Programs

- Heavy equipment operator (College)
- Power Engineering Technology (College)

EARNINGS: 20,000-80,000



Crane Operators

NOC 7371

Crane operators operate cranes or draglines to lift, move, position or place machinery, equipment and other large objects at construction or industrial sites, ports, railway yards, surface mines and other similar locations. They are employed by construction, industrial, mining, cargo handling and railway companies.

Example Titles

Boom Truck Crane Operator / Bridge Crane Operator / Climbing Crane Operator
Construction Crane Operator / Crane Operator / Dragline Crane Operator
Gantry Crane Operator / Hoist Operator (Except Underground Mining)
Mobile Crane Operator / Tower Crane Operator / Tractor Crane Operator

Employment Requirements

Completion of secondary school is usually required.

Completion of a 1-3 year apprenticeship program or high school, college or industry courses in crane operating are usually required.

Mobile crane operator trade certification is compulsory in Nova Scotia, Quebec, Ontario, Manitoba and Alberta and available.

Tower crane operator trade certification is compulsory in Nova Scotia, Quebec, Ontario and Manitoba and available, but voluntary, in Prince Edward Island.

Hoist operator trade certification, for specified types of cranes, is compulsory in Quebec, Ontario, Manitoba and Alberta.

Mobile crane operators may require a provincial licence to drive mobile cranes on public roads.

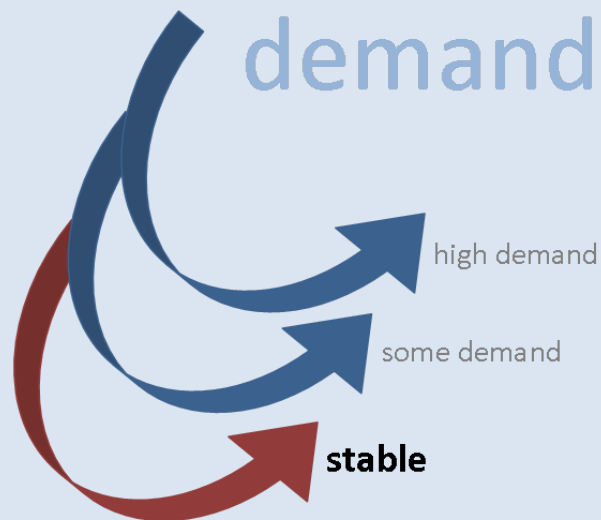
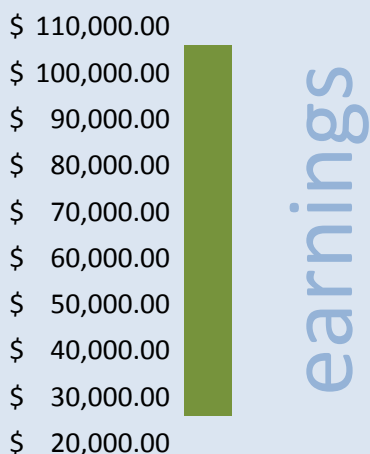
Internal company certification as a crane operator may be required by some employers.

Red Seal endorsement is also available to qualified mobile crane, tower crane and mobile crane (hydraulic) operators upon successful completion of the interprovincial Red Seal examination.

Related College & University Programs

Construction and Hoisting Techniques (College)
Mobile Crane Operator Apprenticeship (College)

EARNINGS: 30,000-100,000



Drillers and Blasters

Surface Mining, Quarrying and Construction

NOC 7372

Drillers in this unit group operate mobile drilling machines to bore blast holes in open-pit mines and quarries and to bore holes for blasting and for building foundations at construction sites. Blasters in this unit group fill blast holes with explosives and detonate explosives to dislodge coal, ore and rock or to demolish structures. They are employed by mining, quarrying and construction companies and by drilling and blasting contractors.

Example Titles

Blaster – Quarrying
Blaster – Surface Mining
Blaster, Construction
Driller – Surface Mine
Driller, Construction
Open-Pit Blaster
Rotary Drilling Machine Operator

Employment Requirements

Completion of secondary school is usually required.

On-the-job training is provided.

Experience as a heavy equipment operator may be required for drillers.

Experience as a blaster helper in surface mining and quarrying or construction may be required for blasters.

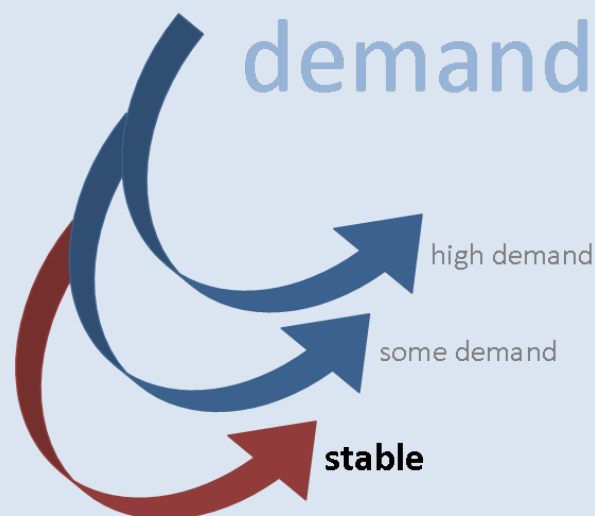
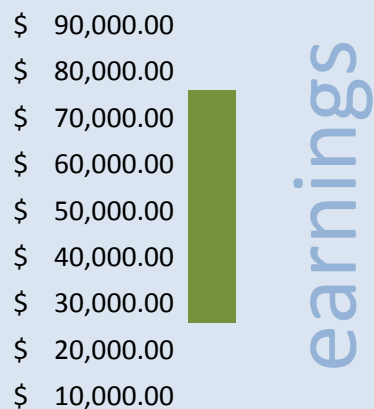
Provincial blasting licence is usually required for blasters.

Trade certification for blasters is available, but voluntary, in New Brunswick and Ontario.

Related College & University Programs

Blasting Techniques (College)

EARNINGS: 37,000-67,000



Transport Truck Drivers

NOC 7411

Transport truck drivers operate heavy trucks to transport goods and materials over urban, interurban, provincial and international routes. They are employed by transportation, manufacturing, distribution and moving companies, and trucking employment service agencies, or they may be self-employed. This unit group also includes drivers of special purpose trucks and shunters who move trailers to and from loading docks within trucking yards or lots.

Example Titles

Bulk Goods Truck Driver / Dump Truck Driver / Flatbed Truck Driver
Logging Truck Driver / Long Haul Truck Driver / Moving Van Driver
Shunt Truck Driver / Tow Truck Driver / Transport Driver
Truck Driver / Truck Driver, Heavy Truck / Truck Driver, Tractor-Trailer

Employment Requirements

Completion of secondary school is usually required.

On-the-job-training is provided.

Completion of an accredited driver training course of up to three months duration, through a vocational school or community college, may be required.

A Class 3 or D licence is required to drive straight-body trucks.

A Class 1 or A licence is required to drive long combination vehicles.

Air brake endorsement (Z) is required for drivers who operate vehicles equipped with air brakes.

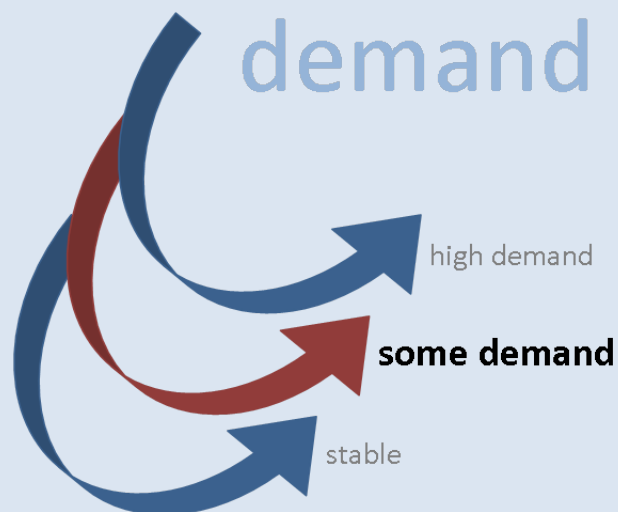
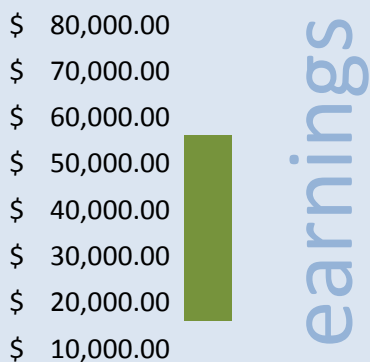
Transportation of dangerous goods (TDG) certification is required for drivers who transport hazardous products or dangerous goods.

Additional licensing endorsement or certification may be required to drive articulated trucks.

Related College & University Programs

Transportation operations specialist (Certificate)

EARNINGS: 27,000-57,000



Material Handlers

NOC 7452

This unit group includes workers who handle, move, load and unload materials by hand or using a variety of material handling equipment. They are employed by transportation, storage and moving companies, and by a variety of manufacturing and processing companies and retail and wholesale warehouses.

Example Titles

- Bin Filler
- Coal Handler
- Conveyor Console Operator
- Forklift Truck Operator
- Freight Handler (Except Air Transport)
- Furniture Mover
- Lumber Piler – Building Supplies
- Material Handler
- Railway Car Loader
- Stockpiler
- Storage Worker – Material Handling
- Truck Loader
- Warehouseman/Woman

Employment Requirements

Some secondary school education may be required.

Physical strength is required for manual material handlers who work with heavy materials.

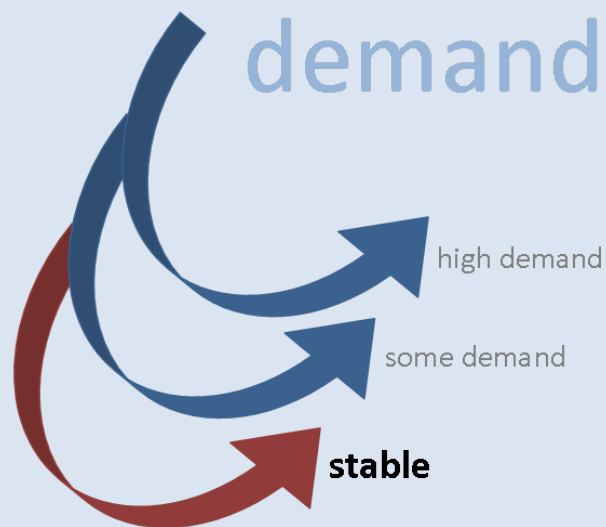
Related College & University Programs

Transportation operations specialist (Certificate)

EARNINGS: 23,000-67,000

- \$ 80,000.00
- \$ 70,000.00
- \$ 60,000.00
- \$ 50,000.00
- \$ 40,000.00
- \$ 30,000.00
- \$ 20,000.00
- \$ 10,000.00

earnings



Underground Production and Development Miners

NOC 8231

Underground production and development miners drill, blast, operate mining machinery, and perform related duties to extract coal and ore in underground mines and to construct tunnels, passageways and shafts to facilitate mining operations. They are employed by coal, metal and non-metallic mineral underground mines and by specialized contractors in mine construction, shaft sinking and tunnelling.

Example Titles

- Blaster – Underground Mining / Chute Blaster – Underground Mining
- Diamond Driller – Underground Mining / Drift Miner
- Driller – Underground Mining / Hardrock Miner Apprentice
- Hoist Operator – Underground Mining / Miner / Mining Machine Operator
- Powderman/Woman – Underground Mining
- Raise Miner / Roadheader Operator / Scooptram Operator / Shaft Inspector

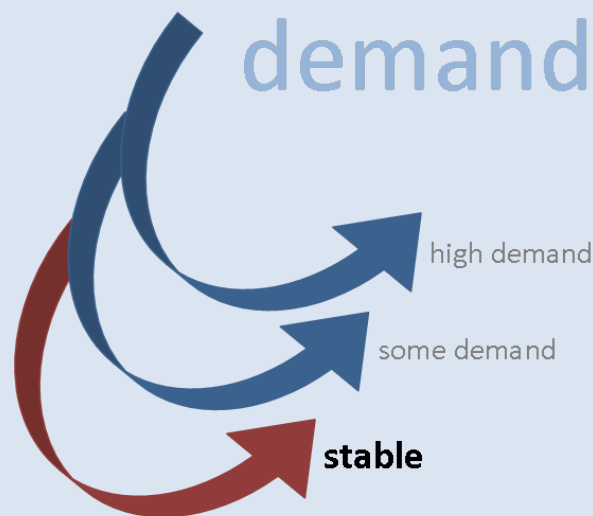
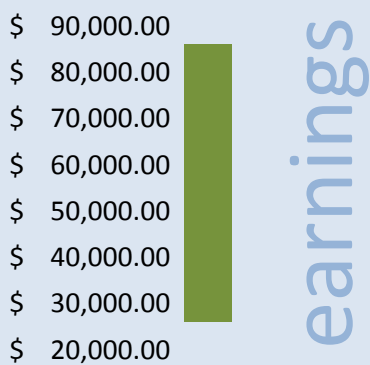
Employment Requirements

- Completion of secondary school is usually required.
- Formal training of up to six weeks followed by extended periods of specialized training as a helper or in support occupations is usually provided.
- Previous experience as a mine labourer or in other mine occupations is usually required.
- Provincial blasting licence may be required.
- May be certified in the basic common core program or as an underground hard rock miner in Ontario.
- Company licensing or certification is often required for occupations in this unit group.
- Certificate in first aid may be required.

Related College & University Programs

- Mining Engineering (Undergraduate)
- Blasting Techniques (Diploma)
- Geological Science (Undergraduate)
- Construction Technician in Mining and Civil Engineering (Diploma)

EARNINGS: 31,000-83,000



Underground Mine Service and Support Workers

NOC 8411

Underground mine service and support workers perform a range of duties related to the operation of ore passes, chutes and conveyor systems, the construction and support of underground structures, passages and roadways, and the supply of materials and supplies to support underground mining. They are employed by coal, metal and non-metallic mineral mines.

Example Titles

- Backfiller – Underground Mining / Blaster Helper – Underground Mining
- Cage Tender / Conveyor Operator – Underground Mining
- Crusher Operator – Underground Mining / Driller Helper – Underground Mining
- Haulage Man-Woman – Underground Mining / Lamp Keeper – Underground Mining
- Material Man-Woman – Underground Mining / Mine Construction Worker
- Ore Pass Tender – Underground Mining / Pipeworker – Underground Mining
- Raise Miner Helper / Skip Tender
- Timberman-Woman – Underground Mining / Trainman-Woman – Underground Mining

Employment Requirements

Completion of secondary school is usually required.

Previous formal training of up to six weeks followed by periods of on-the-job training as a helper or in support occupations is usually required.

Previous experience as a mine labourer is usually required.

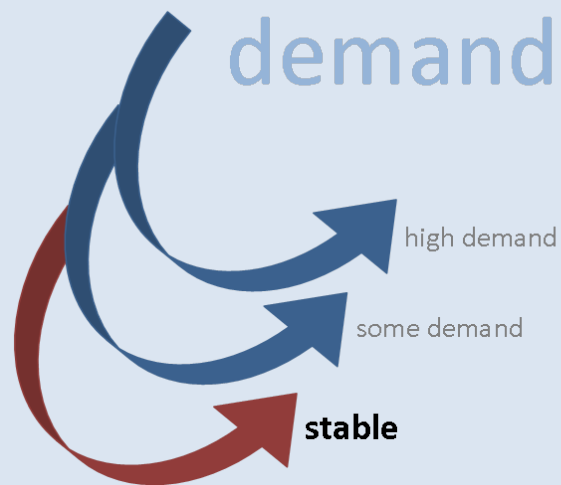
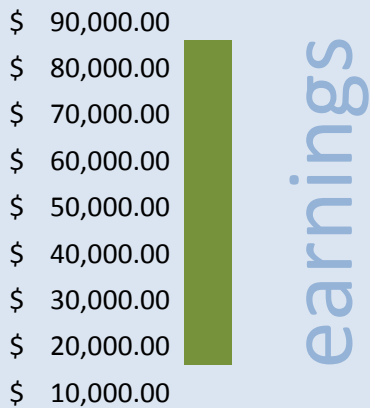
May be certified in the basic common core program in Ontario.

Company licensing or certification is often required for occupations in this unit group.

Related College & University Programs

- Mining Engineering (Undergraduate)
- Blasting Techniques (Diploma)
- Geological Science (Undergraduate)
- Construction Technician in Mining and Civil Engineering (Diploma)

EARNINGS: 21,000-87,000



Mine Labourers

NOC 8614

Mine labourers carry out a variety of general labouring duties to assist in the extraction of coal, minerals and ore, and in other services in support of underground mining. They are employed by coal, metal and non-metallic mineral mines.

Example Titles

- Chute Puller
- Mine Helper
- Mine Labourer
- Miner Helper – Underground Mining
- Pit Scaler – Underground Mining
- Shoveller – Underground Mining
- Underground Labourer – Mining

Employment Requirements

Completion of secondary school is usually required.
A short period of introductory training is provided.
In Ontario, mine labourers are registered in the basic common core program.

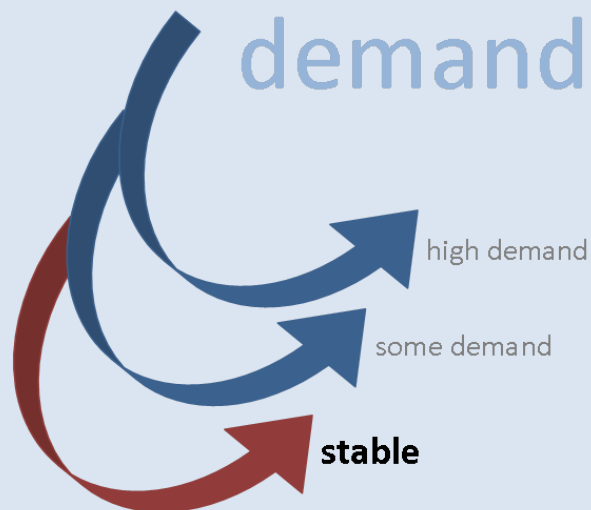
Related College & University Programs

- Blasting Techniques (Diploma)
- Construction Technician in Mining and Civil Engineering (Diploma)

EARNINGS: 30,000-57,120

- \$ 80,000.00
- \$ 70,000.00
- \$ 60,000.00
- \$ 50,000.00
- \$ 40,000.00
- \$ 30,000.00
- \$ 20,000.00
- \$ 10,000.00

earnings



Central Control and Process Operators, Mineral and Metal Processing

NOC 9231

Central control and process operators, mineral and metal processing, operate and monitor multi-function process control machinery and equipment to control the processing of mineral ores, metals or cement. They are employed in mineral ore and metal processing plants such as copper, lead and zinc refineries, uranium processing plants, steel mills, aluminum plants, precious metal refineries and cement processing plants.

Example Titles

Blast Furnace Operator
Central Control Caster
Central Control Room Operator – Primary Metal Processing
Chief Flotation Operator
Console Operator – Cement Manufacturing
Pelletizing Control Operator
Roaster Operator – Primary Metal Processing
Rolling Mill Control Operator

Employment Requirements

Completion of secondary school is required.

A college diploma may be required for some positions in this group.

On-the-job training is provided.

Several years of experience as a machine or process operator, usually in the same company or production department, are required.

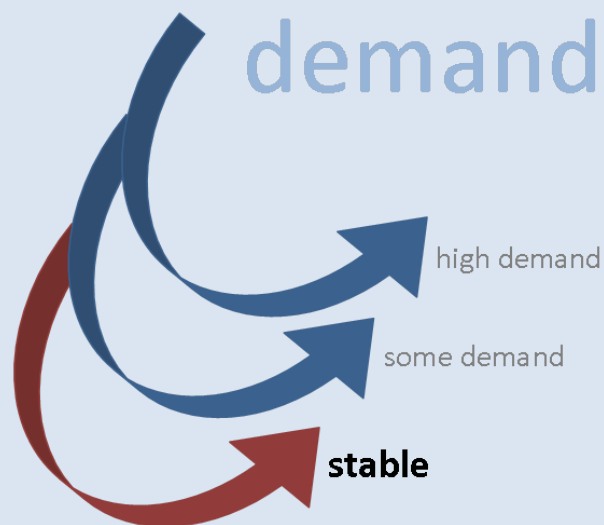
Related College & University Programs

Computer Science (Diploma)
Environmental Biology (Undergraduate)

EARNINGS: 32,000-65,000

\$ 80,000.00
\$ 70,000.00
\$ 60,000.00
\$ 50,000.00
\$ 40,000.00
\$ 30,000.00
\$ 20,000.00
\$ 10,000.00

earnings



Machine Operators, Mineral and Metal Processing

NOC 9411

Workers in this unit group operate single-function machines or machinery that is part of a larger production process to process mineral ore and metal products. They are employed in mineral ore and metal processing plants such as copper, lead and zinc refineries, uranium processing plants, steel mills, aluminum plants, precious metal refineries and cement processing plants.

Example Titles

- Aluminum Classifier / Asbestos Dryer
- Billet Heater / Brick and Tile Crusher Operator
- Cement Miller / Extrusion Press Operator
- Foil-Winding Machine Operator
- Furnace Charger – Mineral And Metal Processing
- Ladle Pourer / Lead Refiner
- Lime Kiln Operator / Mica Sheet Laminator
- Quenching Car Operator / Scrap Metal Shredder
- Sintering Machine Operator / Slurry Equipment Operator
- Steel Roller / Uranium Classifier Operator
- Zinc Cell Operator

Employment Requirements

Completion of secondary school is usually required.

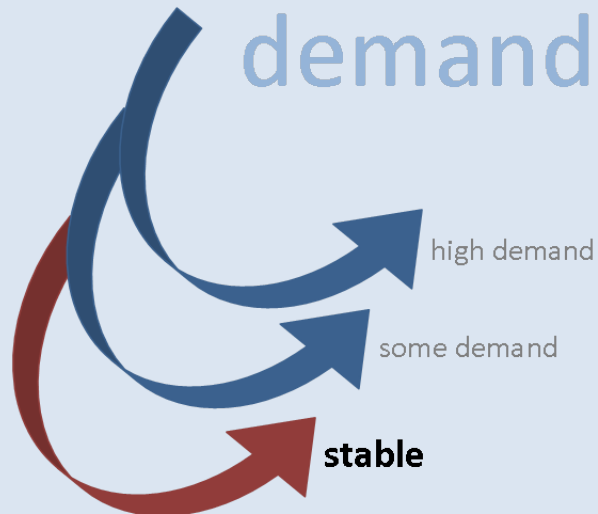
On-the-job training is provided.

Experience as a labourer in mineral and metal processing is usually required for machine operators.

EARNINGS: 38,000-73,000

- \$ 90,000.00
- \$ 80,000.00
- \$ 70,000.00
- \$ 60,000.00
- \$ 50,000.00
- \$ 40,000.00
- \$ 30,000.00
- \$ 20,000.00
- \$ 10,000.00

earnings



Labourers in Mineral and Metal Processing

NOC 9611

Labourers in this unit group perform material handling, clean-up, packaging and other elemental activities related to mineral ore and metal processing. They are employed in mineral ore and metal processing plants such as copper, lead and zinc refineries, uranium processing plants, steel mills, aluminum plants, precious metal refineries, cement processing plants, clay, glass and stone processing plants and foundries.

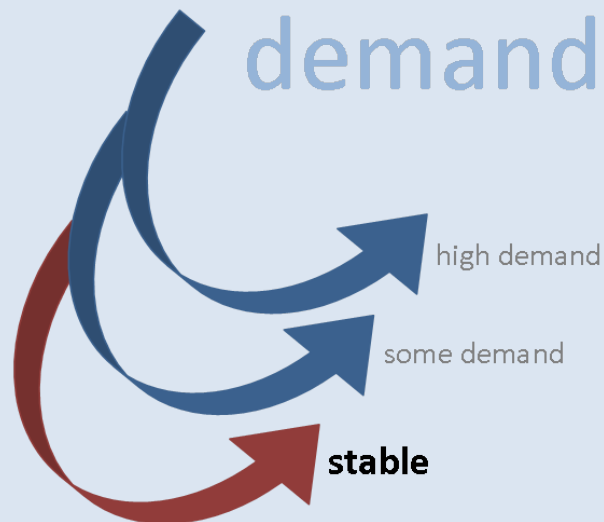
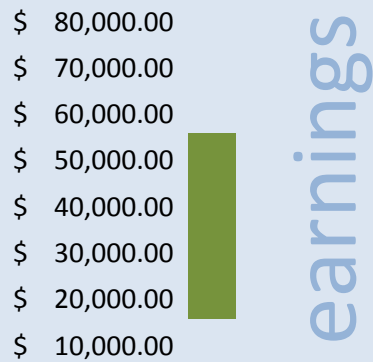
Example Titles

- Asbestos Worker – Mineral Processing
- Brick And Tile Kiln Cleaner
- Core Shop Labourer – Foundry
- Extrusion Helper – Primary Metal Processing
- Furnace Loader – Primary Metal And Mineral Products Processing
- Glass Packer
- Helper, Fibreglass Oven Charger
- Lime Kiln Operator Helper – Mineral Products Processing
- Metal Pourer Helper
- Rolling Mill Worker – Primary Metal Processing
- Salt Screening Labourer
- Tailings Disposal Labourer – Primary Metal Processing

Employment Requirements

Completion of secondary school may be required for some positions in this group.

EARNINGS: 25,000-52,000



Additional Resources

www.esdc.gc.ca

ESDC's (Employment and Social Development Canada) mission is to build a stronger and more competitive Canada, to support Canadians in making choices that help them live productive and rewarding lives, and to improve Canadians' quality of life.

www.canlearn.ca

CanLearn.ca provides Canadians with the information and services they need to decide what and where to study and how to cover the costs.

We strive to deliver trusted, useful and comprehensive information and services to help Canadians save, plan and pay for their education. Our goal is to provide all the necessary resources (from interactive tools to information about education savings programs, student loans and scholarships) to Canadians facing important decisions about what to study, where to study and how to save for and pay for education after high school.

Ontario Skills Passport

The Ontario Skills Passport (OSP) provides clear descriptions of Essential Skills and work habits important for success in work, learning and life. Learners can use the OSP tools and resources to assess, build, document and track their skills in classroom, cooperative education and other experiential learning opportunities, volunteer and extracurricular activities.

Ontario Ministry of Training, Colleges and Universities - Labour Markets

www.tcu.gov.on.ca

The Ministry of Training, Colleges and Universities provides labour market information to help individuals and businesses make informed decisions about careers, education, employment, and business plans.

Data and analysis of trends in the labour market provide valuable insights into labour market conditions and trends in Ontario, as well as in specific regions or communities.

Labour market information helps individuals determine which occupations suit their aptitudes and interests, where the jobs are, and which occupations have the best prospects. It also helps people locate the most appropriate training and educational resources.

www.workingincanada.gc.ca

Job Bank is the Government of Canada's leading source for jobs and labour market information. It offers users free occupational and career information such as job opportunities, educational requirements, main duties, wage rates and salaries, current employment trends, and outlooks.



**EMPLOYMENT
ONTARIO**

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