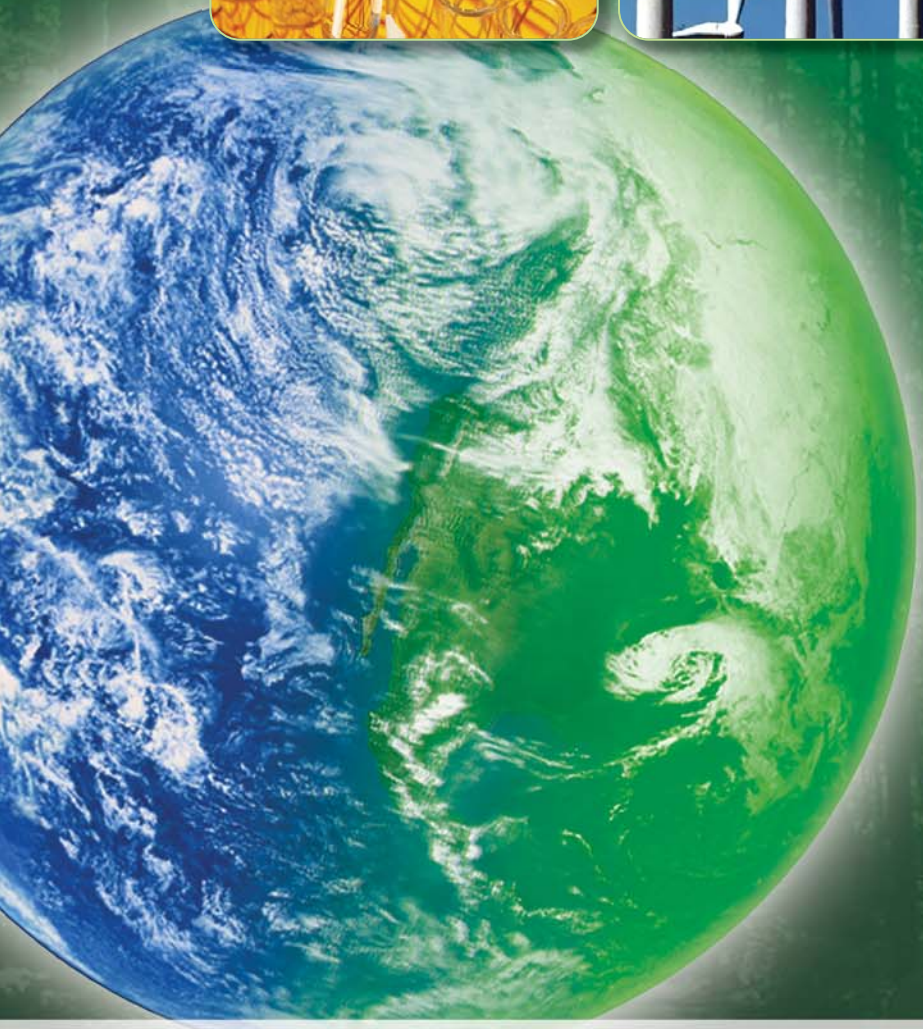
Greening the Economy



Transitioning to New Careers

INFORMATION COMMUNICATION TECHNOLOGY

CAREER PROFILES

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EMPLOYMENT ONTARIO

Educational Flow Chart

HIGH SCHOOL

COLLEGE

- **Engineering**
  - Biochemical, Chemical, Civil, Computer Engineering, Design and Drafting Engineering, Construction, Electrical/Electronics, Engineering Technology, Mechanical
    - Technical Occupations related to Natural and Applied Sciences
      - Chemical Technologists and Technicians, Geological and Mineral Technologists and Technicians, Biological Technologists and Technicians, Forestry Technologists and Technicians, Landscape and Horticulture Technicians and Specialists, Civil Engineering Technologists and Technicians, Mechanical Engineering Technologists and Technicians, Electrical and Electronics Engineering Technologists and Technicians, Drafting Technologists and Technicians, Land Survey Technologists and Technicians, Inspectors in Public and Environmental Health and Occupational Health and Safety, Construction Inspectors, Mapping and Related Technologists and Technicians
- **Social Science**
  - Business, Commerce, Sales
    - Skilled Sales and Service Occupations
      - Technical Sales Specialists – Wholesale Trade
- **Science & Technology**
  - Agronomy, Architecture, Biology, Environmental Studies, Food Sciences, Forestry Technology, Geographic Surveying, Health & Safety, Horticulture, Petroleum Technology, Survey Technology
- **Trades**
  - Carpentry, Chemical Processing, Electrician Apprenticeship, Machining, Refrigeration and Air Conditioning Repair
    - Trades and Skilled Transport and Equipment Operators
      - Contractors and Supervisors, Other Construction Trades, Installers, Repairers and Servicers, Machinists and Machining and Tooling Inspectors, Electricians (Except Industrial and Power System), Carpenters, Refrigeration and Air Conditioning Mechanics, Stationary Engineers and Auxiliary Equipment Operators
    - Processing, Manufacturing and Utilities Supervisors and Skilled Operators
      - Supervisors, Petroleum, Gas and Chemical Processing and Utilities

WORKPLACE

- **On-the-job Training**
  - Clerical Occupations
    - Customer Service, Information and Related Clerks, Shippers and Receivers
  - Intermediate Sales and Service Occupations
    - Retail Sales Persons and Sales Clerks
  - Intermediate Occupations in Transport, Equipment Operation, Installation and Maintenance
    - Material Handlers
  - Processing and Manufacturing Machine Operators and Assemblers Assemblers
    - Rubber Processing, Machine Operators and Related Workers, Water and Waste Plant Operators, Plastics Processing Machine Operators, Motor Vehicle Assemblers, Inspectors, and Testers, Machining Tool Operators
  - Trades Helpers, Construction Labourers and Related Occupations
    - Construction Trades Helpers and Labourers
  - Labourers in Processing, Manufacturing and Utilities
    - Other Labourers in Processing, Manufacturing and Utilities

UNIVERSITY

- **Engineering**
  - Chemical, Civil, Computer Systems, Electrical or Electronics, Mechanical
    - Professional Occupations in Natural and Applied Sciences
      - Chemists, Geologists, Geochemists and Geophysicists, Biologists and Related Scientists, Agricultural Representatives, Consultants and Specialists, Civil Engineers, Mechanical Engineers, Electrical and Electronics Engineers, Chemical Engineers, Urban and Land Use Planners, Information Systems Analysts and Consultants
- **Science**
  - Agriculture, Chemistry, Computer Science, Biochemistry, Biology, Geology, Geophysics
    - Professional Occupations in Social Science, Education, Government Services and Religion
      - Natural and Applied Science Policy Researchers, Consultants and Program Officers, Natural and Applied Science Policy Researchers, Consultants and Program Officers, Business Development Officers and Marketing Researchers and Consultants
- **Social Science**
  - Urban and Regional Planning, Geography, Economics, Business, Commerce

Computer Programmers and Interactive Media Developers

NOC 2174

Computer programmers write, modify, integrate and test computer code for microcomputer and mainframe software applications, data processing applications, operating systems-level software and communications software. Interactive media developers write, modify, integrate and test computer code for Internet applications, computer-based training software, computer games, film, video and other interactive media. They are employed in computer software development firms, information technology consulting firms, and in information technology units throughout the private and public sectors.[1]

Places of Employment[1]:

- Computer systems design and related services
- Software publishers
- Finance and insurance companies
- Public administration

Employment Requirements[1]:

- A bachelor's degree in computer science or in another discipline with a significant programming component or completion of a college program in computer science is usually required
- Specialization in programming for engineering and scientific applications requires specific post-secondary study or experience

Local Educational Programs:

Program	Length	Certification	Institutions
Computer Engineering	4 years	Bachelors Degree	Ryerson University, University of Toronto, York University
Computer Engineering Technology	3 years	College Diploma	Centennial College, Humber College, Sheridan College, Seneca College
Computer Programmer	2 years	College Diploma	Humber College, Sheridan College, Seneca College
Computer Programmer Analyst	3 years	College Diploma	George Brown College, Seneca College
Computer Science	4 years	Bachelors Degree	Ryerson University, University of Toronto, York University
Computer Systems Technician/Technology	2 years - 3 years	College Diploma	Centennial College, George Brown College, Sheridan College, Seneca College
Software Engineering	4 years	Bachelors Degree	University of Toronto, York University
Software Engineering Technician/Technology	2 years - 3 years	College Diploma	Centennial College

The most important Essential Skills for this occupation are[2]:

- Problem Solving
- Computer use
- Continuous learning

Number of Employees by Age Range[3]:

Employees by Age Range	Peel Halton	Toronto	York Region Brad WG	Total
15 – 24 years	390	920	385	1,695
25 – 44 years	3,455	11,100	3,570	18,125
45 years and over	1,245	3,655	1,215	6,115
Total Employees	5,090	15,675	5,170	25,935
% 45 years +	24.46%	23.32%	23.50%	23.58%

Source: Statistics Canada, 2006 Census

Average Salary

Average Salary based on 2006 Census Data[3]	
Peel Halton	$ 68,170
Toronto	$ 64,551
York Region Brad WG	$ 69,996
Ontario	$ 66,604

Computer Programmers and Interactive Media Developers

NOC 2174

Top Industries of Employment for 3 regions[3]:

Across all three regions, there are 25,935 computer programmers and interactive media developers employed. The top industries of employment are:

Industry (NAICS)	Number of People Employed	% of Total
541 Professional, scientific and technical services	12,205	47.06%
522 Credit intermediation and related activities	2,570	9.91%
511 Publishing industries (except Internet)	1,650	6.36%

Source: Statistics Canada, 2006 Census; Statistics Canada. Canadian Business Patterns Data. December 2003, June 2009.

Related Occupations[1]:

- Computer Network Technicians (NOC 2281)
- Database Analysts and Data Administrators (NOC 2172)
- E-business managers (NOC 0611)
- Graphic Designers and Illustrators (NOC 5241)
- Information Systems Analysts and Consultants (NOC 2171)
- Software Engineers and Designers (NOC 2173)
- Systems Testing Technicians (NOC 2283)
- Web Designers and Developers (NOC 2175)

Local Employers:

The following list of employers was randomly selected as examples of companies employing this occupation. An attempt was made to represent a company from each local board area.

AGM Automation Systems Inc.
4610 Dufferin Street
Toronto, ON M3H 5S4
www.agmautomation.com

Rogers Communications
333 Bloor Street East
Toronto, ON, M4W 1G9
www.rogers.ca

NetApp
100 Milverton Dr., Suite 404
Mississauga, ON L5R 4H1
www.netapp.com

For a more complete listing of potential employers please visit www.labourmarketinformation.ca.

ENDNOTES

[1]Human Resources Skills Development Canada. National Occupational Classification System 2006. www5.hrsdc.gc.ca/NOC.

[2]Human Resources Skills Development Canada. Essential Skills Profiles. www.hrsdc.gc.ca/eng/workplaceskills/essential_skills/general/home.shtml

[3]Statistics Canada. 2006 Census. www.statcan.gc.ca.

Information Systems Analysts and Consultants

NOC 2171

Information systems analysts and consultants conduct research, develop and implement information systems development plans, policies and procedures, and provide advice on a wide range of information systems issues.[1]

Places of Employment[1]:

- Information technology consulting firms
- Information technology units throughout public and private sectors
- Self employed

Employment Requirements[1]:

- A bachelor's degree in computer science, computer systems engineering, software engineering, business administration or a related discipline or completion of a college program in computer science is usually required
- Experience as a computer programmer is usually required
- Certification or training provided by software vendors may be required by some employers

Local Educational Programs:

Program	Length	Certification	Institutions
Computer Science	4 years	Bachelor of Computer Science	Ryerson University, University of Toronto, York University
Electrical Engineering	4 years, 5 year Industrial Internship Program	Bachelor of Engineering	Ryerson University
Electronics Engineering Technician/Technology	2 years (technician) 3 years (technology)	Diploma Advanced Diploma	Centennial College, Humber College, Seneca College, Sheridan College
Electromechanical Engineering Technician/Technology	2 years regular 3 years Co-op	Diploma Advanced Diploma	Centennial College, George Brown College, Sheridan College

The most important Essential Skills for this occupation are[2]:

- Computer use
- Reading text
- Writing
- Document use
- Oral communication

The most important High School subjects are[3]:

- Computer related courses
- Industrial arts
- Math
- Business

Number of Employees by Age Range[4]:

Employees by Age Range	Peel Halton	Toronto	York Region Brad WG	Total
15 – 24 years	515	940	365	1,820
25 – 44 years	7,885	13,745	5,700	27,330
45 years and over	3,565	5,695	3,360	12,620
Total Employees	11,965	20,380	9,425	41,770
% 45 years +	29.80%	27.94%	35.65%	30.21%

Source: Statistics Canada, 2006 Census

Average Salary

Average Salary based on 2006 Census Data[4]	
Peel Halton	$ 73,258
Toronto	$ 69,368
York Region Brad WG	$ 74,453
Ontario	$ 71,252

Information Systems Analysts and Consultants

NOC 2171

Top Industries of Employment for 3 regions[4,5]:

Across all three regions there are 41,770 information systems analysts and consultants employed. The top industries of employment are:

Industry (NAICS)	Number of People Employed	% of Total	Number of Employers Dec 2003	Number of Employers Jun 2009	Absolute Change % 03 - 09	Change 03 – 09
541 Professional, scientific and technical services	18,480	44.23%	76,758	77,367	609	0.79%
522 Credit intermediation and related activities	5,525	13.22%	4,745	4,119	-626	-13.19%
417 Machinery, equipment and supplies wholesaler-distributors	2,770	6.63%	6,146	5,567	-579	-9.42%

Source: Statistics Canada, 2006 Census; Statistics Canada. Canadian Business Patterns Data. December 2003, June 2009.

Matrix of Skills Transferability:

Transferability between occupations has been analyzed using the National Occupational Coding system. Judgments have been made based on an analysis of available information regarding the overlap of knowledge and skills and labour market hiring practices for occupations. Occupations to which transferability exists are:

There are no direct occupations linked to this occupation based on the matrix of skills transferability. However, the following have been identified as related occupations:

- Computer Engineers (Except Software Engineers and Designers) (NOC 2147)
- Software Engineers and Designers (NOC 2173)
- Computer Programmers and Interactive Media Developers (NOC 2174)
- Web Designers and Developers (NOC 2175)

Local Employers:

The following list of employers was randomly selected as examples of companies employing this occupation. An attempt was made to represent a company from each local board area.

Mico Systems Inc.
740 Weller Court, Unit A
Oakville, Ontario L6K 3S9
Telephone: 1 905 842 2994
Fax: 1 905 842 3936
www.micosystems.com

Voloper Creations Inc.
3100 Steeles Avenue West, Suite 400
Concord, Ontario L4K3R1
Telephone: 1 905 660 1481 ext. 226
Fax: 1 905 660 6053
www.voloper.com

Perpetual Connections
1852 Queen street E, Unit 200
Toronto, Ontario M4L 1H1
Telephone: 1 416 482 2854 ext. 3
Fax: 1 416 621 6555
www.perpetualconnections.com

For a more complete listing of potential employers please visit www.labourmarketinformation.ca.

ENDNOTES

[1]Human Resources Skills Development Canada. National Occupational Classification System 2006. www5.hrsdc.gc.ca/NOC.

[2]Human Resources Skills Development Canada. Essential Skills Profiles. www.hrsdc.gc.ca/eng/workplaceskills/essential_skills/general/home.shtml

[3]Service Canada. Job Futures – National Edition. 2007. www.jobfutures.ca.

[4]Statistics Canada. 2006 Census. www.statcan.gc.ca.
Note: These salaries represent an average of both unionized and non-unionized workers. Salaries may vary by workplace.

[5]Statistics Canada. Canadian Business Patterns Data. December 2003, June 2009. www.statcan.gc.ca.

[6]Human Resources Skills Development Canada. Matrix of Skills Transferability – January 2003. www.hrsdc.gc.ca.

Lawyers' and Quebec Notaries

NOC 4112

Lawyers and Quebec notaries advise clients on legal matters, represent clients before administration boards and draw up legal documents such as contracts and wills. Lawyers also plead cases, represent clients before tribunals and conduct prosecutions in courts of law. Lawyers are employed in law firms and prosecutor's offices. Quebec notaries are employed in notary offices. Both lawyers and Quebec notaries are employed by federal, provincial and municipal governments and various business establishments or they may be self-employed. Articling students are included in this group[1]

Places of Employment[1]:

- Federal, provincial and municipal governments
- Self-employment
- Law firms
- Notary offices
- Various business establishments

Employment Requirements[1]:

- Lawyers require two to three years of undergraduate studies or, in Quebec, completion of college program and a bachelor's degree from a recognized law school and successful completion of the bar examination and completion of a period of articling are required
- Licensing by the provincial or territorial law society is required
- Quebec Notaries require a bachelor's degree from a recognized law school and a Diploma of Notarial Law (D.D.N.) or a master's degree of law with specialization in notarial law and a 32-week vocational training program are required
- Registration with the Corporation of Notaries is required

Local Educational Programs:

Program	Length	Certification	Institutions
Law	4 years	Degree	York University
Law and Society	4 years	Degree	York University
Masters of Law	1 year	Degree	University of Toronto

The most important Essential Skills for this occupation are[2]:

- Oral communication
- Working with others
- Continuous learning
- Thinking skills

Number of Employees by Age Range[3]:

Employees by Age Range	Peel Halton	Toronto	York Region Brad WG	Total
15 – 24 years	15	120	10	145
25 – 44 years	860	8,980	515	10,355
45 years and over	855	6,905	600	8,360
Total Employees	1,730	16,005	1,125	18,860
% 45 years +	49.42%	43.14%	53.33%	44.33%

Source: Statistics Canada, 2006 Census

Average Salary

Average Salary based on 2006 Census Data[3]	
Peel Halton	$157,295
Toronto	$209,474
York Region Brad WG	$143,020
Ontario	$167,714

Lawyers' and Quebec Notaries

NOC 4112

Top Industries of Employment for 3 regions[3]:

Across all three regions, there are 8,260 securities agents, investment dealers and brokers employed. The top industries of employment are:

Industry (NAICS)	Number of People Employed	% of Total
541 Professional, scientific and technical services	14,610	77.47%
912 Provincial and territorial public administration	1,515	8.03%

Source: Statistics Canada, 2006 Census; Statistics Canada. Canadian Business Patterns Data. December 2003, June 2009.

Related Occupations[1]:

- Legal department directors (NOC 0114)
- Legal firm managers (NOC 0123)
- Patent agents who are not lawyers or Quebec notaries (NOC 4161)
- Paralegal and related occupations (NOC 4211)

Local Employers:

The following list of employers was randomly selected as examples of companies employing this occupation. An attempt was made to represent a company from each local board area.

Hill Hunter Losell Law Firm LLP
17360 Yonge St.
Suite 200, P.O. Box 324
Newmarket, Ontario L3Y 4X7
www.hillhunterlosell.com

Cassels Brock & Blackwell LLP
2100 Scotia Plaza
40 King Street West
Toronto, Ontario M5H 3C2
www.casselsbrock.com

Keyser Mason Ball LLP
Four Robert Speck Parkway, Suite 1600
Mississauga, Ontario L4Z 1S1
www.kmblaw.com

For a more complete listing of potential employers please visit www.labourmarketinformation.ca.

ENDNOTES

[1]Human Resources Skills Development Canada. National Occupational Classification System 2006. www5.hrsdc.gc.ca/NOC.

[2]Human Resources Skills Development Canada. Essential Skills Profiles. www.hrsdc.gc.ca/eng/workplaceskills/essential_skills/general/home.shtml

[3]Statistics Canada. 2006 Census. www.statcan.gc.ca.

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