Key Research Findings

This analysis was based on the pre-determined criteria listed below:

Section	Description	Measures
Student Demand	Includes an assessment of OCAS (2007 - 2011) enrolment data at other colleges in terms of mean growth rate with a specific focus on Fleming's direct competitors where appropriate (Georgian, Sheridan, Seneca and Durham) Trends in certificate, diploma, degree, apprenticeship and continuing education (where available). **Click Below to Access Full Source Document:** Fall Enrollment Trend	• Strong = Fleming enrolment growth is outpacing system and is equal to or greater than 3% • Moderate = Fleming enrolment growth is equivalent to system demand and is between 1.0 to 2.9% • Weak = Fleming enrolment growth is less than the system demand and is less than 1%
Labour Market	Includes projected employment rate growth based on a consolidation of various Ontario, Canadian, and US sources including HRSDC, Sector Council Reports US Bureau of Labour Statistics, and the MTCU Employment Profile.	• Strong = Between 5-6 positive labour market indicators • Moderate = Between 3-5 positive labour market indicators • Weak = Between 1-2 or no positive labour market indicators
Competitive Analysis	Includes the number of actual colleges offering the program as well as the ratio of applications to acceptances at Fleming compared to other colleges and specific comment about Fleming's direct competitors where appropriate (Georgian, Sheridan, Seneca and Durham) **Click Below to Access Full Source Document:** Fall Conversion Report	• Strong = Fleming conversion ratio is greater than 2 below the system • Moderate = Fleming conversion ratio is 1 above, below or equal to the system • Weak = Fleming conversion ratio is greater than 2 above than the system
Financial Analysis	Includes a review of Contribution to Overhead (CTO) for existing programs (2010-11) **Click Below to Access Full Source Document:** Costing Analysis	• Strong = CTO is greater than 35% • Moderate = CTO is between 30 - 34% • Weak = CTO is between 20 – 30% **No Contribution = 19% or less**

Key Research Findings

Key Performance Indicators	Includes KPI trends from the Key Performance Indicator Summary 5 Year Historical Overview KPI Data from Reporting Years 2008-2012. **Click Below to Access Full Source Document:** Key Performance Indicators	• Strong = Above system average in 6-7 indicators • Moderate = Above system average in 3-5 indicators • Weak = Above system average in 0-2 indicators.
Resource Analysis	Requires school level assessment regarding space, technology, capital equipment and human resources. Recommendations from recent Program Review Reports included here	

Key Research Findings

Computer Engineering Technician/Technology (50509/60509)

Student Demand[1]	• STRONG / • MODERATE

The following information consists of OCAS yearly student fall registration data as well as a mean growth rate and average student registration for each program under these categories:

Certificate

- Centennial is the only school to offer this certificate program, which has experienced a mean growth rate of **11%** and an average registration of **16 students**

Diploma

- Eight colleges offer this program, including one of Fleming's main competitors
- Fleming has a **7%** mean growth rate, higher than the system rate of **3%**
- Sheridan, the key competitors, has a mean growth rate of **17%**
- Overall, Boreal has the highest mean growth rate **(50%)** and Northern has the lowest rate **(-24%)**
- Sheridan has the average registration with **14 students**
- Overall, Niagara has the highest average registration with **31 students** and Centennial the lowest with **7 students**

Advanced Diploma

- Twelve colleges offer this program, including two of Fleming's main competitors
- Fleming has a **9%** mean growth rate, slightly lower than the system rate of **10.7%**
- Out of the key competitors, Sheridan has a highest mean growth rate of **18%** and Seneca has the lowest **(-2%)**
- Overall, Northern has the highest mean growth rate **(38%)** and Niagara has the lowest growth rate **(-36%)**
- Out of the key competitors, Seneca has the highest average registration with **81 students** and Sheridan the lowest with **48 students**
- Overall, Algonquin has the highest average registration with **96 students** and Northern has the lowest with **10 students**

[1] Registration data obtained from the Program Counts by Applicant Type Report (RPT0050P) in the OCAS Reporting and Analytics Cube December 7, 2011. Some programs/colleges may not be included because they were missing MCU codes in the OCAS dataset Prepared by Fleming Data Research (07-2012)

Key Research Findings

Degree

- Sheridan is the only school to offer this program, which has experienced a mean growth rate of **6%** and an average registration of **22 students**

Certificate

Program: 40509 - COMPUTER REPAIR AND MAINTENANCE														
	2007	2008	% Change (07-08)	2008	2009	% Change (08-09)	2009	2010	% Change (09-10)	2010	2011	% Change (10-11)	% Mean Growth Rate (07-11)	5 Year Average Reg. Students
CENTENNIAL	21	14	-33	14	10	-29	10	13	30	13	23	77	11	16
Total	***21***	***14***	***-33***	***14***	***10***	***-29***	***10***	***13***	***30***	***13***	***23***	***77***		

Diploma

Program: 50509 - COMPUTER ENGINEERING TECHNICIAN														
	2007	2008	% Change (07-08)	2008	2009	% Change (08-09)	2009	2010	% Change (09-10)	2010	2011	% Change (10-11)	% Mean Growth Rate (07-11)	5 Year Average Reg. Students
CENTENNIAL	10	5	-50	5	8	60	8	8	0	8	3	-63	-13	7
COLLÈGE BORÉAL		7		7	16	129	16	23	44	23	18	-22	50	16
→ FLEMING	21	13	-38	13	27	108	27	26	-4	26	16	-38	7	21
NIAGARA	46	48	4	48	20	-58	20	20	0	20	19	-5	-15	31
NORTHERN					26		26	11	-58	11	12	9	-24	16
SAULT	12	19	58	19	13	-32	13	9	-31	9			-1	13
SHERIDAN	9	11	22	11	18	64	18	17	-6	17	15	-12	17	14
ST. LAWRENCE	13													13
Total	***111***	***103***	***-7***	***103***	***128***	***24***	***128***	***114***	***-11***	***114***	***83***	***-27***		

Key Research Findings

Advanced Diploma

Program: 60509 - COMPUTER ENGINEERING TECHNOLOGY														
	2007	2008	% Change (07-08)	2008	2009	% Change (08-09)	2009	2010	% Change (09-10)	2010	2011	% Change (10-11)	% Mean Growth Rate (07-11)	5 Year Average Reg. Students
ALGONQUIN	63	100	59	100	103	3	103	104	1	104	109	5	17	96
CENTENNIAL	18	18	0	18	17	-6	17	11	-35	11	16	45	1	16
CONESTOGA	21	37	76	37	46	24	46	52	13	52	42	-19	24	40
FLEMING	18	24	33	24	18	-25	18	18	0	18	23	28	9	20
HUMBER	34	46	35	46	51	11	51	50	-2	50	61	22	17	48
LA CITÉ COLLÉGIAL	13	19	46	19	15	-21	15	26	73	26	29	12	27	20
MOHAWK	45	61	36	61	66	8	66	65	-2	65	51	-22	5	58
NIAGARA	80	51	-36	51									-36	66
NORTHERN	8	11	38	11									38	10
SENECA	80	73	-9	73	88	21	88	93	6	93	69	-26	-2	81
SHERIDAN	34	49	44	49	46	-6	46	48	4	48	62	29	18	48
ST. LAWRENCE														
Total	***414***	***489***	***18***	***489***	***450***	***-8***	***450***	***467***	***4***	***467***	***462***	***-1***		

Degree

Program: 80509 - BACH OF APPLIED INFORMATION SCIENCES (INFORMATION SYSTEMS SECURITY)														
	2007	2008	% Change (07-08)	2008	2009	% Change (08-09)	2009	2010	% Change (09-10)	2010	2011	% Change (10-11)	% Mean Growth Rate (07-11)	5 Year Average Reg. Students
SHERIDAN	19	17	-11	17	24	41	24	30	25	30	21	-30	6	22
Total	***19***	***17***	***-11***	***17***	***24***	***41***	***24***	***30***	***25***	***30***	***21***	***-30***		

Labour Market

- **MODERATE**

Employment Ontario[2]

Information Systems Analysts and Consultants (NOC - 2171)

- Employment Ontario Rating (2009-2013):
  - **Good**
- Education and Training
  - "A bachelor's degree in computer science, computer systems engineering, software engineering, business administration or a related discipline, or the completion of a college program in computer science is required. Experience as a computer programmer may be required. Knowledge of industry/business matters and practices is an advantage."

[2] "2171 Information Systems Analysts and Consultants." *Employment Ontario*. N.p., n.d. Web. 6 Sept. 2012. <http://www.tcu.gov.on.ca/eng/labourmarket/ojf/pdf/2171_e.pdf>.

Key Research Findings

  - "While technical skills are crucial, employers are placing more emphasis on written and verbal communication skills, project management skills, leadership and management skills, presentation skills and appropriate business experience. Employers also emphasize the need for industry-specific skills and experience, with an increasing emphasis on ERP applications."

  - "The Ontario government supports programs that can help newcomers get their license or certificate in their profession or trade so that they can work in Ontario. For more information, visit the Ministry of Citizenship and Immigration website at http://www.citizenship.gov.on.ca/english/working/experience/"

- Demand
  - "Opportunities for employment in this occupation are expected to be good over the period from 2009 to 2013. Openings will be created both through expansion and replacement, as workers leave the labour force or move into managerial positions. In an economic downturn, employment in the high-tech sector can fall below the forecasted rate. However, companies across all sectors will continue to invest in information technologies, but at a more measured pace."

  - "As technology becomes more complex, employers will demand a more skilled and educated workforce. New graduates with combined degrees in information and communication technology (ICT) as well as in business studies will have the best employment opportunities. Employers are constantly seeking candidates with strong communication and project management skills with advanced degrees in computer science, computer engineering, information science or an MBA in information systems. Experience in business analysis is often a prerequisite. Consulting and freelance work are areas of growth within this occupation."

  - "According to a recent study by the Information and Communications Technology Council (ICTC), employers are most in need of workers needs with a combination of technical, business and interpersonal skills, including:"
    - "core technical skills;"
    - "experience with specific applications and platforms;"
    - "experience with specific business processes to which ICT is a solution;"
    - "communications skills; and"
    - "team work skills"

Key Research Findings

Employment Ontario [3]

Electronic Service Technicians (Household and Business Equipment) Consultants (NOC - 2242)

- Employment Ontario Rating (2009-2013):
  - **Average**
- Education and Training
  - "Completion of a two to three-year college program in electronics or completion of a four-year apprenticeship program in electronic servicing and repair or completion of high school or college courses in electronics and on-the-job training is required. Trade certification for electronic technician, consumer products, is voluntary in Ontario. Although the certificate is not mandatory, it indicates a certain level of achievement and is required by some employers. The Ontario Association of Certified Engineering Technicians and Technologists (OACETT) also certifies electronic service technicians. The certification process includes a period of supervised work experience, usually up to two years, and a professional practice examination. Inter-provincial (Red Seal) trade certification, which allows qualified Electronic Technicians (of consumer products) to work in other provinces and territories, is available for this trade. The new Agreement on Internal Trade will also make the movement of workers between provinces easier."
- Demand
  - "Opportunities for employment in this occupation are expected to be average over the period from 2009 to 2013. Technological advancements have lowered the price and improved the quality of home entertainment centres and other electronic products thereby reducing the demand for qualified technicians. However, in the future, growth might be spurred by the introduction of sophisticated digital equipment. As long as the price remains high, consumers will choose to repair rather than replace expensive electronic items. The proliferation of new electronic devices and rapidly changing technology means that additional demand will be generated more through warranty related repairs than through postwarranty repairs by consumers."

  - "Firms recruit new graduates from community colleges. They also utilize informal networks and newspaper advertisements as methods of seeking new employees. People working in these occupations should expect to undergo intermittent retraining and professional development to keep up with rapid technological changes. Opportunities will be best for those with knowledge of electronics and who have related hands-on experience and good customer service skills."

[3] "2242 Electronic Service Technicians (Household and Business Equipment) ." *Employment Ontario*. N.p., n.d. Web. 6 Sept. 2012. <http://www.tcu.gov.on.ca/eng/labourmarket/ojf/pdf/2242_e.pdf>.

Key Research Findings

Employment Ontario [4]

Computer and Network Operators and Web Technicians (NOC - 2281)

- Employment Ontario Rating (2009-2013):
  - **Average**
- Education and Training
  - "Completion of a college or other program in computer science, network administration, web technology or in a related field is usually required. Certification or training provided by software vendors may be required by some employers. Knowledge of industry/business matters and practices is an advantage."
  - "While technical skills are crucial, employers are placing more emphasis on strong problem solving, analytical, and communication skills because troubleshooting and helping others are key parts of the job."
- Demand
  - "Opportunities for employment in this occupation are expected to be average over the period from 2009 to 2013. Most medium and large workplaces have computer network and websites leading to a large number of potential employers. However, information technology is maturing and becoming more standardized allowing businesses to manage their networks and websites more efficiently. Although the demand for information technology will create new opportunities, the supply of new graduates should meet industry needs. Workers in this field are expected to perform a variety of functions not typically covered by a single work description."
  - "Experienced computer and network operators and web technicians, who keep up-to-date with new and changing technologies, will face the best prospects in securing employment in this field. Certification may be required by some employers. Co-op courses and internships can provide the industry and business knowledge and experience that employers want."
  - "According to a recent study by the Information and Communications Technology Council (ICTC), employers are most in need of workers needs with a combination of technical, business and interpersonal skills, including:"
    - "core technical skills;"
    - "experience with specific applications and platforms;"
    - "experience with specific business processes to which ICT is a solution;"
    - "communications skills; and"
    - "team work skills"

[4] "2281 Computer and Network Operators and Web Technicians ." *Employment Ontario*. N.p., n.d. Web. 6 Sept. 2012. <http://www.tcu.gov.on.ca/eng/labourmarket/ojf/pdf/2281_e.pdf>.

Key Research Findings

Employment Ontario [5]

User Support Technicians (NOC - 2282)

- Employment Ontario Rating (2009-2013):
  - **Good**
- Education and Training
  - "Completion of a college program in computer science, computer programming or network administration is usually required. College or other courses in computer programming or network administration are usually required. Certification or training provided by software vendors may be required by some employers. Knowledge of industry/business matters and practices is an advantage."
  - "While technical skills are crucial, employers are placing more emphasis on strong problem solving, analytical, and communication skills because troubleshooting and helping others are key parts of the job."
- Demand
  - "Opportunities for employment in this occupation are expected to be good over the period from 2009 to 2013. Due to global technological advancement, companies will continue to implement new technologies, maintaining the need for this occupation. Furthermore, complex technology often results in a growing need for user support. Although the demand for user support is expected to show above average growth through 2013, the provider of user support can often reside out of province, even out of country. Since many of these jobs could be outsourced to areas where prevailing wages are lower, demand for these workers will be moderated. User support is often an entry level position and is often the starting point for many new IT graduates."
  - "Candidates with strong problem solving, analytical, interpersonal and communication skills should have the best prospects."
  - "According to a recent study by the Information and Communications Technology Council (ICTC), employers are most in need of workers needs with a combination of technical, business and interpersonal skills, including:"
    - "core technical skills;"
    - "experience with specific applications and platforms;"
    - "experience with specific business processes to which ICT is a solution;"
    - "communications skills; and"
    - "team work skills"

[5] "2282 User Support Technicians ." *Employment Ontario*. N.p., n.d. Web. 6 Sept. 2012. <http://www.tcu.gov.on.ca/eng/labourmarket/ojf/pdf/2282_e.pdf>.

Key Research Findings

Employment Ontario [6]

Computer and Information Systems Managers (NOC-0213)

- Employment Ontario Rating (2009-2013):
  - **Good**
- Education and Training
  - "Managers require a combination of technical knowledge, education, and experience in systems analysis, database administration, software engineering, network design, or computer programming. A bachelor's or master's degree in computer science, engineering, business administration or commerce may be required. Certification, such as Microsoft Certified Systems Engineer (MCSE) or other designation, may be an asset. Knowledge of the specific industry is an asset."

  - "Managers also require a variety of non-technical skills, such as strong team leadership, good customer relations, good presentations and communications skills, problem-solving ability, and project management skills. Information technology managers and professionals must constantly learn and acquire new skills and knowledge of constantly changing and emerging technology."
- Demand
  - "Opportunities for employment in this occupation are expected to be good over the period from 2009 to 2013. Strong demand is due to the increasing use of technology in the workplace."

  - "Most advertised job positions require skills in e-commerce, network administration, programming languages, database software and computer security. In addition, employers look for individuals with communication and people skills. There are many employment agencies and executive search firms active in this sector. Due to the rapid pace of technological change in this area, managers will be expected to continuously upgrade their knowledge and skills, either through professional development programs or through graduate training. Individuals with strong communication skills and specialized technical knowledgeable will have the best employment prospects."

[6] "0213 Computer and Information Systems Managers." *Employment Ontario*. N.p., n.d. Web. 6 Sept. 2012. <http://www.tcu.gov.on.ca/eng/labourmarket/ojf/pdf/0213_e.pdf>.

Key Research Findings

HRSDC

	Computer and Information Systems Professionals (217)[7]		**Technical Occupations In Electronics And Electrical Engineering (224)[8]**		**Technical Occupations in Computer and Information Systems (228)[9]**		**Managers In Engineering, Architecture, Science And Information Systems (021)[10]**	
	Information Systems Analysts and Consultants (2171) Database Analysts and Data Administrators (2172) Software Engineers (2173) Computer Programmers and Interactive Media Developers (2174) Web Designers and Developers (2175)		Electrical and Electronics Engineering Technologists and Technicians (2241) Electronic Service Technicians (Household and Business Equipment) (2242) Industrial Instrument Technicians and Mechanics (2243) Aircraft Instrument, Electrical and Avionics Mechanics, Technicians and Inspectors (2244)		Computer and Network Operators and Web Technicians (2281) User Support Technicians (2282) Systems Testing Technicians (2283)		Engineering, Science and Architecture Managers (0210) Engineering Managers 0211) Architecture and Science Managers (0212) Information Systems and Data Processing Managers (0213)	
	Level	**Share**	**Level**	**Share**	**Level**	**Share**	**Level**	**Share**
Expansion Demand:	88,401	58%	16,476	35%	23,562	48%	16,533	42%
Retirements:	46,688	31%	24,882	53%	20,544	42%	18,499	47%
Other Replacement Demand:	8,950	6%	2,992	6%	2,487	5%	2,224	6%
Emigration:	8,797	6%	2,482	5%	2,788	6%	1,812	5%

[7] "Computer and Information Systems Professionals (217)." Canadian Occupational Projection System (COPS). N.p., n.d. Web. 6 Sept. 2012. <http://www23.hrsdc.gc.ca/occupationsummarydetail.jsp?&tid=37>.

[8] "Technical Occupations In Electronics And Electrical Engineering (224)." Canadian Occupational Projection System (COPS). N.p., n.d. Web. 6 Sept. 2012. <http://www23.hrsdc.gc.ca/occupationsummarydetail.jsp?&tid=41>.

[9] "Technical Occupations in Computer and Information Systems (228)." Canadian Occupational Projection System (COPS). N.p., n.d. Web. 6 Sept. 2012. <http://www23.hrsdc.gc.ca/occupationsummarydetail.jsp?&tid=45>.

[10] Managers In Engineering, Architecture, Science And Information Systems (021)." Canadian Occupational Projection System (COPS). N.p., n.d. Web. 6 Sept. 2012. <http://www23.hrsdc.gc.ca/occupationsummarydetail.jsp?&tid=5>.

Key Research Findings

Projected Job Openings:	152,836	100%	46,832	100%	49,381	100%	39,068	100%
	Level	**Share**	**Level**	**Share**	**Level**	**Share**	**Level**	**Share**
School Leavers:	132,748	63%	34,401	72%	47,162	77%	14,675	39%
Immigration:	45,671	22%	8,896	19%	13,163	22%	5,768	15%
Other	32,242	15%	4,175	9%	678	1%	16,957	45%
Projected Job Seekers:	210,662	100%	47,472	100%	61,004	100%	37,400	100%

Computer and Information Systems Professionals (217)

"Although labour supply and demand in this occupation were recently balanced, projections indicate that the number of job seekers will be greater than the job openings over the 2011-2020 period. Job openings will mainly result from expansion demand. The majority of workers in this occupation are young so the need to replace workers who are retiring will be very small compared to the average. Although employment growth in this occupation will not reach the level of the 1990s, it will be one of the strongest over the projection period. This is because computer technology is now an integral part of the economy, which in general is increasingly knowledge-based. However, changes in technology that facilitate remote communication will increase competition in this industry since they will make it possible for Canadian companies to outsource information and communications technologies and development services to lower-cost countries. Although labour demand will be high, the number of job seekers is expected to be even higher. In fact, the number of computer science school leavers will continue to be high since this field of study continues to be very popular with young people. Immigration will also be an important source of job seekers since computer-related jobs remain one of the most attractive high-skilled occupations for immigrants, given that skills and knowledge acquired abroad in this field are easily transferable to Canada. Therefore, in spite of very strong growth in employment, the low replacement needs and the increase in the number of computer science graduates and immigrants will mean a surplus of workers in this occupation."

Technical Occupations In Electronics And Electrical Engineering (224)

"Based on projections and considering that labour supply and demand in this occupation were balanced over the 2008-2010 period, it is expected that the number of job seekers in this occupation will remain sufficient to fill the job openings over the 2011-2020 period. The majority of job openings will arise from retirements, but expansion demand will also create a significant number of job openings. The increase in job openings will be average, which is a clear improvement over the job losses experienced over the 2001-2010 period. In fact, industries related to communications and information technologies (including electronics) will pick up again in the coming years. The return to growth in this sector comes after troubled years that followed after the tech bubble burst. With regard to labour supply, the majority of job seekers will come from the school system. The nature of the occupation is also such that many immigrants will find employment in it over the projection period."

Key Research Findings

Technical Occupations in Computer and Information Systems (228) "Based on projections and considering that labour supply and demand in this occupation were balanced, it is expected that the number of job seekers will continue to be sufficient to fill the job openings in this occupation over the 2011-2020 period. Job openings will result from both employment growth and retirements. In fact, growth from expansion demand will be higher than for other occupations over the projection period. However, expansion demand will be clearly weaker than it was over the 2001-2010 period. Despite the significant number of job openings that will arise from retirements, the retirement rate for this occupation will be lower than for other occupations. This is normal given that the workers are generally younger than they are in other occupations. With regard to labour supply, the majority of job seekers will come from the school system given the nature of the occupation. It should also be noted that a significant number of immigrants will work in this occupation."	**Managers In Engineering, Architecture, Science And Information Systems (021)** "Given that labour supply and demand in this occupation were balanced, projections indicate that the number of job seekers will be sufficient to fill the job openings over the 2011-2020 period. Job openings will arise from both employment growth and retirements. The retirement rate for this occupation will be similar to the rate for all occupations. Job openings resulting from economic growth will increase more than the average for all occupations because this occupation will benefit from the strength of investments in private and public infrastructure projects and the strong growth in computer systems design services. In terms of supply, nearly one half of job seekers will come from the school system. However, given that many years of experience are often needed to obtain a management position, a significant number of job seekers will come from other occupations, mainly engineers and computer scientists working in natural and applied sciences."

US Bureau of Labour[11]

Computer, ATM, and Office Machine Repairers (SOC – 49-2011)

- Employment Growth (2010/2020): **Increase 7%**
  - **146,200**(2010) to **155,800**(2020)

- "Computer repairers will see a continued demand for their services as computer parts need replacing or organizations need hardware upgrades. As companies modernize and use new technology in their day-to-day operations, computer repairers will continue to see employment opportunities."

- "Office and machine repairers will also continue to see demand for their services as office equipment continues to break down and need preventive maintenance."

[11] "Computer, ATM, and Office Machine Repairers ." *Occupational Outlook Handbook*. N.p., n.d. Web. 6 Sept. 2012. <http://www.bls.gov/ooh/installation-maintenance-and-repair/computer-atm-and-office-machine-repairers.htm#tab-6>.

Key Research Findings

- “However, increasing use of electronic banking is causing a decline in the demand for new ATMs, which may result in a decreased need for ATM repairers.”

- “Workers with experience, education from a trade school, and some certification often will have the best opportunities. Employers also prefer to hire workers whose military service has provided them with relevant training and experience. ATM repairers with training in the security of ATM networks have the best job prospects.”

Key Research Findings

US Bureau of Labour[12]

Network and Computer Systems Administrators (SOC – 15-1142)

- Employment Growth (2010/2020): **Increase 7%**
  - **347,200**(2010) to **443,800**(2020)

- "Employment of network and computer systems administrators is expected to grow 28 percent from 2010 to 2020, faster than the average for all occupations. Demand for these workers is high and should continue to grow as firms invest in newer, faster technology and mobile networks. In addition, information security concerns are increasing for many businesses as managers realize that their current security measures are not enough to combat growing threats. More administrators with proper training will be needed to reinforce network and system security."

- "Growth is expected in healthcare industries as their use of information technology increases. More administrators will be required to manage the growing systems and networks found at hospitals and other healthcare institutions."

- "Job opportunities should be favorable for this occupation. Prospects should be best for applicants who have a bachelor's degree in computer science and who are up to date on the latest technology."

US Bureau of Labour[13]

Electrical and Electronics Installers and Repairers

Occupational Title	SOC Code	Employment, 2010	Projected Employment, 2020	Change, 2010-20	
				Percent	Numeric
Electrical and Electronics Installers and Repairers	—	141,100	144,700	3	3,600
Electric Motor, Power Tool, and Related Repairers	49-2092	19,800	20,800	5	1,000
Electrical and Electronics Installers and Repairers, Transportation Equipment	49-2093	12,700	13,000	2	300
Electrical and Electronics Repairers, Commercial and Industrial Equipment	49-2094	69,100	69,900	1	800
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	49-2095	23,400	24,600	5	1,100
Electronic Equipment Installers and Repairers, Motor Vehicles	49-2096	16,000	16,400	3	400

- "Overall employment of electrical and electronics installers and repairers is expected to grow 3 percent from 2010 to 2020, slower than the average for all occupations."

[12] "Network and Computer Systems Administrators." *Occupational Outlook Handbook*. N.p., n.d. Web. 6 Sept. 2012. <http://www.bls.gov/ooh/computer-and-information-technology/network-and-computer-systems-administrators.htm#tab-6>.

[13] "Electrical and Electronics Installers and Repairers ." *Occupational Outlook Handbook*. N.p., n.d. Web. 6 Sept. 2012. <http://www.bls.gov/ooh/installation-maintenance-and-repair/electrical-and-electronics-installers-and-repairers.htm#tab-6>.

Key Research Findings

- "Projected employment change for specific groups of workers within this occupation is as follows:"
    - "Electrical and electronics installers and repairers of commercial and industrial equipment: little or no change. As competition increases, businesses strive to lower costs by increasing and improving automation. This equipment needs service and repair, and generally increases the demand for electrical workers, but improved reliability of equipment is expected to temper employment growth."
    - "Motor vehicle electronic equipment installers and repairers: 3 percent growth. As motor vehicle manufacturers install more and better sound, security, entertainment, and navigation systems in new vehicles, and as newer electronic systems require progressively less maintenance, employment growth for aftermarket electronic equipment installers will be limited."
    - "Electric motor, power tool, and related repairers: 5 percent growth. Retrofitting electrical generators in public buildings to reduce emissions and energy consumption will spur some employment growth. However, improvements in electrical and electronic equipment design, as well as the increased use of disposable tool parts, should limit employment growth."
    - "Electrical and electronic installers and repairers of transportation equipment: little or no change. Declining employment in the rail transportation industry will dampen growth in this occupational specialty even as other transportation systems need additional workers."
    - "Powerhouse, substation, and relay electrical and electronics installers and repairers: 5 percent growth. Although privatization in utilities industries should improve productivity and hinder employment growth, the installation of newer, energy-efficient green technologies will spur some demand for employment."
- "Overall job opportunities should be best for applicants who have an associate's degree in electronics, certification, or related experience. In addition to employment growth, the need to replace workers who transfer to other occupations or leave the labor force will result in some job openings."

Sector Councils and Reports

Canadian Technology Accreditation Board
http://www.cctt.ca/landing_4.asp

Ontario Association of Certified Engineering Technicians & Technologists
http://www.oacett.org/

Information and Communications Technology Council
http://www.ictc-ctic.ca/

Key Research Findings

Employment Profile[14]

In 2010-2011, **30%** of graduates in the Computer Engineering Technician program and **52.9%** of the Computer Engineering Technology program were employed in a full time position which related to this program of study provincially

Electronics

Total Graduates:	3,237	Total Graduates in Survey:	2,379	Response Rate: ☛	73.6%

☛ 594 graduates were reported after the survey window had closed. While program information for these graduates has been included wherever possible, these graduates are not included in survey results, such as response rates.

Programs in Electronics

Programs	Duration	Total Grads	Total in Survey	Total in Labour Force	Colleges
Computer Engineering Technician	2 Years	51	40	30	Boréal, Centennial, Niagara, Northern, Sault, Sheridan, Sir Sandford Fleming
Computer Engineering Technology	3 Years	128	104	88	Algonquin, Boréal, Centennial, Conestoga, Humber, La Cité, Mohawk, Niagara, Sault, Seneca, Sheridan, Sir Sandford Fleming
Computer Foundations	1 Year	3	2	2	Sault
Computer Repair And Maintenance	1 Year	23	18	12	Centennial
Computer Systems Technician	2 Years	391	276	228	Algonquin, Canadore, Centennial, Durham, Fanshawe, George Brown, Georgian, La Cité, Mohawk, Sheridan, St. Clair
Computer Systems Technology	3 Years	337	262	230	Algonquin, Cambrian, Canadore, Centennial, Durham, Fanshawe, George Brown, La Cité, Mohawk, Seneca, Sheridan, St. Clair
Electrical Engineering Technician	2 Years	588	430	296	Algonquin, Boréal, Cambrian, Conestoga, Durham, Fanshawe, Humber, La Cité, Loyalist, Mohawk, Niagara, Northern, Sault, Sir Sandford Fleming, St. Lawrence
Electrical Engineering Technology	3 Years	319	220	188	Algonquin, Boréal, Cambrian, Conestoga, Fanshawe, Georgian, Humber, Mohawk, Niagara, Northern, Sault
Electrical Techniques	1 Year	544	398	222	Boréal, Cambrian, Canadore, Fanshawe, La Cité, Lambton, Loyalist, Sheridan, Sir Sandford Fleming, St. Clair
Electronics Engineering Technician	2 Years	278	203	165	Algonquin, Centennial, Conestoga, Confederation, Durham, Fanshawe, Humber, La Cité, Mohawk, Niagara, Seneca, Sheridan
Electronics Engineering Technology	3 Years	157	114	93	Algonquin, Boréal, Centennial, Conestoga, Durham, Fanshawe, Humber, La Cité, Mohawk, Niagara, Seneca, Sheridan, St. Clair
Electronics Engineering Technology – Communications	3 Years	12	10	9	Humber
Enterprise Database Management	Post Diploma	34	29	29	Seneca, Sheridan
Entertainment Technology	3 Years	9	8	8	St. Clair
Game Programming	3 Years	10	10	9	Humber
Informatics And Security – Bachelor Of Applied Technology	4 Years	9	7	7	Seneca

228 Employment Profile: 2009–2010 Graduates

[14] "Employment Profile." *Ontario*. N.p., 2011. Web. 19 July 2012. <http://www.tcu.gov.on.ca/pepg/audiences/colleges/serials/eprofile09-10/profile10.pdf>.

Key Research Findings

Programs in Electronics (cont.)

Programs	Duration	Total Grads	Total in Survey	Total in Labour Force	Colleges
Information Systems Security – Bachelor Of Applied Information Sciences	4 Years	9	6	6	Sheridan
Integrated Telecommunication And Computer Technologies – Bachelor Of Applied Technology	4 Years	9	7	7	Conestoga
Local Area Network Design And Administration	Post Diploma	5	3	3	Seneca
Powerline Technician	2 Years	43	30	29	Cambrian
Process Automation – Bachelor Of Applied Technology	4 Years	1	1	1	Mohawk
Software Engineering Technician	2 Years	17	14	12	Centennial, Conestoga
Software Engineering Technology	3 Years	21	16	15	Centennial, Conestoga
Software Systems – Design, Development And Management – Bachelor Of Applied Information Sciences	4 Years	7	7	7	Centennial
Telecommunications Technology	3 Years	19	16	16	Sheridan
Wireless Telecommunications	Post Diploma	205	144	121	George Brown, Humber, Seneca
Wireless/Mobility Telecommunications Engineering Technician	2 Years	8	4	–	Algonquin

Summary of Survey Data

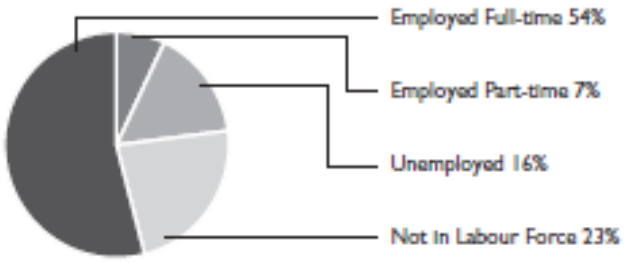
	Program Cluster	All Programs
Survey Population	2,379	50,622
Labour Force Participation	77%	74%
Employment Rate[a]	**80%**	**83%**
Employed Part-time[a]	9%	18%
Employed Full-time[a]	70%	65%
Average Annual Earnings – Total	**$36,651**	**$33,199**
Average Annual Earnings – Female	$35,543	$31,897
Average Annual Earnings – Male	$36,733	$34,607
Graduate Satisfaction	73%	79%
Employer Satisfaction	94%	93%

a. As a percentage of graduates in the labour force.

Key Research Findings

Electronics

Graduate Outcomes for Program Cluster (as a percentage of all respondents)



Top Five Industries of Employment

	#	%
Professional, Scientific and Technical Services	164	11.6%
Specialty Trade Contractors	136	9.7%
Computer and Electronic Product Manufacturing	92	6.5%
Utilities	74	5.3%
Telecommunications	64	4.5%

Top Five Occupational Categories

	#	%
User Support Technicians	104	7.3%
Electrical and Electronics Engineering Technologists and Technicians	94	6.6%
Computer Network Technicians	72	5.1%
Electronic Service Technicians (Household and Business Equipment)	71	5.0%
Retail Salespersons and Sales Clerks	71	5.0%

Key Research Findings

Electronics

Summary of Graduate Outcomes by Program

	Full-time Employed, Program Related		Full-time Employed, Program Unrelated		Part-time Employed, Program Related		Part-time Employed, Program Unrelated		Unemployed		Not in Labour Force	
	#	%	#	%	#	%	#	%	#	%	#	%
Computer Engineering Technician	12	30.0	6	15.0	2	5.0	2	5.0	8	20.0	10	25.0
Computer Engineering Technology	55	52.9	10	9.6	1	1.0	4	3.8	18	17.3	16	15.4
Computer Repair And Maintenance	2	11.1	3	16.7	2	11.1	1	5.6	4	22.2	6	33.3
Computer Systems Technician	107	38.8	45	16.3	7	2.5	14	5.1	55	19.9	48	17.4
Computer Systems Technology	129	49.2	28	10.7	10	3.8	17	6.5	46	17.6	32	12.2
Electrical Engineering Technician	117	27.2	100	23.3	3	0.7	23	5.3	53	12.3	134	31.2
Electrical Engineering Technology	106	48.2	34	15.5	3	1.4	7	3.2	38	17.3	32	14.5
Electrical Techniques	68	17.1	85	21.4	2	0.5	24	6.0	43	10.8	176	44.2
Electronics Engineering Technician	68	33.5	49	24.1	2	1.0	8	3.9	38	18.7	38	18.7
Electronics Engineering Technology	63	55.3	12	10.5	2	1.8	5	4.4	11	9.6	21	18.4
Electronics Engineering Technology – Communications	3	30.0	1	10.0	–	–	1	10.0	4	40.0	1	10.0
Enterprise Database Management	18	62.1	3	10.3	1	3.4	1	3.4	6	20.7	–	–
Entertainment Technology	–	–	2	25.0	2	25.0	2	25.0	2	25.0	–	–
Game Programming	3	30.0	2	20.0	–	–	2	20.0	2	20.0	1	10.0
Informatics And Security – Bachelor Of Applied Technology	2	28.6	3	42.9	–	–	1	14.3	1	14.3	–	–
Information Systems Security – Bachelor Of Applied Information Sciences	3	50.0	2	33.3	–	–	–	–	1	16.7	–	–
Integrated Telecommunication And Computer Technologies – Bachelor Of Applied Technology	5	71.4	1	14.3	–	–	–	–	1	14.3	–	–
Powerline Technician	22	73.3	2	6.7	–	–	1	3.3	4	13.3	1	3.3
Software Engineering Technician	8	57.1	–	–	–	–	2	14.3	2	14.3	2	14.3
Software Engineering Technology	10	62.5	–	–	–	–	3	18.8	2	12.5	1	6.3
Software Systems – Design, Development And Management – Bachelor Of Applied Information Sciences	3	42.9	–	–	1	14.3	–	–	3	42.9	–	–
Telecommunications Technology	12	75.0	1	6.3	–	–	–	–	3	18.8	–	–
Wireless Telecommunications	42	29.2	35	24.3	6	4.2	8	5.6	30	20.8	23	16.0
All Programs in Cluster*	**858**	**36.2**	**424**	**17.9**	**44**	**1.9**	**126**	**5.3**	**375**	**15.8**	**542**	**22.9**

* Does not include 4 programs with fewer than 5 graduates in the labour force.

Key Research Findings

Electronics

Earnings of Full-time Employed Participants

Program	Average – Females	Average – Males	Median – Females	Median – Males	Average for Program	Median for Program
Computer Engineering Technician	–	$34,255	–	$32,100	$32,936	$29,200
Computer Engineering Technology	$41,144	$35,476	$37,164	$34,500	$36,315	$34,500
Computer Repair And Maintenance	–	$33,273	–	$30,000	$33,273	$30,000
Computer Systems Technician	–	$36,325	–	$35,000	$35,927	$34,838
Computer Systems Technology	$36,036	$39,776	$36,076	$40,000	$39,520	$39,866
Electrical Engineering Technician	–	$34,429	–	$31,703	$34,369	$31,494
Electrical Engineering Technology	$32,278	$41,334	$30,000	$40,000	$40,712	$40,000
Electrical Techniques	–	$30,193	–	$28,000	$30,063	$27,532
Electronics Engineering Technician	$40,822	$36,071	$34,000	$36,000	$36,340	$36,000
Electronics Engineering Technology	$39,021	$38,165	$39,554	$35,457	$38,294	$36,250
Electronics Engineering Technology – Communications	–	–	–	–	–	–
Enterprise Database Management	$48,098	$42,170	$48,884	$40,000	$44,763	$43,800
Entertainment Technology	–	–	–	–	–	–
Game Programming	–	–	–	–	–	–
Informatics And Security – Bachelor Of Applied Technology	–	–	–	–	–	–
Information Systems Security – Bachelor Of Applied Information Sciences	–	–	–	–	–	–
Integrated Telecommunication And Computer Technologies – Bachelor Of Applied Technology	–	–	–	–	–	–
Powerline Technician	–	$40,853	–	$39,687	$40,853	$39,687
Software Engineering Technician	–	$43,903	–	$43,193	$43,903	$43,193
Software Engineering Technology	–	$54,420	–	$57,679	$56,036	$58,000
Software Systems – Design, Development And Management – Bachelor Of Applied Information Sciences	–	–	–	–	–	–
Telecommunications Technology	–	$53,586	–	$52,550	$52,351	$51,100
Wireless Telecommunications	$27,093	$32,133	$23,725	$31,286	$31,080	$25,029
All Programs in Cluster*	**$35,543**	**$36,681**	**$35,000**	**$35,197**	**$36,602**	**$35,000**

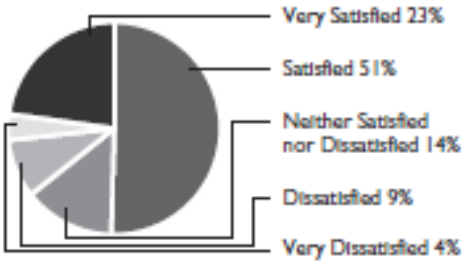
* Does not include 4 programs with fewer than 5 graduates in the labour force.

Key Research Findings

Electronics

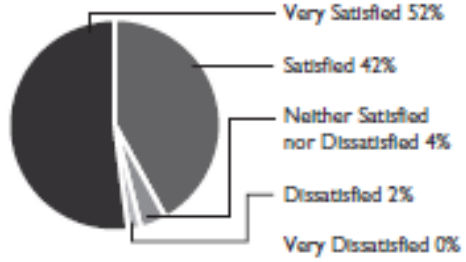
Program Cluster Satisfaction

Graduate Satisfaction with the usefulness of his/her college education in achieving his/her goals after graduation:*



* 2,239 graduates participated in this question.

Employer Satisfaction with employee overall college preparation for the type of work he/she was doing:*



* 278 employers participated in this survey.

Program Cluster Historical Data

	00-01 Grads	01-02 Grads	02-03 Grads	03-04 Grads	04-05 Grads	05-06 Grads	06-07 Grads	07-08 Grads	08-09 Grads	09-10 Grads
Percentage Employed	82.6%	80.5%	79.2%	82.6%	86.4%	87.3%	87.8%	86.2%	81.5%	79.5%
Percentage Employed Full-time	77.2%	73.2%	72.5%	74.1%	79.0%	81.8%	80.8%	80.8%	72.3%	70.3%
Percentage Employed Full-time Related Jobs	61.4%	50.1%	48.1%	49.3%	57.9%	61.2%	63.0%	65.0%	50.9%	47.1%
Average Annual Salary Full-time Related Jobs	$35,105	$33,856	$34,047	$35,007	$35,129	$35,714	$37,856	$39,287	$39,918	$39,829

Key Research Findings

Working in Canada

Information Systems Analysts and Consultants (NOC 2171)[15]				
	Employment Potential	Wage ($/hr)		
		Low	Median	High
Ontario	N/A	19.59	36.06	52.75
Hamilton--Niagara Peninsula Region	N/A	20.00	30.77	52.88
Kingston - Pembroke Region	N/A	N/A	N/A	N/A
Kitchener--Waterloo--Barrie Region	Fair	19.23	33.33	48.08
London Region	N/A	N/A	N/A	N/A
Muskoka-Kawarthas Region	N/A	N/A	N/A	N/A
Northeast Region	N/A	N/A	N/A	N/A
Northwest Region	N/A	N/A	N/A	N/A
Ottawa Region	Fair	23.08	37.95	52.88
Stratford--Bruce Peninsula Region	N/A	N/A	N/A	N/A
Toronto Region	Fair	N/A	N/A	N/A
Windsor-Sarnia Region	N/A	N/A	N/A	N/A

Electronic Service Technicians (Household and Business Equipment) (NOC 2242)[16]				
	Employment Potential	Wage ($/hr)		
		Low	Median	High
Ontario	N/A	12.50	22.00	39.00
Hamilton--Niagara Peninsula Region	N/A	13.00	20.33	36.54
Kingston - Pembroke Region	N/A	12.50	22.00	39.00
Kitchener--Waterloo--Barrie Region	N/A	13.75	20.50	43.00
London Region	N/A	12.50	22.00	39.00
Muskoka-Kawarthas Region	N/A	12.50	22.00	39.00
Northeast Region	N/A	12.50	22.00	39.00
Northwest Region	N/A	12.50	22.00	39.00
Ottawa Region	N/A	13.00	21.63	38.00
Stratford--Bruce Peninsula Region	N/A	10.25	16.00	37.84
Toronto Region	N/A	N/A	N/A	N/A
Windsor-Sarnia Region	N/A	N/A	N/A	N/A

[15] "Information Systems Analysts and Consultants (NOC 2171)." *Working In Canada*. N.p., n.d. Web. 6 Sept. 2012. <http://www.workingincanada.gc.ca/report-eng.do?lang=eng&noc=2171&area=8792&titleKeyword=systems+auditor®ionKeyword=Peterborough,+Ontario&source=2&action=final>.

[16] "Electronic Service Technicians (Household and Business Equipment) (NOC 2242)." *Working In Canada*. N.p., n.d. Web. 6 Sept. 2012. <http://www.workingincanada.gc.ca/report-eng.do?lang=eng&noc=2242&area=8792&titleKeyword=computer+service+technician®ionKeyword=Peterborough,+Ontario&source=2&action=final>.

Key Research Findings

Computer Network Technicians (NOC 2281) [17]				
	Employment Potential	Wage ($/hr)		
		Low	Median	High
Ontario	N/A	14.00	27.69	46.15
Hamilton--Niagara Peninsula Region	N/A	15.00	28.21	42.31
Kingston - Pembroke Region	N/A	14.00	27.69	46.15
Kitchener--Waterloo--Barrie Region	N/A	16.00	26.54	47.12
London Region	N/A	14.00	27.69	46.15
Muskoka-Kawarthas Region	N/A	14.00	27.69	46.15
Northeast Region	N/A	14.00	27.69	46.15
Northwest Region	N/A	14.00	27.69	46.15
Ottawa Region	Fair	N/A	N/A	N/A
Stratford--Bruce Peninsula Region	N/A	14.00	27.69	46.15
Toronto Region	Fair	12.69	25.38	50.48
Windsor-Sarnia Region	N/A	14.00	27.69	46.15

User Support Technicians (NOC 2282)[18]				
	Employment Potential	Wage ($/hr)		
		Low	Median	High
Ontario	N/A	12.00	23.56	39.34
Hamilton--Niagara Peninsula Region	N/A	12.00	20.00	38.46
Kingston - Pembroke Region	N/A	12.00	23.56	39.34
Kitchener--Waterloo--Barrie Region	N/A	11.50	23.08	43.27
London Region	N/A	N/A	N/A	N/A
Muskoka-Kawarthas Region	N/A	12.00	23.56	39.34
Northeast Region	N/A	12.00	23.56	39.34
Northwest Region	N/A	12.00	23.56	39.34
Ottawa Region	Limited	N/A	N/A	N/A
Stratford--Bruce Peninsula Region	N/A	12.00	23.56	39.34
Toronto Region	Limited	16.25	24.04	38.46
Windsor-Sarnia Region	N/A	12.00	23.56	39.34

[17] "Computer Network Technicians (NOC 2281)." *Working In Canada*. N.p., n.d. Web. 6 Sept. 2012. <http://www.workingincanada.gc.ca/report-eng.do?area=8792&lang=eng&noc=2281&action=final&ln=p®ionKeyword=Peterborough%2C+Ontario&s=2&source=2&titleKeyword=network+administrator#outlook>.

[18] "User Support Technicians (NOC 2282)." *Working In Canada*. N.p., n.d. Web. 6 Sept. 2012. <http://www.workingincanada.gc.ca/report-eng.do?area=8792&lang=eng&noc=2282&action=final&ln=p®ionKeyword=Peterborough%2C+Ontario&s=2&source=2&titleKeyword=user+support+technician#outlook>.

Key Research Findings

Computer and Information Systems Managers (NOC 0213)[19]				
	Employment Potential	Wage ($/hr)		
		Low	Median	High
Ontario	N/A	22.60	40.00	58.65
Hamilton--Niagara Peninsula Region	N/A	22.60	40.00	58.65
Kingston - Pembroke Region	N/A	22.60	40.00	58.65
Kitchener--Waterloo--Barrie Region	Good	23.08	39.66	62.98
London Region	N/A	22.60	40.00	58.65
Muskoka-Kawarthas Region	N/A	22.60	40.00	58.65
Northeast Region	N/A	22.60	40.00	58.65
Northwest Region	N/A	22.60	40.00	58.65
Ottawa Region	Good	23.50	43.59	58.46
Stratford--Bruce Peninsula Region	N/A	22.60	40.00	58.65
Toronto Region	Good	22.60	40.00	58.65
Windsor-Sarnia Region	N/A	22.60	40.00	58.65

Competitive Analysis[20] • MODERATE

The following information consists of OCAS yearly fall application and registration data as well as a conversion ratio for each program under this category:

Certificate

- Centennial had a **4:1** conversion ratio in 2011

Diploma

- Fleming's ratio was to the system's **(5:1)** in 2011
- Sheridan, the only direct competitor, had a low ratio **(9:1)** in 2011
- Overall, Boreal had the highest ratio in 2011 **(2:1)** and Centennial had the lowest **(21:1)**

[19] "Information Systems Analysts and Consultants (NOC 2171)." *Working In Canada*. N.p., n.d. Web. 6 Sept. 2012. <http://www.workingincanada.gc.ca/report-eng.do?lang=eng&noc=2171&area=8792&titleKeyword=systems+auditor®ionKeyword=Peterborough,+Ontario&source=2&action=final>.

[20] Application data obtained from OCAS College Count Cube October 19, 2011Registration data obtained from the Program Counts by Applicant Type Report (RPT0050P) in the OCAS Reporting and Analytics Cube December 7, 2011.Some programs/colleges may not be included because they were missing MCU codes in the OCAS dataset Prepared by Fleming Data Research (07-2012)

Key Research Findings

Advanced Diploma

- Fleming's ratio was to the system's **(4:1)** in 2011
- Sheridan had a **4:1** ratio and Seneca had a slightly lower ratio **(5:1)** in 2011
- Overall, La Cite had the highest ratio in 2011 **(2:1)** and Centennial had the lowest **(8:1)**

Degree

- Sheridan had a relatively low conversion ratio in 2011 **(6:1)**

Certificate

Program: 40509 - COMPUTER REPAIR AND MAINTENANCE														
	App. 2007	Reg. 2007	Conversion Ratio	App. 2008	Reg. 2008	Conversion Ratio	App. 2009	Reg. 2009	Conversion Ratio	App. 2010	Reg. 2010	Conversion Ratio	App. 2011	Reg. 2011	Conversion Ratio
CENTENNIAL	89	21	4:1	79	14	6:1	81	10	8:1	93	13	7:1	86	23	4:1
Total	***89***	***21***	***4:1***	***79***	***14***	***6:1***	***81***	***10***	***8:1***	***93***	***13***	***7:1***	***86***	***23***	***4:1***

Diploma

Program: 50509 - COMPUTER ENGINEERING TECHNICIAN														
	App. 2007	Reg. 2007	Conversion Ratio	App. 2008	Reg. 2008	Conversion Ratio	App. 2009	Reg. 2009	Conversion Ratio	App. 2010	Reg. 2010	Conversion Ratio	App. 2011	Reg. 2011	Conversion Ratio
CENTENNIAL	55	10	6:1	58	5	12:1	81	8	10:1	93	8	12:1	62	3	21:1
COLLÈGE BORÉAL	0			20	7	3:1	34	16	2:1	38	23	2:1	39	18	2:1
FLEMING	65	21	3:1	66	13	5:1	109	27	4:1	92	26	4:1	73	16	5:1
NIAGARA	186	46	4:1	179	48	4:1	98	20	5:1	89	20	4:1	74	19	4:1
NORTHERN	0			0			42	26	2:1	38	11	3:1	33	12	3:1
SAULT	34	12	3:1	41	19	2:1	38	13	3:1	30	9	3:1	15		
→ SHERIDAN	96	9	11:1	112	11	10:1	146	18	8:1	132	17	8:1	135	15	9:1
ST. LAWRENCE	46	13	4:1	0			0			0			0		
Total	***482***	***111***	***4:1***	***476***	***103***	***5:1***	***548***	***128***	***4:1***	***512***	***114***	***4:1***	***431***	***83***	***5:1***

Key Research Findings

Advanced Diploma

Program: 60509 - COMPUTER ENGINEERING TECHNOLOGY															
	App. 2007	Reg. 2007	Conversion Ratio	App. 2008	Reg. 2008	Conversion Ratio	App. 2009	Reg. 2009	Conversion Ratio	App. 2010	Reg. 2010	Conversion Ratio	App. 2011	Reg. 2011	Conversion Ratio
ALGONQUIN	308	63	5:1	292	100	3:1	290	103	3:1	312	104	3:1	318	109	3:1
CENTENNIAL	149	18	8:1	169	18	9:1	145	17	9:1	156	11	14:1	126	16	8:1
CONESTOGA	141	21	7:1	217	37	6:1	217	46	5:1	217	52	4:1	204	42	5:1
FLEMING	80	18	4:1	83	24	3:1	92	18	5:1	77	18	4:1	84	23	4:1
HUMBER	291	34	9:1	343	46	7:1	352	51	7:1	352	50	7:1	425	61	7:1
LA CITÉ COLLÉGIAL	72	13	6:1	58	19	3:1	62	15	4:1	62	26	2:1	72	29	2:1
MOHAWK	228	45	5:1	248	61	4:1	221	66	3:1	237	65	4:1	224	51	4:1
NIAGARA	210	80	3:1	198	51	4:1	0			0			0		
NORTHERN	30	8	4:1	33	11	3:1	11			0			0		
SENECA	311	80	4:1	323	73	4:1	369	88	4:1	343	93	4:1	363	69	5:1
SHERIDAN	193	34	6:1	201	49	4:1	215	46	5:1	233	48	5:1	252	62	4:1
ST. LAWRENCE	36			0			0			0			0		
Total	***2049***	***414***	***5:1***	***2165***	***489***	***4:1***	***1974***	***450***	***4:1***	***1989***	***467***	***4:1***	***2068***	***462***	***4:1***

Degree

Program: 80509 - BACH OF APPLIED INFORMATION SCIENCES (INFORMATION SYSTEMS SECURITY)															
	App. 2007	Reg. 2007	Conversion Ratio	App. 2008	Reg. 2008	Conversion Ratio	App. 2009	Reg. 2009	Conversion Ratio	App. 2010	Reg. 2010	Conversion Ratio	App. 2011	Reg. 2011	Conversion Ratio
SHERIDAN	101	19	5:1	100	17	6:1	122	24	5:1	110	30	4:1	123	21	6:1
Total	***101***	***19***	***5:1***	***100***	***17***	***6:1***	***122***	***24***	***5:1***	***110***	***30***	***4:1***	***123***	***21***	***6:1***

Financial Analysis	• **WEAK** / • **MODERATE**

Source: Program Costing Analysis 2010/2011

Computer Engineering Technician	Contribution to Overhead: 25.6% Program Weight: 1.30 Funding Unit: 2.40
Computer Engineering Technology	Contribution to Overhead: 30.5% Program Weight: 1.30 Funding Unit: 3.40

Key Research Findings

Key Performance Indicators	• MODERATE / • MODERATE

Source: Key Performance Indicator Summary 5 Year Historical Overview KPI Data from Reporting Years 2008-2012

Computer Engineering Technician		
Key Performance Indicators	KPI1-Graduation Rate	+12% above system
	KPI2-Working	+10% above system
	KPI3-Working Related	+3% above system
	KPI4-Grad. Satisfaction	Even with system
	KPI8-Student Satisfaction-Learning	-9% below system
	KPI9-Student Satisfaction- Teachers	-15% below system
	KPI11-Grad. Satisfaction-Program	-8% below system
Computer Engineering Technology		
Key Performance Indicators	KPI1-Graduation Rate	+18% above system
	KPI2-Working	+5% above system
	KPI3-Working Related	+7% above system
	KPI4-Grad. Satisfaction	-3% below system
	KPI8-Student Satisfaction-Learning	Even with system
	KPI9-Student Satisfaction- Teachers	+1% above system
	KPI11-Grad. Satisfaction-Program	-6% below system

Resource Analysis

Equipment

Staffing

Space

Key Research Findings

Appendix

The following is the original environmental scan conducted by the Library Researchers to form the basis of the previous summary of Key Research Findings Report.

Overview of the Profession:

NOC 2171	**Computer Systems Analyst**
NOC 2242	**Computer Service Technician**
	Audio-Video service technician
	Audio-Video Repair Technician
NOC 2281	**Computer Network Technician**
NOC 2282	**Computer Help Desk Representative - systems**
NOC 0213	**Computer Networks Manager**

NOC 2171 – Information Systems Analysts and Consultants
(***Computer Systems Analyst)***

http://www.workingincanada.gc.ca/report-eng.do?lang=eng&noc=2171&area=8792&titleKeyword=computer+systems+analyst&regionKeyword=Peterborough,+Ontario&source=0&action=final

Description

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. They are employed in information technology consulting firms and in information technology units throughout the private and public sectors, or they may be self-employed.

Job Duties

The following is a summary of the main duties for some occupations in this unit group:

- Information systems business analysts and consultants confer with clients to identify and document requirements, conduct business and technical studies, design, develop, integrate and implement information systems business solutions, and provide advice on information systems strategy, policy, management, security and service delivery.
- Systems security analysts confer with clients to identify and document requirements, assess physical and technical security risks to data, software and hardware, and develop policies, procedures and contingency plans to minimize the effects of security breaches.
- Information systems quality assurance analysts develop and implement policies and procedures throughout the software development life cycle to maximize the efficiency, effectiveness and overall quality of software products and information systems.
- Systems auditors conduct independent third-party reviews to assess quality assurance practices, software products and information systems.

Included Job Titles

- IT (information technology) consultant, computer consultant, computer systems analyst, informatics consultant, informatics security analyst, information systems business analyst,

Key Research Findings

information systems quality assurance analyst, management information systems (MIS) analyst, systems auditor, systems consultant, systems security analyst.

NOC 2242 Electronic Service Technicians (Household and Business Equipment

Computer Service Technician
Audio-Video service technician
Audio-Video Repair Technician

http://www.workingincanada.gc.ca/report-eng.do?lang=eng&noc=2242&area=8792&titleKeyword=audio-video+service+technician&regionKeyword=Peterborough,+Ontario&source=0&action=final

Description

Electronic service technicians service and repair household and business electronic equipment such as audio and video systems, computers and peripherals, office equipment and other consumer electronic equipment and assemblies. They are employed by electronic service and retail establishments, by wholesale distributors and within service departments of electronic manufacturing companies.

Job Duties

Electronic service technicians perform some or all of the following duties:

- Install, maintain and repair household and business electronic equipment, such as televisions, radios, video cassette recorders, stereo equipment, photocopiers, computers and peripherals
- Inspect and test electronic equipment, components and assemblies using multimeters, circuit testers, oscilloscopes, logic probes and other electronic test instruments, tools and equipment
- Diagnose and locate circuit, component and equipment faults
- Adjust, align, replace or repair electronic equipment, assemblies and components following equipment manuals and schematics, and using soldering tools and other hand and power tools
- Complete work orders, test and maintenance reports
- May supervise other electronic equipment service technicians.

Included Job Titles

- alarm system technician, audio-video service technician, computer service technician, electronic service technician apprentice, electronic service technician supervisor, field service technician, electronic products, office equipment service technician, photocopy machine technician, radio and television service technician, satellite antenna servicer.
- **Common Job Titles**
- Alarm System Technician
- Computer Service Technician
- Office Equipment Service Technician
- Field Service Technician - Electronic Products
- Television Service Technician
- Audio-video Service Technician
- **Typical Employers**
- electronic equipment manufacturers
- business services firms
- computer service firms

Key Research Findings

- business machine manufacturers
- electrical and electronic machinery and equipment wholesalers
- machinery and equipment wholesalers
- appliance, television, radio and stereo stores
- machinery and equipment rental and leasing firms

http://www.tcu.gov.on.ca/eng/labourmarket/ojf/pdf/2242_e.pdf

NOC 2281 Computer Network Technicians

http://www.workingincanada.gc.ca/report-eng.do?lang=eng&noc=2281&area=8792&titleKeyword=computer+network+technician&regionKeyword=Peterborough,+Ontario&source=1&action=final

Description

Computer network technicians establish, operate, maintain, and co-ordinate the use of local and wide area networks (LANs and WANs), mainframe networks, hardware, software and related computer equipment. They set up and maintain Internet and Intranet Web sites and Web-server hardware and software, and monitor and optimize network connectivity and performance. They are employed in information technology units throughout the private and public sectors. Supervisors of computer network technicians are included in this group.

Job Duties

Computer network technicians perform some or all of the following duties:

- Maintain, troubleshoot and administer the use of local area networks (LANs), wide area networks (WANs), mainframe networks, computer workstations, connections to the Internet and peripheral equipment
- Evaluate and install computer hardware, networking software, operating system software and software applications
- Operate master consoles to monitor the performance of computer systems and networks and to co-ordinate access and use of computer networks
- Provide problem-solving services to network users
- Install, maintain, troubleshoot and upgrade Web-server hardware and software
- Implement network traffic and security monitoring software, and optimize server performance
- Perform routine network start up and close down and maintain control records
- Perform data backups and disaster recovery operations
- Conduct tests and perform security and quality controls
- Control and monitor e-mail use, Web navigation, and installed softwares
- Perform shell scripting or other basic scripting tasks
- May supervise other workers in this group.

Included Job Titles

- Internet Web site technician, LAN (local area network) administrator, LAN (local area network) technician, Web technician, computer network technician, computer network technician supervisor, data centre operator, network administrator, network support technician, supervisor, computer network technician, system administrator.

Key Research Findings

From Employment Ontario

Common Job Titles

- Computer Operator
- Computer Tape Librarian
- Data Centre Operator
- Internet Web Site Technician
- LAN (Local Area Network) Administrator
- LAN (Local Area Network) Technician
- Network Administrator
- Network Operator
- Network Support Technician
- Computer Operators Supervisor
- System Administrator
- Web Technician

Typical Employers

- computer systems design and related services
- information services
- finance and insurance
- public administration
- wholesale trade
- educational services
- large corporations and establishments

http://www.tcu.gov.on.ca/eng/labourmarket/ojf/pdf/2281_e.pdf

NOC 2282 - User Support Technicians
(Computer Help Desk Representative – systems)

http://www.workingincanada.gc.ca/report-eng.do?lang=eng&noc=2282&area=8792&titleKeyword=computer+help+desk+representative+-+systems&regionKeyword=Peterborough,+Ontario&source=0&action=final

Description

Technicians in this group provide first-line technical support to computer users experiencing difficulties with computer hardware and with computer applications and communications software. They are employed by computer hardware manufacturers and retailers, software developers, in call centres and in information technology units throughout the private and public sectors. Technicians in this group are also employed by independent technical support companies or they may be self-employed.

Job Duties

User support technicians perform some or all of the following duties:

- Communicate electronically and in person with computer users experiencing difficulties to determine and document problems experienced
- Consult user guides, technical manuals and other documents to research and implement solutions

Key Research Findings

- Emulate or reproduce technical problems encountered by users
- Provide advice and training to users in response to identified difficulties
- Provide business systems, network and Internet support to users in response to identified difficulties
- Collect, organize and maintain a problems and solutions log for use by other technical support analysts
- Participate in the redesign of applications and other software
- May supervise other technical support workers in this group.

Included Job Titles

- call centre agent – technical support, client support representative – systems, computer help desk representative – systems, computer help desk supervisor, hardware installation technician, hardware technical support analyst, help desk technician, software installation technician, software technical support analyst, systems support representative, technical support analyst – systems, technical support supervisor, user support technician.

NOC 0213 – Computer & Information Systems Manager

http://www.workingincanada.gc.ca/report-eng.do?lang=eng&noc=0213&area=8792&titleKeyword=computer+networks+manager&regionKeyword=Peterborough,Ontario&source=0&action=final

Description

Computer and information systems managers plan, organize, direct, control and evaluate the activities of organizations that analyze, design, develop, implement, operate and administer computer and telecommunications software, networks and information systems. They are employed throughout the public and private sectors.

Job Duties

Computer and information systems managers perform some or all of the following duties:

- Plan, organize, direct, control and evaluate the operations of information systems and electronic data processing (EDP) departments and companies
- Develop and implement policies and procedures for electronic data processing and computer systems operations and development
- Meet with clients to discuss system requirements, specifications, costs and timelines
- Assemble and manage teams of information systems personnel to design, develop, implement, operate and administer computer and telecommunications software, networks and information systems
- Control the budget and expenditures of the department, company or project
- Recruit and supervise computer analysts, engineers, programmers, technicians and other personnel and oversee their professional development and training.

Included Job Titles

- EDP (electronic data processing) manager, computer systems manager, data centre manager, data processing director, information systems manager, manager, data processing and systems analysis, manager, management information system (MIS), manager, software engineering, software development manager, systems development manager.

From Employment Ontario

Common Job Titles

Computer Operator

Key Research Findings

Computer Tape Librarian
Data Centre Operator
Internet Web Site Technician
LAN (Local Area Network) Administrator
LAN (Local Area Network) Technician
Network Administrator
Network Operator
Network Support Technician
Computer Operators Supervisor
System Administrator
Web Technician

Typical Employers
computer systems design and related services
information services
finance and insurance
public administration
wholesale trade
educational services
large corporations and establishments

http://www.tcu.gov.on.ca/eng/labourmarket/ojf/pdf/0213_e.pdf

Labour Market
Working in Canada
1. Employment potential for the Muskoka - Kawartha Region

NOC 2171	**NA**
NOC 2242	**NA**
NOC 2281	**NA**
NOC 2282	**NA**
NOC 0213	**NA**

HRDSC
2. National Outlook – 10-Year Projection (2011-2020)

This occupation (**Computer Systems Analyst)** is part of a larger occupational group called Computer & Information Systems Professionals (**NOC 217**).

http://www23.hrsdc.gc.ca/occupationsummarydetail.jsp?&tid=37

Occupations in this group	Information Systems Analysts and Consultants (2171),Database Analysts and Data Administrators (2172),Software Engineers (2173),Computer Programmers and Interactive Media Developers (2174),Web Designers and Developers (2175)

Key Research Findings

Employment (non-student) in 2010	372,786
Median Age of workers in 2010	39.5 years old
Average Retirement Age in 2010	61 years old

3. Estimated that there will be more job seekers in this field than job openings for the 2011-2020 periods (job openings are expected to total **152,836**. It is expected that **210,662** job seekers will be available to fill these job openings). Nearly all job seekers will come from the school system (63%) with 22% from immigration and 15% from "other"

4 Over the 2008-2010 period, employment growth in this occupation was strong. The unemployment rate increased more quickly than for all occupations but still remained below 5% in 2010. According to key labour market indicators, the number of job seekers was sufficient to fill all job openings in this occupation.

5. According to Employment Ontario (Estimates 2006), 12% of workers in this group were self-employed, and 92% Full-Time

6. Local wage for Peterborough/Kawartha Region 2010: NA

http://www.workingincanada.gc.ca/report-eng.do?lang=eng&noc=2171&area=8792&titleKeyword=computer+systems+analyst&regionKeyword=Peterborough,+Ontario&source=0&action=final

HRDSC

4. National Outlook – 10-Year Projection (2011-2020)

This occupation (**Computer Service Technician, Audio-Video Service Technician, Audio-Video Repair Technician)** is part of a larger occupational group called Technical Occupations In Electronics & Electrical Engineering (**224**).

http://www23.hrsdc.gc.ca/occupationsummarydetail.jsp?&tid=41

Occupations in this group	Electrical and Electronics Engineering Technologists and Technicians (2241),Electronic Service Technicians (Household and Business Equipment) (2242),Industrial Instrument Technicians and Mechanics (2243),Aircraft Instrument, Electrical and Avionics Mechanics, Technicians and Inspectors (2244)
Employment (non-student) in 2010	109,759
Median Age of workers in 2010	39.9
Average Retirement Age in 2010	59

5. For **Technical Occupations In Electronics And Electrical Engineering**, over the 2011-2020 period, job openings (arising from expansion demand and replacement demand) are expected to total **46,832** and **47,472** job seekers (arising from school leavers, immigration and mobility) are expected to be available to fill the job openings

Key Research Findings

Over the 2008-2010 period, employment in this occupation grew slightly but the unemployment rate also increased and did so more quickly than the average for all occupations. The average hourly wage for this occupation also increased a little more quickly than for all occupations. According to key labour market indicators, the number of job seekers was sufficient to fill the job openings in this occupation.

6. According to Employment Ontario the Opportunities for employment in this occupation are expected to be average over the period from 2009 to 2013.

7. According to Employment Ontario (Estimates 2006), 15% of workers in this group were self-employed, and 86% Full-Time

8. Local wage for Peterborough/Kawartha Region 2010:

Low $12.50 Median $22.00 High $39.00
http://www.workingincanada.gc.ca/report-eng.do?lang=eng&noc=2242&area=8792&titleKeyword=audio-video+service+technician&regionKeyword=Peterborough,+Ontario&source=0&action=final

http://www.tcu.gov.on.ca/eng/labourmarket/ojf/pdf/2242_e.pdf

HRDSC

5. National Outlook – 10-Year Projection (2011-2020)

This occupation (Computer Network Technician) is part of a larger occupational group called Technical Occupations in Computer and Information Systems (228)
http://www23.hrsdc.gc.ca/occupationsummarydetail.jsp?&tid=45

Occupations in this group	Computer and Network Operators and Web Technicians (2281) User Support Technicians (2282) Systems Testing Technicians (2283)
Employment (non-student) in 2010	119,034
Median Age of workers in 2010	37.4 years old
Average Retirement Age in 2010	59 years old

For **Technical Occupations in Computer and Information Systems**, over the 2011-2020 period, job openings (arising from expansion demand and replacement demand) are expected to total **49,381** and **61,004** job seekers (arising from school leavers 77%, immigration22% and mobility) are expected to be available to fill the job openings

Over the 2008-2010 period, this occupation experienced a significant drop in employment. The unemployment rate increased more quickly than for other occupations and was higher than the average. The average hourly wage increased at a rate similar to that for all occupations over this period. According to key labour market indicators, the number of job seekers was sufficient to fill the job openings in this occupation.
According to Employment Ontario the Opportunities for employment in this occupation are expected to be average over the period from 2009 to 2013.

Key Research Findings

According to Employment Ontario (Estimates 2006), 5% of workers in this group were self-employed, and 91% Full-Time
Local wage for Peterborough/Kawartha Region 2010:
Low $14.00 Median $22.69 High $46.15
http://www.workingincanada.gc.ca/report-eng.do?lang=eng&noc=2281&area=8792&titleKeyword=computer+network+technician&regionKeyword=Peterborough,+Ontario&source=1&action=final

http://www.tcu.gov.on.ca/eng/labourmarket/ojf/pdf/2281_e.pdf

HRDSC

6. National Outlook – 10-Year Projection (2011-2020)

This occupation (Computer Networks Manager) is part of a larger occupational group called Mangers In Engineering, Architecture, Science & Information Systems (021)

Occupations in this group	Engineering, Science and Architecture Managers (0210),Engineering Managers (0211),Architecture and Science Managers (0212),Information Systems and Data Processing Managers (0213)
Employment (non-student) in 2010	77,670
Median Age of workers in 2010	43.5 years old
Average Retirement Age in 2010	59 years old

For **Managers In Engineering, Architecture, Science And Information Systems**, over the 2011-2020 period, job openings (arising from expansion demand and replacement demand) are expected to total **39,068** and **37,400** job seekers (arising from school leavers 39%, immigration 15% and other 45%) are expected to be available to fill the job openings.
Over the 2008-2010 period, employment growth in this occupation was above the average for all occupations. However, the unemployment rate also increased. The average hourly wage increased at a lower rate than the average for all occupations; however, it is one of the highest among all the occupations. According to key labour market indicators, the number of job seekers was sufficient to fill the job openings in this occupation.
According to Employment Ontario the Opportunities for employment in this occupation are expected to be good over the period from 2009 to 2013.

According to Employment Ontario (Estimates 2006), 5% of workers in this group were self-employed, and 97% Full-Time
http://www.tcu.gov.on.ca/eng/labourmarket/ojf/pdf/0213_e.pdf

Local wage for Peterborough/Kawartha Region 2010:
Low $22.60 Median $40.00 High $58.65

http://www.workingincanada.gc.ca/report-eng.do?area=8792&lang=eng&noc=0213&action=final&regionKeyword=Peterborough%2COntario&s=1&source=3&titleKeyword=computer+networks+manager#wages

Key Research Findings

US Bureau of Labour

Computer Support Specialists

http://www.bls.gov/ooh/computer-and-information-technology/computer-support-specialists.htm#tab-6

Employment of computer support specialists is expected to grow 18 percent from 2010 to 2020, about as fast as the average for all occupations. More support services will be needed as organizations upgrade their computer equipment and software. Computer support staff will be needed to respond to the installation and repair requirements of increasingly complex computer equipment and software. Employment growth should also be strong in healthcare industries. This field is expected to greatly increase its use of information technology (IT), and support services will be crucial to keep everything running properly.
Some lower level tech support jobs, commonly found in call centers, may be sent to countries that have lower wage rates. However, a recent trend to move jobs to lower cost regions of the United States may offset some loss of jobs to other countries.

Job Prospects
Job prospects should be favorable. There are usually clear advancement possibilities for this occupation, creating new job openings. Applicants with a bachelor's degree and a strong technical background should have the best job opportunities.

Computer, ATM and Office Machine Repairers
http://www.bls.gov/ooh/installation-maintenance-and-repair/computer-atm-and-office-machine-repairers.htm

Employment of computer, ATM, and office machine repairers is expected to grow 7 percent from 2010 to 2020, slower than the average for all occupations.
Computer repairers will see a continued demand for their services as computer parts need replacing or organizations need hardware upgrades. As companies modernize and use new technology in their day-to-day operations, computer repairers will continue to see employment opportunities.
Office and machine repairers will also continue to see demand for their services as office equipment continues to break down and need preventive maintenance.
However, increasing use of electronic banking is causing a decline in the demand for new ATMs, which may result in a decreased need for ATM repairers.

Job Prospects
Workers with experience, education from a trade school, and some certification often will have the best opportunities. Employers also prefer to hire workers whose military service has provided them with relevant training and experience. ATM repairers with training in the security of ATM networks have the best job prospects.

Key Research Findings

Network & Computer Systems Administrators
http://www.bls.gov/ooh/computer-and-information-technology/network-and-computer-systems-administrators.htm

Employment of network and computer systems administrators is expected to grow 28 percent from 2010 to 2020, faster than the average for all occupations. Demand for these workers is high and should continue to grow as firms invest in newer, faster technology and mobile networks. In addition, information security concerns are increasing for many businesses as managers realize that their current security measures are not enough to combat growing threats. More administrators with proper training will be needed to reinforce network and system security.
Growth is expected in healthcare industries as their use of information technology increases. More administrators will be required to manage the growing systems and networks found at hospitals and other healthcare institutions.

Job Prospects
Job opportunities should be favorable for this occupation. Prospects should be best for applicants who have a bachelor's degree in computer science and who are up to date on the latest technology.

Electrical & Electronics Installers & Repairers

http://www.bls.gov/ooh/installation-maintenance-and-repair/electrical-and-electronics-installers-and-repairers.htm

Overall employment of electrical and electronics installers and repairers is expected to grow 3 percent from 2010 to 2020, slower than the average for all occupations.
Projected employment change for specific groups of workers within this occupation is as follows:

- Electrical and electronics installers and repairers of commercial and industrial equipment: little or no change. As competition increases, businesses strive to lower costs by increasing and improving automation. This equipment needs service and repair, and generally increases the demand for electrical workers, but improved reliability of equipment is expected to temper employment growth.
- Motor vehicle electronic equipment installers and repairers: 3 percent growth. As motor vehicle manufacturers install more and better sound, security, entertainment, and navigation systems in new vehicles, and as newer electronic systems require progressively less maintenance, employment growth for aftermarket electronic equipment installers will be limited.
- Electric motor, power tool, and related repairers: 5 percent growth. Retrofitting electrical generators in public buildings to reduce emissions and energy consumption will spur some employment growth. However, improvements in electrical and electronic equipment design, as well as the increased use of disposable tool parts, should limit employment growth.
- Electrical and electronic installers and repairers of transportation equipment: little or no change. Declining employment in the rail transportation industry will dampen growth in this occupational specialty even as other transportation systems need additional workers.
- Powerhouse, substation, and relay electrical and electronics installers and repairers: 5 percent growth. Although privatization in utilities industries should improve productivity and hinder employment growth, the installation of newer, energy-efficient green technologies will spur some demand for employment.

Job Prospects

Key Research Findings

Overall job opportunities should be best for applicants who have an associate's degree in electronics, certification, or related experience. In addition to employment growth, the need to replace workers who transfer to other occupations or leave the labor force will result in some job openings.

Professional Associations:

Canadian Technology Accreditation Board
http://www.cctt.ca/landing_4.asp

Ontario Association of Certified Engineering Technicians & Technologists
http://www.oacett.org/

Employment Requirements

http://www5.hrsdc.gc.ca/NOC/English/NOC/2011/Welcome.aspx

NOC2171	**Education Programs** Programs in the order in which they are most likely to supply graduates to this occupation (Information Systems Analysts and Consultants): • Computer Science • Computer and Information Sciences and Support Services, General • Business Administration, Management and Operations • Computer Engineering Technologies/Technicians • Business/Commerce, General **Employment Requirements** Employment requirements are prerequisites generally needed to enter an occupation. • 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. [Source: National Occupational Classification 2006 - HRSDC]
NOC 2242	**Education Programs** Programs in the order in which they are most likely to supply graduates to this occupation (Electronic Service Technicians (Household and Business Equipment)): • Electrical and Electronic Engineering Technologies/Technicians • Computer Engineering Technologies/Technicians • Electrical, Electronics and Communications Engineering • Computer Science • Electrical/Electronics Maintenance and Repair Technology E**mployment Requirements** Employment requirements are prerequisites generally needed to enter an occupation. • Completion of a two- to three-year college program in electronics *or*

Key Research Findings

	Completion of a four-year apprenticeship program in electronic servicing and repair *or* Completion of high school or college courses in electronics and on-the-job training is required. • Trade certification for electronic technician, consumer products is compulsory in Alberta and available, but voluntary, in Newfoundland and Labrador, Prince Edward Island, Nova Scotia, New Brunswick, Ontario, Manitoba, Saskatchewan, British Columbia, Nunavut, the Northwest Territories and the Yukon. • Interprovincial trade certification (Red Seal) is also available to qualified electronics technicians, consumer products. • In Quebec, membership in the regulatory body is required to use the title of Professional Technologist. [Source: National Occupational Classification 2006 - HRSDC] http://www.workingincanada.gc.ca/report-eng.do?area=8792&lang=eng&noc=2242&action=final&regionKeyword=Peterborough%2C+Ontario&s=5&source=0&titleKeyword=audio-video+service+technician#report_tabs_container2
NOC 2281	**Education Programs** Programs in the order in which they are most likely to supply graduates to this occupation (Computer Network Technicians): • Computer Science • Computer and Information Sciences and Support Services, General • Computer Engineering Technologies/Technicians • Electrical and Electronic Engineering Technologies/Technicians • Computer/Information Technology Administration and Management [Source: 2006 Census - Statistics Canada] **Local Training** Most universities and colleges in Ontario offer educational programs in the field of computer science and information technology. For more information on training opportunities at Ontario universities and colleges, please refer to the following websites: http://www.electronicinfo.ca www.ontariocolleges.ca. Private career colleges in Ontario may also have programs related to this occupation. More information can be found on the Ministry of Training, Colleges and Universities web site at: http://www.tcu.gov.on.ca/, when searched under Ontario Private Career College Search Service.' **Employment Requirements** Employment requirements are prerequisites generally needed to enter an occupation. • Completion of a college or other program in computer science, network administration, Web technology or a related field is usually required. • Certification or training provided by software vendors may be required by some employers. [Source: National Occupational Classification 2006 - HRSDC]

Key Research Findings

	Skills Requirements There are often specific abilities, aptitudes and knowledge that are prerequisites to obtain employment in an occupation. Most employers who advertise are looking for workers who have the following experience and skills: Experience: 1-5 years Specific Skills: Provide problem-solving services to network users. Maintain, troubleshoot and administer the use of local area networks (LANs), wide area networks (WANs). Perform routine network start up and close down and maintain control records. Evaluate and install computer hardware, networking software and operating system software. Computer and Technology Knowledge: Windows, networking hardware and software, servers and network security. Essential Skills: Oral communication, working with others, computer use, problem solving, job task planning and organizing, writing, reading text, document use, finding information, critical thinking, decision making, continuous learning and numeracy. [Source: Labour Market Information - HRSDC] http://www.workingincanada.gc.ca/report-eng.do?area=8792&lang=eng&noc=2281&action=final&regionKeyword=Peterborough%2C+Ontario&s=5&source=1&titleKeyword=computer+network+technician#report_tabs_container2
NOC 2282	**Education Programs** Programs in the order in which they are most likely to supply graduates to this occupation (User Support Technicians): • Computer Science • Computer and Information Sciences and Support Services, General • Computer Engineering Technologies/Technicians • Electrical and Electronic Engineering Technologies/Technicians • Computer/Information Technology Administration and Management [Source: 2006 Census - Statistics Canada] **Local Training** Most universities and colleges in Ontario offer educational programs in the field of computer science and information technology. For more information on training opportunities at Ontario universities and colleges, please refer to the following websites: http://www.electronicinfo.ca www.ontariocolleges.ca. Private career colleges in Ontario may also have programs related to this occupation. More information can be found on the Ministry of Training, Colleges and Universities

Key Research Findings

	website at: http://www.tcu.gov.on.ca/, when searched under `Ontario Private Career College Search Service.' **Employment Requirements** Employment requirements are prerequisites generally needed to enter an occupation. • Completion of a college program in computer science, computer programming or network administration is usually required. • College or other courses in computer programming or network administration are usually required. • Certification or training provided by software vendors may be required by some employers. [Source: National Occupational Classification 2006 - HRSDC] **Skills Requirements** There are often specific abilities, aptitudes and knowledge that are prerequisites to obtain employment in an occupation. Most employers who advertise are looking for workers who have the following experience and skills: Experience: 0-1 year Specific Skills: Communicate electronically and in person with computer users experiencing difficulties to determine and document problems experienced. Provide advice and training to users in response to identified difficulties. Consult user guides, technical manuals and other documents to research and implement solutions. Computer and Technology Knowledge: Windows and Internet. Essential Skills: Oral communication, working with others, computer use, problem solving, reading text, finding information, critical thinking, decision making and continuous learning. http://www.workingincanada.gc.ca/report-eng.do?area=8792&lang=eng&noc=2282&action=final&regionKeyword=Peterborough%2C+Ontario&s=5&source=0&titleKeyword=computer+help+desk+representative+-+systems#report_tabs_container2
NOC 0213	**Education Programs** Programs in the order in which they are most likely to supply graduates to this occupation (Computer and Information Systems Managers): • Computer Science • Business Administration, Management and Operations • Computer and Information Sciences and Support Services, General • Business/Commerce, General • Electrical, Electronics and Communications Engineering [Source: 2006 Census - Statistics Canada] **Local Training**

Key Research Findings

	Most universities and colleges in Ontario offer educational programs in the field of computer science and information technology and business administration. For more information on training opportunities at Ontario universities and colleges, please refer to the following websites: http://www.electronicinfo.ca www.ontariocolleges.ca Private career colleges in Ontario may also have programs related to this occupation. More information can be found on the Ministry of Training, Colleges and Universities web site at: http://www.tcu.gov.on.ca/, when searched under Ontario Private Career College Search Service.' **Employment Requirements** Employment requirements are prerequisites generally needed to enter an occupation. • A bachelor's or master's degree in computer science, business administration, commerce or engineering is usually required. • Several years of experience in systems analysis, data administration, software engineering, network design or computer programming, including supervisory experience, are required. [Source: National Occupational Classification 2006 - HRSDC] **Skills Requirements** There are often specific abilities, aptitudes and knowledge that are prerequisites to obtain employment in an occupation. Most employers who advertise are looking for workers who have the following experience and skills: Experience: 3-9 years Specific Skills: Plan, organize and direct daily operations. Assign, co-ordinate and review projects and programs. Oversee the analysis of data and information. Additional Skills: Plan and control budget and expenditures. Hire, train, direct and motivate staff. Essential Skills: Oral communication, working with others, computer use, problem solving, job task planning and organizing, writing, reading text, document use, finding information, critical thinking, decision making, continuous learning, numeracy and significant use of memory. http://www.workingincanada.gc.ca/report-eng.do?area=8792&lang=eng&noc=0213& action=final&regionKeyword=Peterborough%2COntario&s=5&source=3&titleKeyword=computer+networks+manager#report_tabs_container2