Area of Interest: Advanced Technology

Computer Systems Technician - Networking (Co-op and Non Co-op Version)

Ontario College Diploma Program Code: 1560X03FWO

2 Years

Ottawa Campus

Our Program

Pursue a technology career to support modern IT infrastructures.

The two-year Computer Systems Technician - Networking Ontario College Diploma program prepares you for a career in information technology with a focus on network and system administration.

You learn to set up, configure and maintain all components that constitute an effective network: computer hardware, operating systems, networking and virtualization technologies, security and task automation. In addition you develop problem solving skills and troubleshooting techniques to help support an IT infrastructure. Throughout the program, you also develop your oral and written communication skills, customer support, and ethics relevant to the information technology workplace.

As a student in this program, you have access to the latest software and equipment including Cisco and Aruba hardware labs, network-based operating systems, including Microsoft and GNU/Linux, as well as other industry-standard tools and resources.

You can work towards industry recognized certifications including Cisco Certified Network Associate (CCNA), CompTIA A+, CompTIA Network+, CompTIA Linux+ and Microsoft Technology Associate (MTA). Upon successful completion of this program, you may transfer credit for the first two years of the Computer Systems Technology - Security three-year Ontario College Advanced Diploma, as long as you meet its admissions requirements.

Students also have the option to gain real-world experience through a paid co-operative education (co-op) work term (see Additional Information for more details). Please note that places in the co-op work term are subject to availability and academic eligibility. Please note admission to the co-op program does not guarantee a co-op placement.

Upon graduation you may find employment opportunities in a wide range of sectors including government, private and public for entry-level positions or self-employment in:

- network and systems administration
- IT infrastructure
- installation, migration, and support
- technical and customer service support
- computer training and consultation

SUCCESS FACTORS

This program is well-suited for students who:

- Have proven problem-solving and analytical skills.
- Enjoy implementing and troubleshooting computer technology, operating systems and networking technology solutions.

- Enjoy the challenges posed by a constantly evolving field.
- Can work both independently and in a team environment.

Employment

Graduates of this program may find employment as:

- junior system and network installer and/or administrators
- technical support specialists
- customer service support representatives
- computer trainers
- hardware and software sales and support

Learning Outcomes

The graduate has reliably demonstrated the ability to:

- Identify, analyze, develop, implement, verify and document the requirements for a computing environment.
- Contribute to the diagnostics, troubleshooting, documenting and monitoring of technical problems using appropriate methodologies and tools.
- Implement and maintain secure computing environments.
- Implement robust computing system solutions through validation testing that aligns with industry best practices.
- Communicate and collaborate with team members and stakeholders to ensure effective working relationships.
- Select and apply strategies for personal and professional development to enhance work performance.
- Apply project management principles and tools when working on projects within a computing environment.
- Adhere to ethical, legal, and regulatory requirements and/or principles in the development and management of computing solutions and systems.
- Assist with the implementation of computer systems and cloud solutions.
- Install, configure, troubleshoot, maintain, upgrade and decommission information systems infrastructure.
- Automate routine tasks using scripting tools and programming languages.
- Install and monitor a database management system in response to specified requirements.
- Provide technical support for information system infrastructure that aligns with industry best practice.
- Design, deploy and administer robust network infrastructures and cloud solutions.
- Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.

Program of Study

Level: 01	Courses	Hours
CST8182	Networking Fundamentals	70.0
CST8202	Windows Desktop Support	56.0
CST8207	GNU/Linux System Support	70.0
CST8300	Achieving Success in Changing Environments	42.0
ENL1813T	Communications I	42.0
MAT8002	Numeracy and Logic	42.0
Level: 02	**Courses**	**Hours**
CST8200	Windows Domain Administration	70.0
CST8208	PC System Technology	56.0
CST8305	GNU/Linux Server Administration	56.0
CST8315	Routing and Switching Fundamentals	70.0
ENL8720	Technical Communication for Technicians	42.0
GEP1001	Cooperative Education and Job Readiness	18.0
Choose one from equivalencies:	**Courses**	**Hours**
GED1560	General Education Elective	42.0
Level: 03	**Courses**	**Hours**
CST8206	Foundation of IT Service Management	42.0
CST8245	Database Management and Interfacing	56.0
CST8246	Network Services Administration	56.0
CST8316	PC Troubleshooting	56.0
CST8342	Windows Enterprise Administration	70.0
CST8371	Introduction to Enterprise Networking	70.0
Co-op: 01	**Courses**	**Hours**
WKT8001	Work Term I	
Co-op: 02	**Courses**	**Hours**
WKT8002	Work Term II	
Level: 04	**Courses**	**Hours**
CST8248	Emerging Technologies	56.0
CST8249	Network Security	70.0
CST8317	Wireless Network Fundamentals	56.0
CST8378	Advanced Enterprise Networking	56.0

Choose one from equivalencies:	Courses	Hours
GED1560	General Education Elective	42.0

Fees for the 2023/2024 Academic Year

Tuition and related ancillary fees for this program can be viewed by using the Tuition and Fees Estimator tool at https://www.algonquincollege.com/fee-estimator .

Further information on fees can be found by visiting the Registrar`s Office website at https://www.algonquincollege.com/ro .

Fees are subject to change.

Additional program related expenses include:

- Textbooks and supplies can be purchased at the campus store.
- For more information, go to https://www.algonquincollege.com/coursematerials .

Admission Requirements for the 2024/2025 Academic Year

College Eligibility

- Ontario Secondary School Diploma (OSSD) or equivalent. Applicants with an OSSD showing senior English and/or Mathematics courses at the Basic Level, or with Workplace or Open courses, will be tested to determine their eligibility for admission; OR
- Academic and Career Entrance (ACE) certificate; OR
- General Educational Development (GED) certificate; OR
- Mature Student status (19 years of age or older and without a high school diploma at the start of the program). Eligibility may be determined by academic achievement testing for which a fee of $50 (subject to change) will be charged.

Program Eligibility

- English, Grade 12 (ENG4C or equivalent).
- Mathematics, Grade 12 (MAP4C or equivalent).
- Applicants with international transcripts must provide proof of the subject-specific requirements noted above and may be required to provide proof of language proficiency. Domestic applicants with international transcripts must be evaluated through the International Credential Assessment Service of Canada (ICAS) or World Education Services (WES).
- IELTS-International English Language Testing Service (Academic) Overall band of 6.0 with a minimum of 5.5 in each band; OR TOEFL-Internet-based (iBT)-overall 80, with a minimum of 20 in each component: Reading: 20; Listening: 20; Speaking: 20; Writing: 20; OR Duolingo English Test (DET) Overall 110, minimum of 110 in Literacy and no score below 95.

Not sure if you meet all of the requirements? Academic Upgrading may be able to help with that: https://www.algonquincollege.com/access/ .

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Application Information

COMPUTER SYSTEMS TECHNICIAN - NETWORKING (CO-OP AND NON CO-OP VERSION)
Program Code 1560X03FWO

Applications to full-time day programs must be submitted with official transcripts showing completion of the academic admission requirements through:

ontariocolleges.ca
60 Corporate Court
Guelph, Ontario N1G 5J3
1-888-892-2228

Students currently enrolled in an Ontario secondary school should notify their Guidance Office prior to their online application at http://www.ontariocolleges.ca/ .

Applications for Fall Term and Winter Term admission received by February 1 will be given equal consideration. Applications received after February 1 will be processed on a first-come, first-served basis as long as places are available.

International applicants please visit this link for application process information: https://algonquincollege.force.com/myACint/ .

For further information on the admissions process, contact:

Registrar`s Office
Algonquin College
1385 Woodroffe Ave
Ottawa, ON K2G 1V8
Telephone: 613-727-0002
Toll-free: 1-800-565-4723
TTY: 613-727-7766
Fax: 613-727-7632
Contact: https://www.algonquincollege.com/ro

Additional Information

CO-OP INFORMATION:
All applicants apply directly to the co-op version of this program through http://www.ontariocolleges.ca/ or our International Application Portal. Applicants not wishing to pursue the co-op version will have the opportunity to opt-out after being admitted to the program

but prior to the first co-op work term.

Co-operative education (Co-op) allows students to integrate their classroom learning with a real-world experience through paid work terms. Two academic terms prior to the cooperative education work term, students are required to actively participate in and successfully complete the self-directed co-op course, readiness activities and workshops.

Students must actively conduct a guided, self-directed job search and are responsible for securing approved program-related paid co-op
employment. Students compete for co-op positions alongside students from Algonquin College and other Canadian and international colleges and universities. Algonquin College`s Co-op Department provides assistance in developing co-op job opportunities and guides the overall process, but does not guarantee that a student will obtain employment in a co-op work term. Co-op students may be required to relocate to take part in the co-op employment opportunities available in their industry and must cover all associated expenses; e.g., travel, work permits, visa applications, accommodation and all other incurred expenses.

Co-op work terms are typically 14 weeks in duration and are completed during a term when students are not taking courses. For more information on your program`s co-op level(s), visit the courses tab on your program`s webpage.

International students enrolled in a co-op program are required by Immigration, Refugees and Citizenship Canada (IRCC) to have a valid Co-op/Internship Work Permit prior to commencing their work term. Without this document International students are not legally eligible to engage in work in Canada that is part of an academic program. The Co-op/Internship Work Permit does not authorize international students to work outside the requirements of their academic program.

For more information on co-op programs, the co-op work/study schedule, as well as general and program-specific co-op eligibility criteria, please visit https://www.algonquincollege.com/coop .

Contact Information

Program Coordinator(s)

- Melissa Sienkiewicz, mailto:coordcst@algonquincollege.com , 613-727-4723

Course Descriptions

CST8182 Networking Fundamentals

The modern world is connected and networking technologies form the foundation of data communication. Students describe the architecture, topology, protocols, components and models of the Internet and other computer networks. Based on the OSI and TCP layered models students examine the function of protocols and services at each layer of the TCP/IP protocol suite. Students design an IP addressing scheme for simple LAN topologies and apply the design to a simple network built using routers and switches.

Prerequisite(s): none
Corerequisite(s):none

CST8200 Windows Domain Administration

Microsoft Windows Server is an enterprise-level operating system that supports the computing requirements of a modern business. Students manage an MS Windows domain network with Active Directory and Group Policies. Students explore different server roles and domain configurations, install MS Windows server domain controllers, setup centralized management with Active Directory and Group Policies and automate system administration tasks using PowerShell. In addition, students explore virtualization concepts supported by MS Windows.

Prerequisite(s): CST8202
Corerequisite(s):none

CST8202 Windows Desktop Support

Microsoft Windows desktop is a commonly implemented desktop operating system in industry.

Students prepare a MS Windows client system for participation in a Windows-based network. Through a combination of theory and hands-on lab, students install and configure the operating environment of a Windows desktop operating system, manage resources by applying common security principles, automate tasks using PowerShell and troubleshoot common error conditions.

Prerequisite(s): none
Corerequisite(s):none

CST8206 Foundation of IT Service Management

Technical customer support is an essential business service, and knowledge of IT Service Management, as described in the IT Infrastructure Library (ITIL), is required to work in an ITIL compliant organization as part of a service team. Students explain common structures and explore best practices of service management with a focus on ITIL. In addition, students practice soft skills, such as effective listening and communication to establish professional relationships with customers that have IT related issues and requests.

Prerequisite(s): none
Corerequisite(s):none

CST8207 GNU/Linux System Support

GNU/Linux is an open-source operating system that operates on a variety of computing devices such as mobile devices, server systems and supercomputers. Students apply the basic concepts, features and commands to setup, configure and manage a stand-alone GNU/Linux operating system. Students explore the flexibility of the GNU/Linux command line, the use of simple utilities to perform increasingly complex management tasks and the basics of shell scripting to simplify repetitive tasks.

Prerequisite(s): none
Corerequisite(s):none

CST8208 PC System Technology

Computer technology is built upon hardware, which requires regular maintenance as well as periodic upgrading and repair. Students work with PC hardware technologies in laptops, desktops and servers. Students explain the functionality and interaction of computer components and peripherals and identify standards of system components to ensure compatibility. In the hands-on lab students assemble PCs, and install and configure PC components.

Prerequisite(s): CST8202
Corerequisite(s):none

CST8245 Database Management and Interfacing

Data as a business asset requires the implementation of data storage and management technologies. Students explain the theoretical concepts of relational database systems, practice database server setup and management, design a database based on business requirements and manipulate data using SQL. In addition, students apply programming principles to build a management interface for a relational database using Python.

Prerequisite(s): CST8305
Corerequisite(s):none

CST8246 Network Services Administration

The client-server model, an essential part of network computing, enables client systems to use services, such as email or web services, over the Internet. Students configure essential network services based on the client-server model: students setup and maintain common client-server services by installing the server, establishing network connectivity and configuring the service protocol to support connections from multiple clients. Students are expected to research and troubleshoot failed connections, system errors and service errors. Fundamental problem-solving methodologies, independent research and teamwork are complementary course components.

Prerequisite(s): CST8305
Corerequisite(s):none

CST8248 Emerging Technologies

Computing solutions are currently migrating from an onsite IT department to a cloud service provider. Students examine current and emerging technologies in the context of cloud-based computing, apply virtualization concepts and work with virtualization technologies to support the shift from the traditional on premise IT infrastructure to cloud infrastructure. Students also get hands on experience researching and troubleshooting real world computing issues.

Prerequisite(s): CST8246 and CST8342 and CST8371
Corerequisite(s):none

CST8249 Network Security

The objective of network security is to maintain access to network resources for legitimate users and is an integral part of network administration. Students describe the guiding principles and practical applications of information technology security, such as the goals of computer security, common threats and counter measures. Further, students analyze network monitoring data for security threats, implement network security technologies on several operating system platforms and examine incident response handling processes.

Prerequisite(s): CST8245 and CST8246 and CST8342 and CST8371
Corerequisite(s):none

CST8300 Achieving Success in Changing Environments

Rapid changes in technology have created personal and employment choices that challenge each of us to find our place as contributing citizens in the emerging society. Life in the 21st century presents significant opportunities, but it also creates potential hazards and ethical problems that demand responsible solutions. Students explore the possibilities ahead, assess their own aptitudes and strengths, and apply critical thinking and decision-making tools to help resolve some of the important issues in our complex society with its competing interests.

Prerequisite(s): none
Corerequisite(s):none

CST8305 GNU/Linux Server Administration

The GNU/Linux operating system, known for its flexibility and stability, is implemented as a server solution in a variety of business establishments. Students configure and administer a GNU/Linux server system by setting up and networking the operating system, managing a multi-user environment and configuring essential system services. As an integral part of server administration students troubleshoot common system and service errors, apply hardening principles to secure the system and write scripts to perform routine management functions.

Prerequisite(s): CST8207
Corerequisite(s):none

CST8315 Routing and Switching Fundamentals

A fundamental concept of networking is to connect network segments. Students implement switched networks based on industry standard design and protocols, and connect using simple routing configurations. To improve the robustness of switched network setups, students apply security controls and provide redundancy at the data-link layer. In addition, students configure a small wireless network.

Prerequisite(s): CST8182
Corerequisite(s):none

CST8316 PC Troubleshooting

A problem solving methodology is the foundation for effectively troubleshooting computing problems to support IT infrastructures. Students develop a systematic approach to troubleshooting hardware, operating systems and software problems. To identify and correct symptoms and faults found in PC-based systems, students apply problem analysis, methodology and techniques and investigate industry troubleshooting tools and utility software. In addition, students explore preventive and corrective measures in order to increase system reliability and minimize downtime. Labs are designed to test students troubleshooting skills using a series of computer systems with pre-set problems.

Prerequisite(s): CST8208
Corerequisite(s):none

CST8317 Wireless Network Fundamentals

Wireless networks enable enterprises to expand their network access beyond a wired infrastructure. Students describe the fundamentals of the 802.11 wireless protocol family, features and functions of wireless LAN components, and WLAN design and WLAN security and design issues. In the practical course component, students install, configure, and troubleshoot wireless LAN hardware peripherals and implement Wi-Fi authentication protocols.

Prerequisite(s): CST8371 or MAT8002
Corerequisite(s):none

CST8342 Windows Enterprise Administration

Modern enterprise-level IT solutions include on-site network service administration, as well as cloud integration. To optimize the management of enterprise-level MS Windows networks, students configure multi-master domain environments, setup MS Windows server roles, build virtualization solutions and examine Azure, Microsoft's public cloud computing platform. In addition, students implement email, an essential business communication tool, with MS Exchange mail server.

Prerequisite(s): CST8200
Corerequisite(s):none

CST8371 Introduction to Enterprise Networking

Network scalability features are an integral part of Enterprise network administration. Students configure dynamic routing protocols, develop scalable addressing schemes using network address translation (NAT) and IPv6 and assess redundant network designs. In addition, students continue to develop strategies to enhance network security with a practical focus on traffic filtering. Lastly, students explore network monitoring tools and techniques.

Prerequisite(s): CST8315
Corerequisite(s):none

CST8378 Advanced Enterprise Networking

Enterprise campus networks continue to evolve and scale to provide vital services to all users. Local area networks (LANs) and wide area network (WANs) connectivity must converge quickly and experience minimal downtime. In this course, students learn about technologies and features to improve the operation of an enterprise network. Students configure and optimize a redundant Layer 2 and 3 switched enterprise campus network infrastructure. Students implement advanced IPv4 and IPv6 OSPF features to improve routing performance and configure WAN connectivity using Multi-Protocol - Border Gateway Protocol (MP-BGP). Finally, they learn how Quality of Service (QoS) is deployed in an enterprise network and explore evolving technologies including network virtualization and network programmability.

Prerequisite(s): CST8371 or CST8271
Corerequisite(s):none

ENL1813T Communications I

Communication remains an essential skill sought by employers, regardless of discipline or field of study. Using a practical, vocation-oriented approach, students focus on meeting the requirements of effective communication. Through a combination of lectures, exercises, and independent learning, students practise writing, speaking, reading, listening, locating and documenting information and using technology to communicate professionally. Students develop and strengthen communication skills that contribute to success in both educational and workplace environments.

Prerequisite(s): none
Corerequisite(s):none

ENL8720 Technical Communication for Technicians

Clear, concise and detailed communication is essential for technical workplaces. Students plan and execute a variety of formal and informal visual, oral and written communication tasks. Exercises and activities foster confidence and competence in workplace communication.

Prerequisite(s): ENL1813T
Corerequisite(s):none

GED1560 General Education Elective

Students choose one course, from a group of general education electives, which meets one of the following four theme requirements: Arts in Society, Civic Life, Social and Cultural Understanding, and Science and Technology.

Prerequisite(s): none
Corerequisite(s):none

GED1560 General Education Elective

Students choose one course, from a group of general education electives, which meets one of the following four theme requirements: Arts in Society, Civic Life, Social and Cultural Understanding, and Science and Technology.

Prerequisite(s): none
Corerequisite(s):none

GEP1001 Cooperative Education and Job Readiness

Students are guided through a series of activities that prepare them to conduct a professional job search and succeed in the workplace. Through a detailed orientation students learn the cooperative education program policies and procedures related to searching and securing a work term opportunity. Students identify their strengths and transferable skills and participate in workshop-style sessions that focus on cover letter and resume development, interview techniques and job search strategies. Students learn how to navigate a web-based resource centre, which is used to post employment and cooperative education job opportunities. Students reflect on workplace success, ethics and responsibilities.

Prerequisite(s): none
Corerequisite(s):none

MAT8002 Numeracy and Logic

Students acquire the knowledge to work with numerical systems and internal machine representations, binary/hex/octal/decimal math, Boolean logic and truth tables. Students examine introductory level statistical methods and basic probability rules.

Prerequisite(s): none
Corerequisite(s):none

WKT8001 Work Term I

Students complete a cooperative work term, and submit a written report which documents the location of employment and the duties performed.

Prerequisite(s): none
Corerequisite(s):none

WKT8002 Work Term II

Students complete a cooperative work term, and submit a written report which documents the location of employment and the duties performed.

Prerequisite(s): WKT8001
Corerequisite(s):none