Ontario College of Teachers

Ordre des enseignantes et des enseignants de l'Ontario

Additional Qualification Course Guideline Teaching Computer Technology – Networking

Schedule F
Teachers' Qualifications Regulation

March 2017

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Additional Qualification Course Guideline Teaching Computer Technology – Networking

1. Introduction

The Schedule F *Teaching Computer Technology – Networking* Additional Qualification course guideline provides a conceptual framework (Figure 1) for providers and instructors to develop and facilitate the Schedule F *Teaching Computer Technology – Networking* course. This guideline framework is intended to be a fluid, holistic and integrated representation of key concepts associated with teaching computer technology and networking.

The Additional Qualification (AQ) course guideline for *Teaching Computer Technology – Networking* is organized using the following conceptual framework,
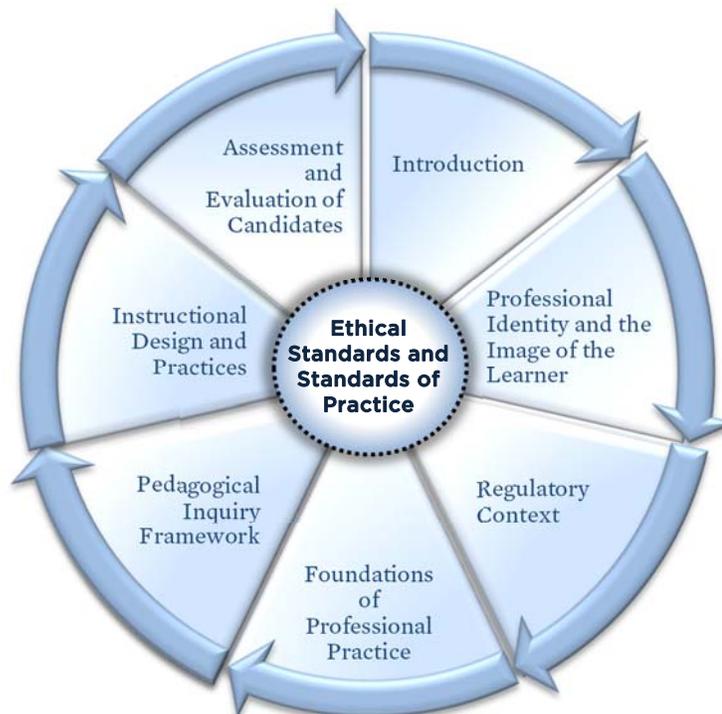

Figure 1: Conceptual Framework

Teachers are able to take the Additional Qualification Course: *Teaching Computer Technology – Networking* if they hold a technological education qualification at Grades 9 and 10 or Grades 11 and 12 in the broad-based area of teaching computer technology.

The Additional Qualification Course: *Teaching Computer Technology – Networking* employs a critical, pedagogical lens to explore in a holistic and integrated manner theoretical foundations, learning theory, program planning, development and implementation, instructional design and practices, assessment and evaluation, the learning environment, research and ethical considerations related to teaching and learning across the divisions. Through these explorations, candidates strengthen professional efficacy by gaining in-depth knowledge, refining professional judgment and generating new knowledge for practice.

Teachers qualified in *Teaching Computer Technology – Networking* facilitate active inquiry-based learning by combining knowledge of student development and learning with knowledge and understanding of subject matter, pedagogy and technological expertise. Successful candidates of this AQ will demonstrate technical proficiency in each of the technologies identified in *Part 8, Demonstrated Competence* in *Teaching Computer Technology – Networking*.

AQ Course Implementation

Course providers, instructors and developers will use this AQ guideline framework to inform the emphasis given to key guideline concepts in response to candidates' diverse professional contexts, knowledge, skills and understandings.

Critical to the holistic implementation of this course is the modeling of a positive learning environment that reflects care, diversity and equity. This course supports the enhancement of professional knowledge, ethical practice, leadership and ongoing professional learning.

The Ontario College of Teachers recognizes that candidates working in the publicly funded school system, independent/private institutions or First Nations schools will have a need to explore topics and issues of particular relevance to the context in which they work or may work.

Provincial Context

The French language and the English language communities will also need to implement these guidelines to reflect the unique contextual dimensions and needs of each community. Each of these language communities will explore the guideline content from distinct perspectives and areas of emphasis. This flexibility will enable both language communities to implement *Teaching Computer Technology – Networking* as understood from a variety of contexts.

In this document, all references to "candidates" are to teachers enrolled in the Additional Qualification course. References to "students" indicate those enrolled in school programs.

2. Professional Identity and the Image of the Learner

The professional identity of the AQ course instructor and course candidates conveyed in this AQ course guideline reflects the vision of the educator articulated in the *Ethical Standards for the Teaching Profession,* the *Standards of Practice for the Teaching Profession* and the *Professional Learning Framework for the Teaching Profession.*

This vision of the educator (Figure 2) positions professional educators as innovative scholars and practitioners, critical pedagogues who forward social and ecological justice, as well as:
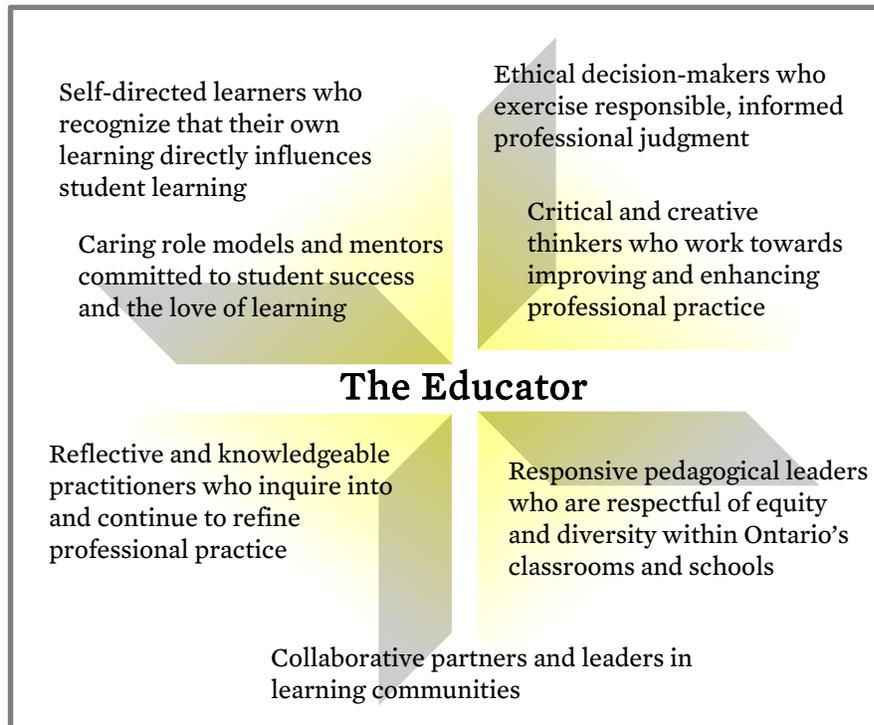
Self-directed learners who recognize that their own learning directly influences student learning

Caring role models and mentors committed to student success and the love of learning

Ethical decision-makers who exercise responsible, informed professional judgment

Critical and creative thinkers who work towards improving and enhancing professional practice

The Educator

Reflective and knowledgeable practitioners who inquire into and continue to refine professional practice

Responsive pedagogical leaders who are respectful of equity and diversity within Ontario's classrooms and schools

Collaborative partners and leaders in learning communities

Figure 2: Image of the Educator[1]

The image of the student conveyed in this AQ (Figure 3) is of a learner who is empowered, independent, a democratic citizen, knowledgeable, creative, collaborative, a critical thinker, ethical, reflective, accepting, inclusive, courageous, self-efficacious, a problem-solver, and whose voice and sense of efficacy are integral to shaping the teaching and learning process.

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[1] *Note.* From "The Foundations of Professional Practice," by Ontario College of Teachers, 2016, p. 16. Copyright 2016 by Ontario College of Teachers. Reprinted with permission.
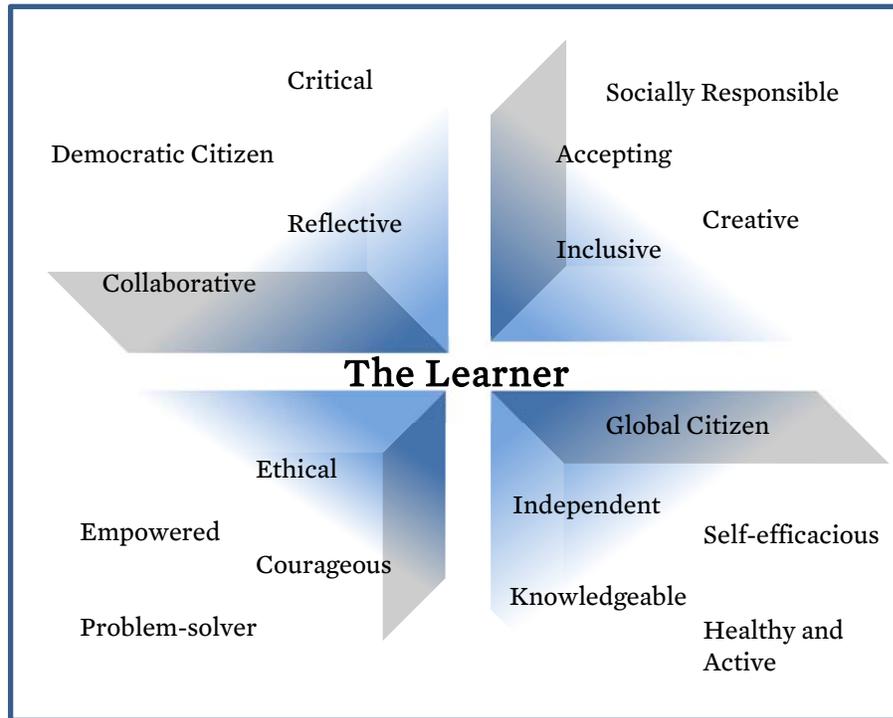
Figure 3: Image of the Learner

3. Regulatory Context

The College is the self-regulating body for the teaching profession in Ontario. The College's responsibility related to courses leading to Additional Qualifications includes the following:

- to establish and enforce professional standards and ethical standards applicable to members of the College
- to provide for the ongoing education of members of the College
- to accredit Additional Qualification courses and more specifically,

    The program content and expected achievement of persons enrolled in the program match the skills and knowledge reflected in the College's "Standards of Practice for the Teaching Profession" and the "Ethical Standards for the Teaching Profession" and in the program guidelines issued by the College. (Regulation 347/02, *Accreditation of Teacher Education Programs,* Part IV, Subsection 24).

Additional Qualifications for teachers are identified in the *Teachers' Qualifications Regulation* (Regulation 176/10). This regulation includes courses that lead to Additional Qualifications, the Principals' Development Qualification, the Principal's Qualifications, the Primary Division, the Junior Division and the Supervisory Officer's Qualifications. A session of a course leading to an Additional Qualification shall consist of a minimum of 125 hours as approved by the Registrar. Accredited Additional Qualification courses reflect the *Ethical Standards for the Teaching Profession,* the *Standards of Practice for the Teaching Profession* and the *Professional Learning Framework for the Teaching Profession.*

The AQ course developed from this guideline is open to candidates who meet the entry requirements identified in the *Teachers' Qualifications Regulation.*

Successful completion of Additional Qualification Course: *Teaching Computer Technology – Networking,* listed in Schedule F of the *Teachers' Qualifications Regulation,* is recorded on the Certificate of Qualification and Registration.

4. Foundations of Professional Practice

The *Foundations of Professional Practice* conveys a provincial vision of what it means to be a teacher in Ontario. This vision lies at the core of teacher professionalism. The *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* (Appendix 1) are the foundation for the development and implementation of the Additional Qualification course. These nine standards, as principles of professional practice, provide the focus for ongoing professional learning in the Additional Qualification Course: *Teaching Computer Technology – Networking.* In addition, the *Professional Learning Framework for the Teaching Profession* is underpinned by the standards, articulates the principles on which effective teacher learning is based and acknowledges a range of options that promote continuous professional learning.

The ongoing enhancement of informed professional judgment, which is acquired through the processes of lived experience, inquiry and critical reflection, is central to the embodiment of the standards and the *Professional Learning Framework for the Teaching Profession* within this AQ course and professional practice.

The *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* serve as guiding frameworks that underpin professional knowledge, skills and experiences that teachers require in order to teach effectively within and contribute to an environment that fosters *respect, care, trust* and *integrity*.

Teacher Education Resources

The College has developed resources to support the effective integration of the standards within Additional Qualification courses. These teacher education resources explore the integration of the standards within professional practice through a variety of educative, research and inquiry-based processes. These resources can be found on the College web site:
http://www.oct.ca/resources/categories/professional-standards-and-designation

These teacher education resources support the development of professional knowledge, judgment and efficacy through critical reflective praxis. The lived experiences of Ontario educators are illuminated in these teacher education resources and serve as key supports for AQ courses.

5. Pedagogical Inquiry Framework

The pedagogical inquiry framework (Figure 4) for *Teaching Computer Technology – Networking* supports a holistic, integrated, experiential and inquiry-based AQ course. This pedagogical inquiry framework supports the professional knowledge, judgment, critical pedagogies and practices of course candidates.

Figure 4: Pedagogical Inquiry Framework for
Teaching Computer Technology – Networking

A. The Ethical Standards for the Teaching Profession and the Standards of Practice for the Teaching Profession

The *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* represent a collective vision of professional practice. At the heart of a strong and effective teaching profession is a commitment to students and their learning. Members of the Ontario College of Teachers, in their position of trust, demonstrate responsibility in their relationships with students, parents, guardians, colleagues, educational partners, other professionals, the environment and the public.

The holistic integration of the standards within all course components supports the embodiment of the collective vision of the teaching profession

that guides professional knowledge, learning and practice. The following principles and concepts support this holistic integration within the AQ course.

- understanding and embodying care, trust, respect and integrity

- fostering commitment to students and student learning

- integrating professional knowledge

- enriching and developing professional practice

- supporting leadership in learning communities

- engaging in ongoing professional learning.

Course candidates will continue to critically inquire into professional practices, pedagogies and ethical cultures through professional dialogue, collaborative reflection and the lenses of the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession*.

B. Guiding Concepts for Pedagogical Inquiry

The following theoretical concepts are provided to facilitate the holistic design and implementation of this AQ course through pedagogical and professional inquiries.

This Additional Qualification course supports critical reflective inquiry and dialogue informed by the following concepts which will be critically explored through holistic and interrelated processes:

- critically exploring assumptions, beliefs and understandings associated with teaching and learning within the context of this AQ

- critically exploring the professional identity and practices associated with the views of teachers as co-inquirers, teacher scholars and teacher researchers working alongside student researchers in the co-creation of democratic, knowledge-rich learning environments

- critically exploring and interpreting Ontario's curriculum, policies, frameworks, strategies and guidelines related to the Broad Based Technology

- collaboratively examining and integrating the meaningful and respectful inclusion of First Nations, Métis and Inuit ways of knowing, cultures, histories and perspectives in teaching and learning processes as valid means to understand the world

- critically exploring multiple ways of knowing and being in community
- applying critical pedagogy as a theoretical foundation for the design, assessment and implementation of practices and/or programs
- critically exploring pedagogical processes and assessment and evaluation practices that link curriculum to student interests, strengths, inquiries, needs, resiliency, well-being and mental health
- critically examining processes, practices and policies to create and sustain holistic learning environments that nurture the intellectual, social, emotional, physical, linguistic, cultural, spiritual and moral development of the student
- engaging and collaborating with school personnel, parents/guardians, caregivers, the community, local business and industry as it relates to *Teaching Computer Technology – Networking*
- critically exploring engagement processes and practices that foster collaboration with in-school personnel, parents/guardians and the community to support student learning, resiliency and well-being
- critically exploring and integrating a variety of resources, including technological and communication resources, to enhance professional knowledge in support of student learning, independence, well-being and agency
- critically exploring professional practice through ongoing collaborative inquiry, dialogue, reflection, innovation and critical pedagogy
- critically examining the ethical principles, ethical knowledge and ethical actions that contribute to collective ethical pedagogy and leadership
- critically exploring and integrating environmentally sustainable practices, policies and pedagogies
- critically examining processes to foster responsible and active environmental stewardship and democratic citizenship
- collaboratively exploring the co-construction of communities of inquiry committed to critical pedagogy, ongoing professional learning and collective professional efficacy
- critically exploring innovative practices for integrating information and communication technology to enhance teaching and learning

- critically examining the processes involved in creating and sustaining safe, healthy, equitable, holistic and inclusive learning environments that honour and respect diversity, facilitate student learning, foster student voice, encourage critical thinking and promote social justice

- critically examining qualitative and quantitative research associated with professional practices, policies and pedagogies in support of student learning, empowerment and agency

- critically exploring and integrating educational processes, practices and policies that support students' well-being, resiliency, efficacy and mental health

- critically exploring and integrating inclusive processes for fostering interprofessional collaboration that support the collaborative development and implementation of Individual Education Plans (IEPs) and Transition Plans for students

- critically examining processes, practices and policies that contribute to a school and/or system culture of inquiry that promotes openness to innovation, change, culturally inclusive pedagogies and the democratization of knowledge

- critically exploring and integrating emerging technologies that support *Teaching Computer Technology – Networking*

- critically reflecting on health and safety risks associated with *Teaching Computer Technology – Networking*

- critically applying knowledge and skills to create and maintain a safe learning environment that addresses program needs: curriculum, material handling, tool handling and equipment storage, supervision, safety standards and practices that are respectful of the environment

- collaboratively exploring and integrating technological literacy related to *Teaching Computer Technology – Networking*

- designing and managing portfolios as well as developing written technical reports

- critically exploring and integrating mathematical literacy in *Teaching Computer Technology – Networking*

- collaboratively exploring business management and entrepreneurial practices related to *Teaching Computer Technology – Networking*

- collaboratively and critically inquiring into practice through reflection, active engagement and innovation

- critically reflecting on the various professional practices and career opportunities associated with *Teaching Computer Technology – Networking*

- critically exploring and integrating differentiated instruction, universal design and experiential learning to support student growth and development.

C. Ontario Context: Curriculum, Policies, Legislation, Frameworks, Strategies and Resources

The Additional Qualification Course: *Teaching Computer Technology – Networking* is aligned with current Ontario curriculum, relevant legislation, government policies, frameworks, strategies and resources. These documents inform the design, development and implementation of the Additional Qualification Course: *Teaching Computer Technology – Networking* and can be viewed at www.edu.gov.on.ca.

Course candidates are also encouraged to critically explore the policies, practices and resources available at school, board and provincial levels that inform teaching and learning related to *Teaching Computer Technology – Networking*.

D. Theoretical Foundations of Teaching Computer Technology – Networking

The exploration of the following guiding concepts will be facilitated through holistic and interrelated inquiry processes:

- critically exploring various theoretical frameworks underpinning this AQ, the principles fundamental to these frameworks and their practical applications in supporting student learning

- critically exploring the relevance of critical pedagogy and constructivist theories as theoretical foundations for this AQ

- critically exploring current theoretical research, literature and scholarship related to this AQ

- critically exploring the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* as theoretical foundations for teacher professionalism within the Additional Qualification Course: *Teaching Computer Technology – Networking*

- critically reflecting on teaching practice and engaging in professional dialogue regarding the relationship between theory and practice, as well as between practice and theory

- critically exploring critical pedagogy that is committed to curriculum design using students' inquiry questions, passions and interests

- critically exploring theories of child and adolescent development

- critically exploring Ontario curriculum, resources and government policies, frameworks and strategies related to *Teaching Computer Technology – Networking*

- critically exploring and integrating learning theories and the individual learning strengths, styles and needs of students

- critically and collaboratively inquiring into the dimensions associated with creating and sustaining safe, inclusive, accepting and engaging learning environments

- critically exploring and integrating holistic and inclusive educational programs that build on learners' abilities and empower them to reach their learning goals

- critically exploring the significance of relevant legislation including the Ontario Human Rights Code, the Canadian Charter of Rights and Freedoms, Safe Schools Act, Accepting Schools Act, Ontarians with Disabilities Act, Municipal Freedom of Information and Protection of Privacy Act (MFIPPA), the Accessibility for Ontarians with Disabilities Act (AODA) and associated responsibilities of professional practice

- critically exploring teachers' legal obligations and ethical responsibilities according to current provincial legislation and practices

- critically exploring and integrating problem solving processes, methods and approaches as they relate to *Teaching Computer Technology – Networking*

- critically exploring and integrating the fundamental technological concepts associated with *Teaching Computer Technology – Networking*.

E. Program Design, Planning and Implementation

The exploration of the following guiding concepts will be facilitated through holistic and interrelated inquiry processes:

- critically exploring and deepening understanding of how the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession* can inform a program planning framework

- critically exploring the influence of society's diverse and changing nature on student learning, resiliency and well-being

- critically exploring and deepening understanding of program design, planning, development and implementation strategies and frameworks related to *Teaching Computer Technology – Networking*

- critically exploring the philosophical underpinnings that strengthen teachers' professional efficacy to support curricular and interdisciplinary integration

- critically exploring various approaches to curricular integration through diverse planning models, content and resource development, pedagogical practices and the implementation of equitable assessment and evaluation practices

- critically exploring and deepening understanding of differentiated instruction, universal design and the tiered approach in program planning, development and implementation

- critically exploring learning resources that support student learning, engagement and safety (for example, print, visual and digital)

- critically exploring the types of secondary school pathways (including apprenticeship, college, university and workplace) and their relationship to students' post-secondary goals and career opportunities

- critically exploring how students' lived experiences, development, strengths, inquiries, interests and needs can inform program planning, development and implementation

- critically exploring the integration of culturally inclusive pedagogies within program design, planning and development

- critically exploring strategies that support learners' resiliency, well-being and mental health

- critically exploring planning and instructional processes that honour students' learning styles, strengths and experiences

- facilitating shared leadership in the implementation of local and provincial guidelines and policies that support safe and effective learning environments

- critically inspecting and reporting on the learning environment, facilities, equipment needs, resources and state of maintenance and repair for delivering *Teaching Computer Technology – Networking*

- critically applying the theoretical foundations of *Teaching Computer Technology – Networking* by incorporating the broad-based pedagogical approach that embeds problem solving and fundamental technological concepts

- fostering leadership and shared responsibility for the safe, ethical and legal use of technology in *Teaching Computer Technology – Networking* programs

- critically exploring pedagogical documentation and utilizing a variety of assessment processes to inform program planning, support student learning and foster student engagement.

F. Learning Environments and Instructional Strategies

The exploration of the following guiding concepts will be facilitated through holistic and interrelated inquiry processes:

- critically exploring processes for the creation of inclusive and vibrant learning environments that reflect the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession*

- creating and sustaining positive, ethical, equitable, accepting, inclusive, engaging and safe learning environments

- critically exploring processes for engaging all members of the community, supporting dialogue and collegiality and nurturing a sense of belonging

- critically exploring processes for fostering a collaborative community of empowered and engaged learners

- fostering engaging, trusting and inviting learning environments that promote student voice, leadership, critical inquiry and self-regulation

- critically exploring a variety of instructional strategies to support student learning, resiliency and well-being

- cultivating safe, ethical, legal and respectful practices in the use of information and communication technologies to support pedagogical practices

- critically exploring inclusive and innovative learning environments that integrate a variety of instructional strategies to respond the interests and needs of all learners (for example, universal design, experiential learning, differentiated instruction, inquiry and the tiered approach)

- critically exploring processes that engage students as active, democratic and global citizens in supporting environmental, social and economic sustainability

- critically exploring the professional identity, knowledge and leadership practices of educators as described in the *Ethical Standards for the Teaching Profession*, the *Standards of Practice for the Teaching Profession*, the *Professional Learning Framework for the Teaching Profession* and the *Foundations of Professional Practice*

- fostering shared leadership and responsibility for the safe and effective management of a variety of technical learning environments

- promoting a shared commitment and responsibility towards planning, organizing and implementing effective health, safety, sanitation and environmental standards in the *Teaching Computer Technology – Networking* facility

- cultivating a culture of shared leadership and responsibility towards facility design and maintenance practices as per industry standards

- fostering a culture of collective understanding and compliance with workplace health and safety legislation and standards related to *Teaching Computer Technology – Networking*.

G. Reflecting, Documenting and Interpreting Learning

The exploration of the following guiding concepts will be facilitated through holistic and interrelated inquiry processes:

- critically exploring fair, equitable, transparent, valid and reliable assessment and evaluation methods that honour the dignity, emotional wellness and cognitive development of all students

- critically exploring feedback processes that empower and inspire students to positively reflect on and identify goals for their learning

- fostering an examination of feedback that engages students in the critical analysis and interpretation of the learning process

- critically exploring culturally inclusive processes for reflecting, documenting and interpreting learning

- critically exploring and integrating assessment, evaluation and reporting practices that align with the principles and processes of Ontario's curriculum, frameworks and policy documents

- critically exploring assessment practices for the following three purposes: to provide feedback to students and to adjust instruction (assessment for learning); to develop students' capacity to be independent, autonomous learners (assessment as learning); to make informed judgements about the quality of student learning (assessment of learning).

H. Shared Responsibility for Learning

The exploration of the following guiding concepts will be facilitated through holistic and interrelated inquiry processes:

- critically exploring a variety of effective communication and engagement strategies for authentic collaboration with parents/guardians, school/board personnel and community agencies

- fostering partnerships with parents/guardians that honour and value shared decision-making, advocacy and leadership

- critically and creatively exploring processes to encourage and honour student voice and identity in the learning process through shared decision-making and leadership

- critically exploring strategies and opportunities for professional collaboration that support student learning, resiliency, well-being and leadership

- critically exploring and openly addressing biases, discrimination and systemic barriers in order to support student learning, resiliency, well-being and inclusion

- critically exploring and analyzing positive, inclusive educational and professional cultures in which perspectives are freely-expressed and critically analyzed

- understanding and respecting the importance of shared responsibility and partnership that promote social and ecological justice as conveyed in the *Foundations of Professional Practice*

- collaboratively designing strategies for establishing links between the school community, industry and the *Teaching Computer Technology – Networking* program

- critically exploring and integrating sector-specific learning opportunities in other curriculum areas

- critically exploring professional collaboration within interdisciplinary teams to support student learning, resiliency, self-advocacy and transitions.

I. Research, Professional Learning and the Scholarship of Pedagogy

The exploration of the following guiding concepts will be facilitated through holistic and interrelated inquiry processes:

- critically exploring and reflecting on past, current and evolving practices in teaching computer technology and networking

- critically exploring professional practice through ongoing inquiry into theory and pedagogy/andragogy

- engaging in transformational professional learning through research, scholarship and leadership

- critically exploring critical pedagogy that integrates research and the scholarship of pedagogy/andragogy into teaching practice

- engaging in research and the scholarship of critical pedagogy/andragogy to advance communities of practice

- critically exploring knowledge-creation and mobilization to enhance professional practice and leadership.

6. Instructional Design and Practices in the Additional Qualification Course: Teaching Computer Technology – Networking

The instructional design and practices (Figure 5) employed in this AQ course reflect adult learning theories, effective andragogical processes and experiential learning methods that promote critical reflection, dialogue and inquiry.

Candidates collaboratively develop with course instructors the specific learning inquiries, learning experiences, holistic integration processes and forms of assessment and evaluation that will be used throughout the course.

In the implementation of this Additional Qualification course, instructors **facilitate** andragogical processes that are relevant, meaningful and practical to provide candidates with inquiry-based learning experiences related to program design, planning, instruction, pedagogy, integration and assessment and evaluation. The andragogical processes include but are not limited to: experiential learning, role-play, simulations, journal writing, self-directed projects, independent study, small group interaction, dialogue, action research, inquiry, pedagogical documentation, collaborative learning, narrative, case methodologies and critical reflective praxis.

Pedagogy

Case Methodologies

Pedagogical Documentation

Program
Planning

Dialogue
Independent Study

Processes

Experiential Learning

Critical Action Research

Narrative

Reflection

Assessment
and
Evaluation

Small group interaction

Collaborative Learning

Inquiry

Self-directed Projects

Instructional
Design and
Practices

Figure 5: Instructional Processes

Instructors **embody** the *Ethical Standards for the Teaching Profession* and the *Standards of Practice for the Teaching Profession*, honour the principles of adult learning, respect candidates' experience, recognize prior learning, integrate culturally inclusive practices and respond to individual inquiries, interests and needs. Important to the course are opportunities for candidates to create support networks, receive feedback from colleagues and instructors and share their learning with others. Opportunities for professional reading, reflection, dialogue and expression are also integral parts of the course.

Instructors **model** critical inquiry, universal design and differentiated instruction and assessment practices that can be replicated or adapted in a variety of classroom settings.

Experiential Learning

Candidates will be provided with opportunities to engage in experiential learning related to key concepts and aspects of *Teaching Computer Technology – Networking* as collaboratively determined by both the instructor and course candidates. The intent of the experiential learning opportunities is to support the application and integration of practice and theory within the authentic context of teaching and learning. Candidates will also engage in critical reflection and analysis of their engagement in experiential learning opportunities and inquiries related to *Teaching Computer Technology – Networking*. The professional judgment, knowledge, skills, efficacy and pedagogical practices of candidates will be enhanced and refined through experiential learning and critical inquiry.

The College's standards-based resources help to support experiential learning through various professional inquiry processes. These can be found at: http://www.oct.ca/resources/categories/professional-standards-and-designation

7. Assessment and Evaluation of Candidates

At the beginning of the course, candidates will collaboratively develop with course instructors the specific learning inquiries, learning experiences and forms of assessment and evaluation that will be used throughout the course. Instructors will provide opportunities for regular and meaningful feedback regarding candidates' progress throughout the course.

A balanced approach to candidate assessment and evaluation is used. It includes the combination of self, peer and mutual (instructor and candidate) assessment, as well as instructor evaluation. The assessment and evaluation strategies reflect effective, collaborative and inquiry-based practices. A variety of assessment approaches will be used that enable candidates to convey their learning related to course inquiries. The course provides opportunities for both formative and summative assessment and evaluation.

Central to candidates enrolled in Additional Qualification courses is the opportunity to be engaged in relevant and meaningful inquiries. Assignments, artefacts and projects enable candidates to make connections between theory and practice. At the same time, assignments also allow candidates flexibility, choice and the opportunity to design individual inquiry opportunities.

Learning processes support an in-depth exploration of concepts and inquiries. These processes occur over the duration of the course and are reflective of critical thinking and reflection as the candidate gains knowledge and skills over the duration of the course.

The evaluation practices will also support significant and in-depth critical inquiries utilizing a variety of processes over the duration of the course. These inquiry-based assessment processes provide opportunities for candidates to illustrate a depth of professional knowledge, skills, pedagogies, ethical practices and instructional leadership.

A final culminating experience in the course is recommended. This synthesis experience will reflect the in-depth knowledge and understanding gained as a result of engagement in this AQ. It will also include critical reflections and an analysis of a candidate's learning over time.

The following processes are provided to guide assessment practices within this AQ course and are reflective of experiential learning, critical pedagogies and safe and inclusive practices. This list is not exhaustive.

a) **Pedagogical Leadership**: co-constructing, designing and critically assessing culturally inclusive learning opportunities that integrate student voice, strengths, interests and needs. The learning opportunities will incorporate a variety of technologies and resources and are reflective of Ministry of Education curriculum	h) **Innovative Learning Experience**: designing and facilitating an engaging, innovative learning experience that reflects differentiated instruction, universal design and the tiered approach
b) **Pedagogical Portfolio**: creating a professional portfolio that critically analyzes teaching and learning philosophies, assumptions, practices and pedagogies designed to inform ethical and democratic learning environments	i) **IEP Development**: collaboratively developing an IEP with the family, student and school team
	j) **Partnership Plan**: designing a comprehensive plan that engages students, families and the school and local communities in collaborative partnerships that support student learning, growth, resiliency and well-being

c) **Pedagogical Documentation**: assembling visible records (for example, written notes, photos, videos, audio recordings, artefacts and records of students' learning) that enable teachers, parents and students to discuss, interpret and reflect upon the learning process

d) **Critical Action Research**: engaging in individual and/or collaborative action research that is informed by the critical exploration of various action research approaches

e) **Case Inquiry**: critically reflecting on and inquiring into professional practice through case writing and/or case discussion

f) **Transition Plan**: critically reflecting on and analyzing a student transition plan and generating recommendations for enhancement

g) **Narrative Inquiry**: collaboratively and critically analyzing narratives of teaching and learning through a number of lenses (for example, professional identity, professional efficacy, ethical leadership and critical pedagogies) utilizing the processes of narrative writing and/or narrative discussion

k) **Critical Reflection**: critically analyzing educational issues associated with this AQ utilizing scholarly research through multiple representations (for example, narratives, written documentation and images or graphics)

l) **Visual Narrative**: creating a visual narrative (for example, digital story) that helps to support the collective professional identity of the teaching profession and advances professional knowledge and pedagogy

m) Critical analysis of safety policies, protocols and practices within technological education contexts (for example, classroom, school and district level).

8. Demonstrated Knowledge and Skill in Teaching Computer Technology – Networking

Successful candidates will be able to demonstrate technical knowledge and skill in the following:

Knowledge/Fundamentals/Foundations

Computer Technology Fundamentals

- use of the fundamental technological concepts (for example, aesthetics, control, environmental sustainability, ergonomics, fabrication/building/ creation, function, innovation, material, mechanism, power and energy, safety, structure and systems) to inform the design and production of computer technology

- describing the function of data transmission and routing protocols (for example, internet protocol [IP], Internetwork Packet Exchange [IPX], Routing Information Protocol [RIP], Open Shortest Path First [OSPF] and Enhanced Interior Gateway Routing Protocol [EIGRP])

- understanding Open Systems Interconnection [OSI] model (for example, benefits/purpose of using a layered model, input, encapsulation, output and Protocol data unit [PDU] of each of the seven layers, de-encapsulation process, relation to Transmission Control Protocol/Internet Protocol [TCP/IP] model)

- design, installation and configuration of a peer-to-peer network (for example, choosing the appropriate media and rationale, understanding media access methods such as Carrier Sense Multiple Access With Collision Detection [CSMA/CD], Carrier Sense Multiple Access With Collision Avoidance [CSMA/CA] and token ring, logical versus physical network topology, choosing appropriate local area network (LAN) devices and rationale, determining number and size of subnets [accommodating for network growth] and assigning a network addressing scheme that minimizes address waste)

- applying logical troubleshooting techniques (for example, troubleshooting using Open Systems Interconnection [OSI] model or Transmission Control Protocol/Internet Protocol [TCP/IP] model as the reference model for diagnosis [top down, bottom up, divide and conquer, substitution]).

Numeracy

- comparing binary and hex representation and numbers (for example, decimal, binary and hex number conversion)

- relating Boolean algebra to logic gates, using symbolic, algebraic and numeric representation (include 'AND'ing of Internet Protocol [IP] address and subnet mask)

- describing how computers store and work with different numbers/characters (for example, including binary and decimal representation of Internet Protocol [IP]addresses, logical 'AND'ing of Internet Protocol [IP]address and subnet mask to determine network and host portions)

- describing IP addressing and subnetting (for example, determining a custom subnet mask from a default subnet mask based on required subnets or required hosts, assigning subnet addressing in a multi local area network [LAN] and wide area network [WAN] scenario and subnetting using variable-length subnet masks [VLSM])

- describing static and dynamic public and private addressing (for example, class and classless assignment of IP addresses and subnet masks, network address translation [NAT], port address translation [PAT] and Dynamic Host Configuration Protocol [DHCP])

- in-depth knowledge of computer units of measurement based on user/system needs (for example, 2.8 GHz, 3mbs/sec, 512 MB and 1280x1960).

Literacy

- understanding and using appropriate networking terminology and acronyms

- critically exploring the educational uses of emerging and evolving mobile devices, personal computers and computer servers

- critically exploring the features and use of common operating systems (for example, Microsoft Windows, OS X and Linux).

Skills/Proficiencies

Hardware Skills

- design, installation and configuration of a peer-to-peer network (for example, using home-based and enterprise routers with a focus on understanding enterprise router port interfaces such as Fast Ethernet, Serial, Auxiliary and Console)

- construction of straight-through, crossover and rollover cables (for example, T568A and T568B pinouts, recognition of console cable and serial Winchester cable such as data circuit-terminating equipment/data terminal equipment [DCE/DTE] connections).

Software Skills

- design, installation and configuration of a peer-to-peer network (for example, software configuration of peer-peer and client server networks [with hubs and/or switches] using home-based [graphical user interface] and enterprise [command-line interface] routers and configuration of enterprise routers via terminal emulation such as HyperTerminal)

- implementing various network services for users (for example, Telnet, web, domain name system [DNS], Dynamic Host Configuration Protocol [DHCP] and File Transfer Protocol [FTP] servers)

- command line utilities to test network functionality (for example, ping, tracert, ipconfig, netstat and nslookup)

- structured network troubleshooting processes (for example, using data from simulation and/or diagnostic tools such as WireShark)

- understanding the function, operation and relevance of software device drivers.

Professional Practices and Safety

- industrial health and safety practices

- the use of appropriate techniques to avoid health and safety problems (for example, knowledge of residual power capacitance in electronics after removal of power supply and understanding the implications of static electricity on electrical equipment)

- essential skills, per the Ontario Skills Passport (for example, understanding the need for time management skills and balance)

- lifelong learning (for example, understanding that self-directed lifelong learning is necessary, particularly in information technology)
- work habits, per the Ontario Skills Passport (for example, understanding the importance of team project collaboration and responsible delegation of work tasks).

Ethics and Security

- the drawbacks of computer technology and electronics on society (for example, distinguishing internal and external networking threats, understanding threat types such as social engineering, phishing, vishing, worms, Trojans, viruses, pretexting, denial of service, brute force and spyware)
- methods to safeguard confidential or sensitive information (for example, company security policies, including authentication, encryption, firewalls and anti-virus software)
- understanding of acceptable use policies (for example, ethical use of the Internet and social media sites and impact of inappropriate use)
- critically exploring the ethical and legal use of Open Source and commercial software applications.

Environment & Society

- effects of computer systems on the environment (for example, appropriate disposal methods for electronics and the impact on the environment, environmental impacts on the increase of radio frequency [RF] in our society and in our households)
- identification of community partners and/or government agencies lending to reduce/reuse/recycle.

Appendix 1

The Ethical Standards for the Teaching Profession

The *Ethical Standards for the Teaching Profession* represent a vision of professional practice. At the heart of a strong and effective teaching profession is a commitment to students and their learning. Members of the Ontario College of Teachers, in their position of trust, demonstrate responsibility in their relationships with students, parents, guardians, families, colleagues, educational partners, other professionals, the environment and the public.

The Purposes of the Ethical Standards for the Teaching Profession are:

- to inspire members to reflect and uphold the honour and dignity of the teaching profession
- to identify the ethical responsibilities and commitments in the teaching profession
- to guide ethical decisions and actions in the teaching profession
- to promote public trust and confidence in the teaching profession.

The Ethical Standards for the Teaching Profession are:

Care
The ethical standard of *Care* includes compassion, acceptance, interest and insight for developing students' potential. Members express their commitment to students' well-being and learning through positive influence, professional judgment and empathy in practice.

Respect
Intrinsic to the ethical standard of *Respect* are trust and fair-mindeness. Members honour human dignity, emotional wellness and cognitive development. In their professional practice, they model respect for spiritual and cultural values, social justice, confidentiality, freedom, democracy and the environment.

Trust
The ethical standard of *Trust* embodies fairness, openness and honesty. Members' professional relationships with students, colleagues, parents, guardians, families and the public are based on trust.

Integrity
Honesty, reliability and moral action are embodied in the ethical standard of *Integrity*. Continual reflection assists members in exercising integrity in their professional commitments and responsibilities.

The Standards of Practice for the Teaching Profession

The *Standards of Practice for the Teaching Profession* provide a framework of principles that describes the knowledge, skills and values inherent in Ontario's teaching profession. These standards articulate the goals and aspirations of the profession. These standards convey a collective vision of professionalism that guides the daily practices of members of the Ontario College of Teachers.

The Purposes of the Standards of Practice for the Teaching Profession are:

- to inspire a shared vision for the teaching profession
- to identify the values, knowledge and skills that are distinctive to the teaching profession
- to guide the professional judgment and actions of the teaching profession
- to promote a common language that fosters an understanding of what it means to be a member of the teaching profession.

The Standards of Practice for the Teaching Profession are:

Commitment to Students and Student Learning
Members are dedicated in their care and commitment to students. They treat students equitably and with respect and are sensitive to factors that influence individual student learning. Members facilitate the development of students as contributing citizens of Canadian society.

Professional Knowledge
Members strive to be current in their professional knowledge and recognize its relationship to practice. They understand and reflect on student development, learning theory, pedagogy, curriculum, ethics, educational research and related policies and legislation to inform professional judgment in practice.

Professional Practice
Members apply professional knowledge and experience to promote student learning. They use appropriate pedagogy, assessment and evaluation, resources and technology in planning for and responding to the needs of individual students and learning communities. Members refine their professional practice through ongoing inquiry, dialogue and reflection.

Leadership in Learning Communities
Members promote and participate in the creation of collaborative, safe and supportive learning communities. They recognize their shared responsibilities and their leadership roles in order to facilitate student success. Members maintain and uphold the principles of the ethical standards in these learning communities.

Ongoing Professional Learning
Members recognize that a commitment to ongoing professional learning is integral to effective practice and to student learning. Professional practice and self-directed learning are informed by experience, research, collaboration and knowledge.