



Additional Qualification Course Guideline Honour Specialist Mathematics

Schedule E – Teachers' Qualifications Regulation

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Preface

Additional Qualification (AQ) course guidelines are designed following extensive consultation and feedback from course providers, course writers and members of the teaching profession.

AQ course guidelines serve as the framework for providers and instructors to develop courses.

AQ course guidelines are organized in the following two sections:

Section A: Additional Qualification Course Foundations

This section outlines the fundamental contexts that are embedded in the content of the AQ course. Education in Ontario embodies these to support educator and learner well-being. These fundamental contexts are essential to foster safe, welcoming and inclusive learning environments for all learners and educators.

Section B: Additional Qualification Course Design

This section identifies the core concepts and related elements that are accreditation requirements for all AQ courses. This section also outlines specific content that allows educators to gain in-depth knowledge and skills related to the AQ course.

In this document, all references to candidates are to educators enrolled in the AQ course. References to learners indicate those enrolled in school programs.

Introduction

The Ontario College of Teachers (the College) is the self-regulating body for the teaching profession in Ontario and is responsible for:

- establishing and enforcing professional standards and ethical standards applicable to members of the College
- providing for the ongoing education of members of the College
- accrediting Additional Qualification (AQ) courses.

The College supports teaching excellence by preparing educators to work in varied and diverse educational contexts and geographical settings:

- English language public school
- French language public school
- English language Catholic school
- French language Catholic school
- First Nations school
- Provincial and Demonstration school
- Private school
- Independent school
- Urban setting
- Rural setting
- Remote setting.

This AQ course guideline provides a framework upon which to develop courses that meet accreditation requirements established in Regulation.

Section A: Additional Qualification Course Foundations

Placing each student's interests and well-being first is at the core of teaching in Ontario.

Professional Learning in Ontario

Professional learning is an integral part of the teaching profession. Educators participate in ongoing professional learning with the goal of improving outcomes for Ontario learners.

Educators complete a four-semester, pre-service teacher education program to become qualified to teach in Ontario. Throughout their career, they continue to engage in professional learning offered in various formats such as sessions offered by Ministry of Education, School Board or community partners, professional reading and Additional Qualification (AQ) courses.

The AQ Course *Honour Specialist Mathematics* reflects **adult learning theories and processes** that foster critical reflection, dialogue and inquiry. Instructors provide candidates with professional learning experiences related to teaching, learning and assessment of learners.

AQ courses are designed by educators to inform and enhance professional practice. These courses allow educators to deepen their knowledge and skills in design and delivery of specific programs. They also support professional practice by preparing educators for specific roles within the educational community.

Professional Learning Framework for the Teaching Profession

The *Professional Learning Framework for the Teaching Profession* describes opportunities and processes that support ongoing professional learning for educators. AQ courses offer an opportunity for educators to inform and advance their professional knowledge, skills, practices and values.

Ethical Standards for the Teaching Profession



Standards of Practice for the Teaching Profession



Standards based resources can be found on the [College web site](#).

Ontario's Learning Context

Ontario educators recognize that learning is influenced by the individual student's strengths, needs, interests, lived experiences and identities. Education in Ontario is complex and dynamic. Ontario's schools are learning communities that reflect the province's diversity. The *Ontario Human Rights Code* and the *Education Act* serve as the foundation for equitable, inclusive and accessible education.

The teaching profession in Ontario continues to evolve in response to the current and everchanging diversity of learners. Thus, educators are called upon to follow foundational principles that inform instructional practice. Through ongoing professional learning, educators deepen their understanding of the principles outlined below. In so doing, Ontario educators enhance their professional practice to support each student's learning and well-being.

Anti-Oppression Foundation

An anti-oppression foundation is an approach that supports ensuring that equity and human rights are foundational to all Additional Qualification (AQ) courses and programs available to Ontario educators. An anti-oppression foundation acknowledges that systemic manifestations of power and privilege have led to multiple forms of oppression, injustices, inequities and inequalities. Ongoing teacher education must recognize and address historical contexts which have contributed to various forms of oppression. An anti-oppression foundation recognizes that educator and student learning and well-being are impacted by biases and assumptions related to power and privilege. Educators have a shared ethical and professional responsibility to identify and challenge individual and systemic barriers to support the learning, well-being and inclusion of each learner.

First Nation, Métis, and Inuit Histories, Cultures, Perspectives, and Knowledge Systems in Education

Ontario's educators are responsible to uphold the *Truth and Reconciliation Commission of Canada: Calls to Action* and align their professional practice with the *United Nations Declaration on the Rights of Indigenous Peoples* (UNDRIP). They engage in authentic reconciliatory action by learning from and valuing First Nations, Métis, and Inuit histories, perspectives and knowledge systems, in teaching and learning. Educators, as treaty partners, acknowledge learning about, and upholding treaty responsibilities will guide them on the reconciliation journey.

Aménagement Linguistique Policy (PAL)

Section 23 of the Canadian Charter of Rights and Freedoms guarantees the French or English linguistic minority populations of a province the right to instruction in their own language.

In Ontario, the *Aménagement Linguistique Policy* (PAL) outlines the unique mandate of French-Language schools. Educators act as ambassadors and model the French language and francophone culture for learners. Educators deepen their understanding of learners' linguistic and cultural francophone identity. They collectively develop a provincial, national and international sense of belonging to *la Francophonie*.

Learning for All

Educators believe that each student can learn. Educators provide programs and services that respond to each learner's unique strengths and needs. Evidence-based teaching and learning practices that are learner-centred provide equitable opportunities for all. Inclusive learning environments respect the identities of each learner and support their cognitive, social, emotional and physical development.

Accessibility for All

Accessibility for all is informed by the *Ontario Human Rights Code* and the *Accessibility of Ontarians with Disabilities Act, 2005*. Accessibility, inclusion and equity are fundamental to everyday practice for teaching and learning. Educators advocate for each learner to access and benefit from services and resources within the education system, understanding the unique needs presented by geographical and socioeconomic contexts. Educators design opportunities for each learner to showcase their abilities and fully participate in their learning. The implementation of adaptive strategies, such as assistive technology, accessible content and inclusive design for teaching and learning respects the strengths and needs of each learner.

Special Education

Each learner has their own unique profile. Under the *Education Act*, a learner may be identified by an Identification, Placement and Review Committee (IPRC) as having behavioural, communicational, intellectual, physical or multiple exceptionalities. An Individual Education Plan (IEP) must be developed by an interdisciplinary team to reflect the learner's strengths, needs, and abilities, according to Reg. 181/98. As educators are responsible for instruction, assessment and evaluation of all learners, they provide accommodations, modifications, or alternative programming outlined in the IEP.

Accreditation – Program of Additional Qualification

Accreditation requirements for Additional Qualification (AQ) courses are articulated in O. Reg. 347/02: *Accreditation of Teacher Education Programs*, s. 24.

A program of additional qualification may be granted accreditation under this Regulation if the following requirements are satisfied:

1. 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.
2. The program satisfies the requirements of the teachers' qualifications regulation for entry of an additional qualification on the general certificate of qualification and registration of a person who successfully completes the program.
3. The program curriculum is current, references the Ontario curriculum, relevant legislation and government policies and represents a wide knowledge base in the program's area of study.
4. The course content of the program makes appropriate provision for the application of theory in practice.
5. The program's format and structure are appropriate for the course content of the program.
 - 5.1 The program consists of a minimum of 125 hours of work acceptable to the Registrar.
6. There is clear identification of the goals of the program, with a formal testing or assessment mechanism to determine the level of successful completion of the program.
7. The majority of the educators teaching the program have Ontario teaching experience relevant to the program.
8. The provider maintains adequate internal controls to preserve the integrity of student records relating to the program.
9. The provider is committed to continuous improvement and quality assurance of the program and, if the program is an existing program, has implemented measures demonstrating that commitment.

O. Reg. 347/02, s. 24; 2009, c. 33, Sched. 13, s. 3 (2); O. Reg. 182/10, s. 8.

Section B: Additional Qualification Course Design

Additional Qualifications (AQs) for educators are identified in O. Reg. 176/10: *Teachers' Qualifications Regulation*. This regulation includes courses that lead to AQs, the Principal's Development Qualification, the Principal's Qualifications, the Primary Division, the Junior Division, the Intermediate Division, the Senior Division, the Supervisory Officer's Development Qualification and the Supervisory Officer's Qualifications. A session of a course leading to an AQ shall consist of a minimum of 125 hours as approved by the Registrar. Successful completion of the course is recorded on the candidate's Certificate of Qualification and Registration.

Honour Specialist Additional Qualification – Schedule E (Single Session)

Schedule E (see Appendix 1) *Honour Specialist Mathematics* allows educators with post-secondary studies in mathematics to:

- apply knowledge and skills in a leadership role
- develop the capacity for curriculum leadership.

Additional Qualification Course Requirements

The AQ course *Honour Specialist Mathematics* enables candidates to advance their professional practice through focussed learning in the following areas:

- Curriculum Knowledge
- Pedagogical Strategies
- The Learning Environment.

This AQ course is designed and delivered using adult learning instructional practices.

The purpose of this AQ is to support educators in the development of knowledge, skills and practices related to the teaching of mathematics. The course enables educators to explore mathematics through an anti-oppression foundation that honours learner identities. Educators will explore mathematical concepts and progressions of learning and apply pedagogies that promote learner skills and curiosities in an inclusive environment.

Honour Specialist Mathematics applies the subject-specific professional practice, knowledge and skills in a leadership role in the following required elements:

Anti-Oppression Foundation

- theories and pedagogies about multiple forms of oppression applied to the design, assessment and implementation of programs and practices
- addressing individual and systemic biases, discrimination and barriers as well as manifestations of power and privilege
- addressing disproportionate representation of learners from equity seeking groups within specialized programs
- pedagogy to counter oppression in mathematics (for example, checking educator bias, triangulation of assessment and valuing different abilities in mathematics)
- bias-aware practices to explore financial literacy to promote equity and inclusion.

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

- significance of the Ethical Standards and the Standards of Practice as theoretical foundations within *Mathematics*
- ethical professional identity, knowledge, leadership, advocacy and collective practices to inform program planning.

First Nations, Métis, and Inuit histories, perspectives and knowledge systems

- meaningful inclusion of First Nations, Métis, and Inuit histories, perspectives and knowledge systems in teaching and learning mathematics
- knowledge of the *Truth and Reconciliation Commission of Canada: Calls to Action* (TRC)
- awareness of *United Nations Declaration on the Rights of Indigenous Peoples* (UNDRIP).

Current Ontario curriculum and related Ministry of Education policies, frameworks, guidelines, strategies and resources

- Ontario curriculum, policies, frameworks, strategies and resources related to *Mathematics*
- policies, processes and practices that foster openness to innovation, culturally inclusive pedagogies and the democratization of knowledge.

Current Ontario legislation and regulation

- relevant legislation (for example, *Ontario Human Rights Code*, *Anti-Racism Act*, 2017, S.O. 2017, c. 15 and *Freedom of Information and Protection of Privacy Act*) and policies at the municipal, provincial, federal and international levels that support human rights and privacy for all
- candidates' legal obligations and ethical responsibilities according to current provincial legislation, policies and practices.

Learning for All

- processes and program planning that provide equitable opportunities for each learner (for example, differentiated instruction and assessment and strategies for flexible groupings)
- practices that respond to the strengths, identities, needs and interests of each learner (for example, universal learning design, collaborative and experiential learning and oral language strategies)
- practices that respond to learner's curiosities and experiences to empower them to reach their learning goals (for example, engaging educators in math conversations)
- practices to know learners and intentionally implement accommodations to support them (for example, oral and visual cues and written instructions)
- intentional selection and design of mathematics learning experiences that allow learners to have multiple entry points along the continuum of learning (for example, moving from patterns to algebraic expressions and open and parallel tasks)
- early and ongoing intervention approaches for the elementary and secondary panel (for example, attendance patterns, reading assessments).

Accessibility for All

- ethical responsibilities related to the *Ontario Human Rights Code* and *Accessibility for Ontarians with Disabilities Act* S.O., 2005
- advocacy for resources and services that respond to the cognitive, social, emotional, physical and contextual needs of each learner
- adaptive strategies, assistive supports and technologies to facilitate mathematics learning and foster inclusion
- strategies to address ableism that exists in processes and practices
- strategies to address visible and invisible barriers in mathematics.

Special Education

- legal and ethical responsibilities related to learner's Individual Education Plan (IEP), safety plan and transition plan
- programs, strategies and services that support the identified learner in achieving individual mathematics learning goals outlined in their respective plans
- interdisciplinary teams to support learning, advocacy and transitions
- exploration of low-tech (for example, manipulatives) or mid-tech (for example, a calculator) supports before implementing high-tech supports (for example, assistive devices), using data and research to inform decisions when teaching mathematics
- knowledge of different exceptionalities and their impact on learning mathematics (for example, executive function, memory processing and spatial reasoning).

Educational research

- current research and literature associated with professional practices, policies and pedagogies related to *Mathematics*, including Ministry of Education resources (for example, *High-Impact Instructional Practices in Mathematics*)
- research that reflects society's diverse changing nature and influence on learning and well-being
- theoretical foundation for the design, assessment and implementation of programs and practices in support of mathematical learning
- research that explores mathematical concepts across the curriculum (for example, learning trajectories and development of mathematics content knowledge for teaching).

Application of theories of learning and teaching

- theories and practices related to pedagogy and andragogy that support learning within an inclusive environment
- theoretical frameworks and fundamental principles underpinning *Mathematics*
- theories of development and identity formation that support learner well-being, efficacy and agency
- learning theories to develop learner's profiles and identities.

Supports for learners

- policies, processes, practices to support learners cognitive, social, emotional and physical development in the mathematics learning environment
- programs that respond to learners' lived experiences, identities, needs and well-being
- practices that respond to linguistic abilities of learners (for example, building mathematics vocabulary, math journaling)
- critical pedagogies and practices that support learners' well-being and efficacy (for example, challenging stereotypes in mathematics).

Teaching, assessing and evaluating

- program design and implementation that align with the principles and processes of Ontario curriculum and related policies, including their embedded teacher supports and resources
- culturally inclusive processes and practices to provide learning opportunities that respect the learning styles, voices and perspectives of each learner
- assessment and evaluation processes and practices that apply observations, conversations and products to:
 - provide feedback to learners and adjust instruction (assessment *for* learning)
 - develop learners' capacity to be independent, autonomous learners (assessment *as* learning)
 - make informed professional judgments about the quality of learning (assessment *of* learning)
- instructional strategies to emphasize the importance of inquiry-based learning and transferable skills
- practices to support the development of horizon content knowledge for teaching mathematics
- research-informed mathematics learning progressions.

Pathway and transition planning

- processes and practices to support all transitions
- curriculum design using learners' career and life goals
- programs and learning opportunities for all pathways
- practices that develop foundational mathematics skills and the transferable skills to support lifelong learning at home, school and beyond
- advocacy for mathematics as an entry point to all pathways in traditional and non-traditional careers.

Safe, equitable and inclusive learning environments

- policies, processes and practices to create and maintain inclusive learning environments that respect diversity and encourage critical thinking (for example, gender neutral language and resources in various formats, co-construction of classroom norms for participating in mathematics conversations and collaborative activities)
- inclusive learning environments that facilitate learning, foster learner agency and perspectives
- practices that support safe and healthy learning environments for learners as well as families, caregivers, guardians, Elders, Knowledge Keepers and Knowledge Guardians
- strategies to acknowledge and respond to biases that impact learner achievement and well-being (for example, anti-oppressive approach to data literacy analysis)
- critical analysis of social-emotional learning as part of mathematics instruction but not part of assessment
- advocacy for equitable access to technology and learning materials.

Teaching and learning through e-Learning principles

- critical analysis of digital tools when considering integration of information and communication technology to enhance teaching and learning (for example, examining board vetting protocols)
- technological and communication resources to enhance professional knowledge in support of learning and agency
- ethical use of technology in support of learners' safety, privacy and well-being (for example, analysis of the use and misuse of artificial intelligence).

Culturally responsive and relevant pedagogical practices

- culturally responsive and relevant practices that reflect understanding of learners' diverse identities and experiences to refine their mathematical knowledge and skills
- culturally inclusive resources that support learning to foster engagement and well-being
- strategies for exploring the difference between cultural appropriation and cultural appreciation
- practices that value mathematics knowledge, application and contributions from all cultures.

Social justice and democratic citizenship

- policies related to democratic citizenship within local, national and global contexts
- processes and practices that foster learners' voice and choice, respect diversity and promote social justice
- strategies for consensus-building, participatory democracy and empowerment within schools and the community
- awareness that mathematics can be used as a tool for critical analysis of social justice issues.

Environmental sustainability

- shared responsibility and partnership to foster ecological justice
- integration of environmentally sustainable policies, pedagogies and practices (for example, land-based pedagogy)
- processes that engage learners as active global citizens in supporting environmental and economic sustainability (for example, fostering outdoor learning by making connections between mathematics and the environment)
- strategies that integrate mathematics across the curriculum to promote environmental sustainability practices.

Shared responsibility for learning

- processes and practices to foster communication and collaboration with learners, families, caregivers, guardians, Elders, Knowledge Keepers and Knowledge Guardians, agencies and the school community to support learning mathematics at home and at school
- partnerships with families, caregivers, guardians, Elders, Knowledge Keepers and Knowledge Guardians that value shared decision-making, confidentiality, advocacy and leadership.

Communities of professional learning

- professional learning communities that promote collaboration, critical pedagogy and collective efficacy of mathematics educators
- research and leadership to advance professional practice in mathematics through ongoing collaborative inquiry, dialogue and innovation, including professional organizations (for example, Ontario Association of Mathematics Education [OAME] and Association Francophone pour l'Enseignement des Mathématiques en Ontario [AFEMO])
- internal and external collaboration and supports to enhance professional practices in mathematics, including cross-curricular teams, mentors, subject-associations and digital communities.

Resources

Resources to support the development of the AQ Course *Honour Specialist Mathematics* can be found on the [College](#) website and the [Ontario Ministry of Education](#) website.

Appendix 1

Schedule E Additional Qualification (AQ) Course – Leadership Components

Leading and Researching

- How do candidates become leaders in the subject area? - Develop leadership skills
- Candidate driven supported by instructor,
- Candidates develop learning goals to bring their knowledge to others
- Analyze pertinent legislation and policies and measure impact at school and system level
- Lead change related to curriculum and policy implementation
- Lead innovation in teaching and learning in the learning context (for example, investigate Standards of Practice, parent/guardian and community engagement strategies, learner identity)
- Develop leadership strategies to further research, theories and frameworks related to subject matter
- Apply leadership strategies and subject content research to lead instructional practice.



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