

Western Education

Transforming Education. Transforming Lives.

EDUC 5180K

Teaching & Learning Mathematics (Primary/Junior)

Instructor:

J. Penny Gordon (she/her)

(Sections 002-004 P/J)

E: jhall27@uwo.ca

Office Hours: by appointment

Schedule:

Section 002: Tuesday 3:30-6:30pm Room: 2051

Section 003: Wednesday 8:30-11:30am Room: 2051

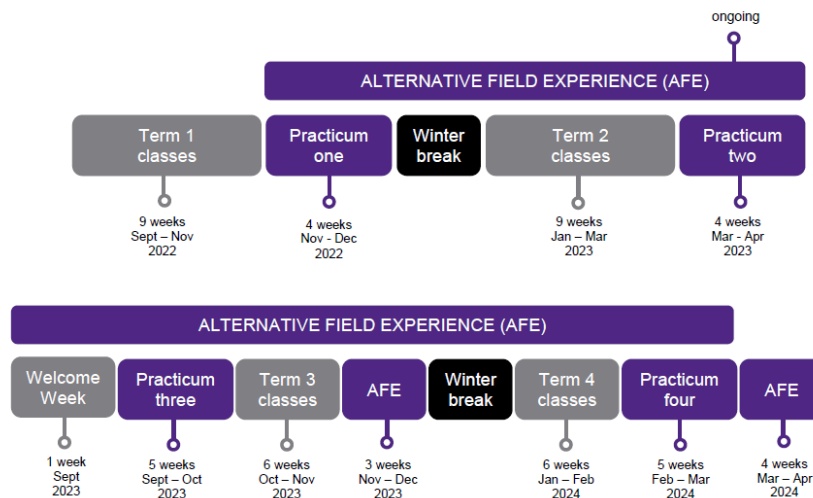
Section 004: Wednesday 3:30-6:30pm Room 2051

Program Context:

This is a **Curriculum Course** taken by Teacher Candidates in **P/J** during **Year 1, Full Year** of the Bachelor of Education.

Bachelor of Education

Program Overview – Class of 2024



Teaching & Learning Mathematics (Primary/Junior) (EDUC 5180K-PJ)

Course Description:

Strategies for the teaching and learning of mathematics in elementary school grades with particular attention to the Ontario Mathematics Curriculum, Grades 1-8. Methodologies and materials specific to selected topics are highlighted with emphasis on contemporary reform mathematics pedagogies, including the integration of computational thinking. 3 hours per week, full year .75 credit

This course will focus on introducing the teacher candidates to:

- research and theory of mathematics education
- the mathematics curriculum for the primary and junior grades, including content, processes, and social-emotional learning skills
- mathematics pedagogy and classroom practice including communication, teaching through problem solving, computational thinking, and teaching through student work
- creating rich and integrative mathematics contexts to engage students
- application of Growth Mindset in the Mathematics classroom
- creating an equitable, diverse, inclusive, and culturally responsive Mathematics classroom
- differentiated instruction, assessment, and Universal Design for Learning
- technology to enhance student learning, including computer code
- resources for lesson and unit planning and professional, life-long learning

Required Course Text:

Understanding MATH + Coding + Making, 1-8: Teacher Licence at <https://learnx.ca/math/> \$29

Course Credits:

0.75

Number of Weeks: 18

Week 1:

Welcome To Loving Mathematics!

Being Mathematicians! Equity in the Study of Mathematics
Teaching Mathematics in Ontario
Strand A Social-Emotional Learning Skills
3-Part Lesson and High Impact Instructional Strategies
Coding in the Classroom
Padlet
Mathematics Inventory

Learning Activities

Type	Name	Description
Assignment	Week 1 Online Sharing Curriculum	
	Scavenger Hunt Part 1	
Reading	Week 1 Materials & Readings	1. Gadanidis, G. (2012). Why can't I be a mathematician? https://imaginethis.ca/wp-content/uploads/2021/06/mathematician-2012- Gadanidis.pdf
		2. Ontario Mathematics Curriculum: https://www.dcp.edu.gov.on.ca/en/curriculum/elementary-mathematics

Week 2: Number

Diverse Mathematicians and Members of the STEM Community
 Ontario Mathematics Curriculum - 6 Strands Including Strand A Math Processes
 Strand A SEL Skills and Growth Mindset
 Strand B Number
 Introduction to Math Manipulatives and Concrete Models - Differentiation
 Collaborative Learning in the Math Classroom
 5 Affordances of Coding - Differentiation, Including Social Justice Applications
 Scratch Jr
 Gallery Walk
 Self and Peer Assessment and Mathematics Inventory

Learning Activities

Type	Name	Description
		1. Ontario Mathematics Curriculum: https://www.dcp.edu.gov.on.ca/en/curriculum/elementary-mathematics
Reading	Week 2 Materials & Readings	2. The Affordances of Coding: https://imaginethis.ca/educating-young-mathematicians-3-five-as-for-coding-math/ 3. Scratch Jr. App
Assignment	Week 2 Online Discussion	
Assignment	Week 2 Curriculum Scavenger Hunt - Part 2	

Week 3: Number

Strand A SEL Skills and Growth Mindset
 Strand B Number
 Operational Sense
 How to Plan a 3-Part Lesson
 Scratch Exploration
 CRA - Differentiation
 Music and Math -Differentiation and Cultural Influence

Learning Activities

Type	Name	Description
Assignment	Week 3 Online Sharing	1. eworkshop.on.ca/edu/core.cfm
Reading	Week 3 Materials & Readings	2. Ontario Math Curriculum - 47 to 49 https://www.dcp.edu.gov.on.ca/en/curriculum/elementary-mathematics 3. https://www.dcp.edu.gov.on.ca/en/program-planning/considerations-for-program-planning/human-rights-equity-and-inclusive-education 4. scratch.mit.edu

Week 4: Number and Algebra

SEL Skills and Coding with Scratch
Strand B Number
Mental Math
Math Talks
Number Talks
Math and Picture Books - Cultural Influence in Math
Repeating Patterns - Algebra

Learning Activities

Type	Name	Description
		1. scratch.mit.edu
Reading	Week 4 Materials & Readings	2. Ontario Math Curriculum: https://www.dcp.edu.gov.on.ca/en/curriculum/elementary-mathematics 3. http://mkn-rcm.ca/repeating-patterns/
Assignment	Week 4 Self-Assessment and Goal Setting- Class and On-line Participation	

Week 5: Number, Algebra, and Financial Literacy

Strand B Number and Strand F Financial Literacy
Developing Standard and Alternative Algorithms - Differentiation
Number Talks
Teaching Through Problem-Solving – Culturally Relevant and Responsive Pedagogy
Strand C Algebra
Growing and Repeating Patterns
Anticipating Student Responses
Coding
Math Congress

Learning Activities

Type	Name	Description
		1. https://learnx.ca/growing-patterns/
Reading	Week 5 Materials & Readings	2. https://ontariomath.support/?pg=results&type=subject&lang=EN&subject=FinLit
Assignment	Week 5 Online Sharing	

Week 6: Algebra

CRA
Role of the Teacher in the 3-Part Lesson
Teaching About Problem-solving - UDL
Strand C Algebra
Multiple Representations to Foster Algebraic Thinking – UDL
Continuum of Algebraic Reasoning and Representations - UDL
Repeating and Growing Patterns and Algebraic Reasoning

Learning Activities

Type	Name	Description
Reading	Week 6 Materials & Readings	1. Paying Attention to Algebraic Reasoning

Week 7: Number, Algebra, and Financial Literacy

Focus on Differentiated Instruction and Assessment - Cultural Considerations
Number Talks
Growth Mindset in the Math Classroom
Coding-Social Justice and Cultural Considerations

Learning Activities

Type	Name	Description
Reading	Week 7 Materials & Readings	1. Good Questions: Great Ways to Differentiate Mathematics Instruction, Marian Small 2. Mindset Mathematics: Visualizing and Investigating Big Ideas. Boaler, Munson & Williams 3. MaththatMatters: A Teacher Resource Linking Math and Social Justice. D. Stocker

Week 8: Assessment and Evaluation in Mathematics

Growing Success
Assessment For, As and Of Learning
Provincial Achievement Chart in Mathematics
Accommodations and Modifications
Diverse Assessment Strategies and Rich Assessment Talks - UDL and Cultural Consideration

Learning Activities

Type	Name	Description
Reading	Week 8 Materials & Readings	1. Ontario Mathematics Curriculum: https://www.dcp.edu.gov.on.ca/en/curriculum/elementary-mathematics 2. Growing Success Document: Assessment, Evaluation, and Reporting in Ontario Schools, 2013 http://www.edu.gov.on.ca/eng/policyfunding/growsuccess.pdf
Assignment	Week 8 Self Assessment of Goal Setting and Participation	

Week 9: Assessment, Evaluation, and Reporting in Mathematics

Standardized Testing - EQAO
 Assessment Processes
 Assessment and Evaluation for Reporting
 Math and QDPA - Differentiation
 Practicum Preparation and Scavenger Hunt
 Rubric Analysis and Creation

Learning Activities

Type	Name	Description
Assignment	Week 9 Practicum Scavenger Hunt	1. Ontario Mathematics Curriculum: https://www.dcp.edu.gov.on.ca/en/curriculum/elementary-mathematic
Reading	Week 9 Materials & Readings	2. Growing Success Document: Assessment, Evaluation, and Reporting in Ontario Schools, 2010 http://www.edu.gov.on.ca/eng/policyfunding/growsuccess.pdf 3. http://www.eqao.com/en

Week 10: Number

Strand B Number
 Division
 Coding
 Decimals and Fractions
 Focus on STEAM
 Practicum Consolidation

Learning Activities

Type	Name	Description
Assignment	Week 10 Reflection for Mini Unit - Math, Coding and Integrative Topics	
Reading	Week 10 Materials & Readings	1. http://www.edu.gov.on.ca/eng/literacynumeracy/LNSAttentionFractions.pdf

Week 11: Number

Strand B Number and Strand C Algebra
Fractions, Decimals, Percents, and Ratio
UBD
Focus on STEAM
Scratch: Fractions and Repeating Patterns
Math Congress

Learning Activities

Type	Name	Description
Reading	Week 11 Materials & Readings	1. http://www.edu.gov.on.ca/eng/literacynumeracy/LNSAttentionFractions.pdf

Week 12: Number and Spatial Sense

Strand B Number
Fraction Number Talks
Strand E Spatial Sense
Developing Understanding of Line, Mass, Capacity, Time and Temperature
Real-life Applications, Including Estimations and Indigenous Ways of Knowing
Measurement Relationships
Math and Readers Theatre - Differentiation
Coding
Bansho

Learning Activities

Type	Name	Description
Reading	Week 12 Materials & Readings	1. https://wordpress.oise.utoronto.ca/robertson/2021/03/02/bryan-bellefeuille-shares-with-educators-how-he-includes-traditional-indigenous-mathematics-in-the-ontario-classroom/ 2. https://www.communityresearchcanada.ca/post/decolonizing-mathematics-education-an-interview-with-dr-ruth-beatty
Assignment	Week 12 Group Reflection of Mini Unit On-line Discussion	

Week 13: Spatial Sense

Strand E Spatial Sense
Measurement Relationships
Spatial Visualization and Orientation
2D Shapes and 3D Figures
Geometric Relationships
Location and Movement
Indigenous Ways of Knowing
Coding and Maker Education

Learning Activities

Type	Name	Description
Reading	Week 13 Materials & Readings	1. https://researchideas.ca/sidebyside/parallel.html 2. https://imaginethis.ca/megumi-harada/
Assignment	Week 13 Group Reflection of Mini Unit	

Week 14:

Spatial Sense

Strand E Spatial Sense
Spatial Reasoning
Math and Arts & Indigenous Ways of Knowing - Differentiation

Learning Activities

Type	Name	Description
Reading	Week 14 Materials & Readings	1. Paying Attention to Spatial Reasoning, K-12

Week 15:

Data

Math and Dance - Differentiation

Strand D Data
Various Data Management Representations
Conceptual Development of Probability
Consolidation of "Reflect and Connect"
Coding

Week 16:

Data

Strand D Data
Collecting, Organizing, and Displaying Data
Data Sense and Literacy - UDL
Data Management and Social Justice Themes

Learning Activities

Type	Name	Description
Reading	Week 16 Materials & Readings	1. MaththatMatters: A Teacher Resource Linking Math and Social Justice. D. Stocker

Week 17:

Home and School Connections and Course Reflections

Encouraging Real-Life Mathematics at Home
Communication with Home About Math
Computational Thinking Consolidation
Resources Consolidation
Rubric Creation for Choice Board Assignment
Tribes Graffiti
Inside-Outside Circle

Week 18:
Final Class

Completion of and Sharing of Choice Board Assignment for Consolidation of Class Learning

Assessment Activities		
Type	Name	Description
Assignment	Due Wk 08: Detailed Lesson Plan and Rationale	<p>Choose the grade and cluster of expectations from the division not used in the Lesson Consolidation assignment, for Strand C ALGEBRA CODING OVERALL EXPECTATION or Strand F FINANCIAL LITERACY. Use the 3-part lesson plan template provided. Discuss your rationale based on "knowledgeable others" and classroom experiences. Your rationale will also include a reflection of creating a culturally reflective lesson.</p> <p>Details will be discussed in class and through OWL. This assignment will be submitted through "ASSIGNMENTS" in OWL for assessment and feedback.</p>
Assignment	Due Wk 18: Choice Board Culminating Task	<p>During the final class, you will be completing and sharing your culminating task with group mates. You will give and receive feedback for further understanding and subsequent implementation of the key components of the course.</p> <p>Details will be available in class and through OWL. This assignment will be submitted through OWL.</p> <p>SMALL GROUP (2-3 STUDENTS) OR INDIVIDUAL</p>
Assignment	Due Wk 16: Integrative Mathematics Unit	<p>This is an integrative mini-unit that includes an introduction with a reflection of creating a culturally responsive classroom in the unit, a 5-day integration plan (full lesson plans with Math and Coding), a home-school connection activity with parent letter/video and a culminating task with rubric.</p> <p>Details will be discussed in class and through OWL. This assignment will be posted on-line in OWL and through "ASSIGNMENTS" for sharing.</p>
Assignment	Ongoing: Participation	<p>Class Participation On-line Sharing and Discussion Group: Culturally Responsive Financial Literacy Word Problem and Reflection</p> <p>Throughout the course, self and peer assessment will be completed as part of the learning and assessment process. The focus will be on feedback for growth and application to a variety of learning experiences and sharing sessions and applications.</p>
Assignment	Due Wk 06: Lesson Consolidation	<p>Prepare a lesson consolidation for the "Working On It" activity provided on the lesson plan template. You will complete the highlighted sections: "curriculum expectations", "anticipate student responses" , and "reflect and connect/consolidate".</p> <p>Details will be discussed in class and through OWL. This assignment will be submitted through "ASSIGNMENTS" in OWL for assessment and feedback.</p> <p>The focus of this assignment is twofold. One, is to practise and then incorporate learning in all subsequent 3-part lesson plans, the key components of contemporary lesson planning. Two, is to use the feedback from the instructor to develop subsequent full lesson plans, including the rationale for lesson composition.</p>

How to Protect Your Professional Integrity:

The Bachelor of Education is an intense and demanding program of professional preparation. Teacher Candidates are expected to demonstrate high levels of academic commitment and professional integrity that align with both Western University's Academic Rights and Responsibilities and the Professional Standards and Ethical Standards set by the Ontario College of Teachers. These expectations govern your time in class, in your Practicum, in your Alternative Field Experiences, and include the appropriate use of technology and social media.

The Teacher Education Office will only recommend teacher candidates for Ontario College of Teachers certification when candidates have demonstrated the knowledge of, and adherence to, the faculty policies throughout the two-year program.

To review the policies and practices that govern the Teacher Education program, including attendance, plagiarism, progression requirements, safe campus and more, visit: edu.uwo.ca/CSW/my-program/BEd/policies.html

Faculty of Education Pass/Fail Policy:

All courses and assignments in the Bachelor of Education are assessed as Pass/Fail.

Instructors will make the Success Criteria of the assignments clear, and refinements of the criteria may take place in class as a means of co-constructing details of the assignments in the first two weeks of a course. This will allow for differentiation of process, product and timeline depending upon student needs.

Success Criteria will

- Articulate what needs to occur to demonstrate learning outcomes for a course/assignment;
- Inform the instructional process so that teaching can be adapted to ensure students continue to remain on track to meet the criteria as needed and appropriate.
- Align with the assignments created to provide opportunities for students to demonstrate the knowledge, skills and abilities they are working toward;
- Establish clear descriptive language that allows Teacher Candidates to identify, clarify and apply the criteria to their work and to their engagement in peer feedback;
- Focus the feedback on progress toward meeting the overall and specific tasks/assignment goals for the course.

Participation

Participation is essential to success in the Teacher Education program. As a professional school, you need to treat coming to class as showing up for work in the profession. If you are not in class, you cannot participate. Actively participating in discussions, peer reviews/feedback, group work and activities is integral to the development of your own learning and to the learning within your classroom community.

Given the varied experiences of Teacher Candidates in the program, you may engage with ideas/concepts or skills that are familiar or unfamiliar to you.

A Professional Teacher Candidate is one who:

- Arrives in class (virtual or on-site) on time, and prepared. This includes completing any readings, viewing assignments or tasks in advance of class as requested.
- Listens to others and contributes thoughtfully to discussions;
- Models respectful dialogue and openness to learn, monitors, self-assesses and reformulates one's prior beliefs and understandings in light of new information;
- Monitors and addresses their wellness, practices self-care, and seeks appropriate support when necessary.

Ontario Curriculum & Supplementary Resources:



**Curriculum &
Resources**

dcp.edu.gov.on.ca/en

Campus Services & Resources:



**Health and
Wellness**

uwo.ca/health



Peer Support

westernusc.ca



Learning Skills

uwo.ca/sdc/learning



**Indigenous
Services**

Indigenous.uwo.ca



**Student Accessibility
Services**

sdc/uwo.ca/ssd



Writing Support

writing.uwo.ca



**Financial
Assistance**

registrar.uwo.ca



Not sure who to ask?

Contact the Teacher Education Office at eduwo@uwo.ca