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.
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

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<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Description</th>
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<tbody>
<tr>
<td>Assignment</td>
<td>Week 1 Online</td>
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<td>Sharing</td>
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<td>Scavenger Hunt</td>
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<td>Part 1</td>
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<tr>
<td>Reading</td>
<td>Week 1 Materials &amp; Readings</td>
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<tr>
<td></td>
<td>1. Gadanidis, G. (2012). Why can’t I be a mathematician?</td>
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<td></td>
<td>2. Ontario Mathematics Curriculum:</td>
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**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

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<thead>
<tr>
<th>Learning Activities</th>
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</table>
2. The Affordances of Coding: [https://imaginethis.ca/educating-young-mathematicians-3-five-as-for-coding-math/](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

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<tr>
<th>Learning Activities</th>
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</table>
| **Assignment** | Week 3 Online Sharing | 1. eeworkshop.on.ca/edu/core.cfm  

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

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<tbody>
<tr>
<td>Reading</td>
<td>Week 4 Materials &amp; Readings</td>
<td>1. scratch.mit.edu</td>
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<tr>
<td>Assignment</td>
<td>Week 4 Self-Assessment and Goal Setting - Class and Online Participation</td>
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## 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

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<tr>
<td>Reading</td>
<td>Week 5 Materials &amp; Readings</td>
<td>1. <a href="https://learnx.ca/growing-patterns/">https://learnx.ca/growing-patterns/</a></td>
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<td>2. <a href="https://ontariomath.support/?pg=results&amp;type=subject&amp;lang=EN&amp;subject=FinLit">https://ontariomath.support/?pg=results&amp;type=subject&amp;lang=EN&amp;subject=FinLit</a></td>
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<tr>
<td>Assignment</td>
<td>Week 5 Online Sharing</td>
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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

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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

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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

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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

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Week 10:
Number

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

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2022-2023 EDUC 5180K
**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

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**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

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<td><strong>Name</strong></td>
<td><strong>Description</strong></td>
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<tr>
<td><strong>Assignment</strong></td>
<td>Week 12 Group Reflection of Mini Unit On-line Discussion</td>
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**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

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<td>2. <a href="https://imaginethis.ca/megumi-harada/">https://imaginethis.ca/megumi-harada/</a></td>
</tr>
<tr>
<td>Assignment</td>
<td>Week 13 Group Reflection of Mini Unit</td>
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## Week 14:

**Spatial Sense**

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

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<th>Type</th>
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<tbody>
<tr>
<td>Reading</td>
<td>Week 14 Materials &amp; Readings</td>
<td>1. Paying Attention to Spatial Reasoning, K-12</td>
</tr>
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## 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

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## 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

<table>
<thead>
<tr>
<th>Assessment Activities</th>
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<tr>
<td><strong>Assignment</strong></td>
<td>Due Wk 08: Detailed Lesson Plan and Rationale</td>
<td>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 &quot;knowledgeable others&quot; and classroom experiences. Your rationale will also include a reflection of creating a culturally reflective lesson. Details will be discussed in class and through OWL. This assignment will be submitted through &quot;ASSIGNMENTS&quot; in OWL for assessment and feedback.</td>
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<tr>
<td>Assignment</td>
<td>Due Wk 18: Choice Board Culminating Task</td>
<td>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. Details will be available in class and through OWL. This assignment will be submitted through OWL.</td>
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<tr>
<td>Assignment</td>
<td>Due Wk 16: Integrative Mathematics Unit</td>
<td>SMALL GROUP (2-3 STUDENTS) OR INDIVIDUAL 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. Details will be discussed in class and through OWL. This assignment will be posted on-line in OWL and through &quot;ASSIGNMENTS&quot; for sharing.</td>
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<tr>
<td>Assignment</td>
<td>Ongoing: Participation</td>
<td>Class Participation On-line Sharing and Discussion Group: Culturally Responsive Financial Literacy Word Problem and Reflection 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.</td>
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<tr>
<td>Assignment</td>
<td>Due Wk 06: Lesson Consolidation</td>
<td>Prepare a lesson consolidation for the &quot;Working On It&quot; activity provided on the lesson plan template. You will complete the highlighted sections: &quot;curriculum expectations&quot;, &quot;anticipate student responses&quot;, and &quot;reflect and connect/consolidate&quot;. Details will be discussed in class and through OWL. This assignment will be submitted through &quot;ASSIGNMENTS&quot; in OWL for assessment and feedback. 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.</td>
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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 polices 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