EDUC 5485
Designing Aesthetic Experiences For Young Mathematicians

Instructors:
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T: (226) 238-0684
Office Hours: by appointment

Schedule:
Section 001: Thursday, 4:30-6:30 PM
Room: 2046

Program Context:
This is a Specialty Course taken by Teacher Candidates in Mathematics Specialty during Year 1 and Full Term of the Bachelor of Education.
**BEd Course (EDU 5485)**

Teacher candidates will engage in arts informed design of mathematics learning experiences, based on personal interests and needs, and perceived mathematics learning needs of Primary/Junior students. Teacher candidates will develop a capacity for addressing the "artistic puzzle" of making mathematics learning experience a "story" worthy of human attention. 2 hours per week, full year, .5 credit.

The teacher candidates in this course will begin to learn how to design aesthetic mathematical experiences for primary and junior students that include the following:

- a beautiful mathematical idea
- an engaging story about a mathematics concept
- a surprise or wonder at the way a problem could be solved in many ways
- excitement for learning math concepts
- solving problems in novel and creative ways
- working cooperatively to develop understanding
- investigating mathematics links to the world around them

**Number of Weeks: 18**

**Week 1: Introduction to Course, Assignments & Each Other**

- Introductions
  - What’s Changed in Mathematics
  - How has the pandemic changed education
  - Teaching Strategies
  - Amazing Race
  - Bitmoji Classroom
  - Who is a Mathematician? What is Math Aesthetics? What are myths or misconceptions of mathematics?
  - Which one doesn’t belong? (WODB)
Week 2: Curriculum and Pedagogy in Mathematics

- How do you feel about teaching math? How is it beautiful?
- PMI: Positive Minus Interesting
- Which one doesn't belong (WODB) and estimation jars
- New math curriculum: coding

Learning Activities

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<th>Type</th>
<th>Name</th>
<th>Description</th>
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Assessment Activities

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<tbody>
<tr>
<td>Formative Assessment</td>
<td>Week 2 Online response</td>
<td>Post Mini CRA Model to Padlet</td>
</tr>
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Week 3: Curriculum and Pedagogy in Mathematics

- Assessment
- Let's create our own mathematical clothesline
- CRA Model
- Choice boards
- 3 Act Math

Assessment Activities

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<tbody>
<tr>
<td>Formative Assessment</td>
<td>Week 3 Online Response</td>
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Please comment on Clothesline or 3 Act Math, What did you like/dislike. How can you see this being used in your own classroom.

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**Week 4: Designing an Aesthetic Experience**

- What is a rich task?
  - PRIME diagnostic
  - Fractals
  - Measurement
  - Mini Lesson
  - Review Assignment

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<th>Learning Activities</th>
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<tr>
<td>Type</td>
<td>Reading</td>
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<tr>
<td></td>
<td>Week 4 Reading</td>
<td>Stager, G. (2018). The Lost Art of Teaching (podcast).</td>
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<th>Assessment Activities</th>
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<tbody>
<tr>
<td>Formative Assessment</td>
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<td>Share Experience</td>
<td>Share completed aesthetic experiences component</td>
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**Week 5: In Class Assignment and Planning**

- Assignments overview and due
- Long term planning
- Rubrics
- Google Classroom

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<tbody>
<tr>
<td>Formative Assessment</td>
<td></td>
<td>Post Image of Poster</td>
<td></td>
<td>Please post video of your interactive poster on OWL Resources Tab</td>
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**Week 6: Math circles & Thinking Classroom**

- Tactile items
- Circles
- Building thinking classrooms - Peter Liljedhal. VPNS

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<th>Description</th>
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<tbody>
<tr>
<td>Reading</td>
<td>Week 6 Reading &amp; Viewings</td>
<td>Gadanidis, G. (2015). Coding as a Trojan Horse for Mathematics</td>
</tr>
</tbody>
</table>
Week 7: Early Number Sense & Math Games

- Why Math Games?
- Subitizing
- Verbal Counting
- Number identification and counting.
- Object counting and cardinality

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Week 8: Rich Math Tasks & Assignment 3

- Students will explore a variety of rich mathematical tasks and create a task analysis.
- They will gather in groups and select an idea to attempt throughout their practicum.
- In the new year, students will share one task they attempted and outline curriculum expectations along with other themes touched on through the course.
Week 8 Reading & Materials


Assessment Activities

Type | Name | Description
--- | --- | ---
Formative Assessment | Week 8 Assignment | Students work in groups to plan a task analysis. Teacher candidates will share at least one idea next week and share it to OWL.

Week 9: Task Analysis & Growing Patterns

- If you asked teachers what they found beautiful in mathematics, would they be able to:
  - Describe a beautiful mathematical idea?
  - Tell an engaging story about a mathematics concept?
  - Relay a surprise or wonder at the way a problem could be solved in many ways?
  - How they solve problems in novel and creative ways?
  - How mathematics is linked and related to so many things around them?

Week 9 Reading


Week 10: Task Analysis Presentations Assignment 3 Presentation

- Students to present one task analysis to the class
- Teacher candidates are highly encouraged to utilize creative measures to present material
- All task analyses are to be posted to OWL
- More to come in class

Week 11: Math Centres

- How to foster centres?
- Guest presenter

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<tbody>
<tr>
<td>Reading</td>
<td>Week 11 Reading</td>
<td>BBHCSD Media; BBHCSD Media, (2014). STEM Education Overview. <a href="https://www.youtube.com/watch?v=5GWhwUN9iaY">https://www.youtube.com/watch?v=5GWhwUN9iaY</a></td>
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Week 12: Math Escape Rooms

- Math in nature
- Fibonacci sequence
- Rich learning experience
- Escape room

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Week 13: Coding & Computational Thinking in K-10

- Unplugged grids and loops
- Micro:bit. Write the code to create a thermometer
- Scratch coding
- Assessment
- Knowledgehook

### Assessment Activities

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<tr>
<td>Assignment</td>
<td>Post to OWL</td>
<td>Teacher candidates will choose one of the suggested activities that were organized using Gardiner's multiple intelligences. Activities to be posted on OWL.</td>
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Week 14: Geometry & Patterning & Algebra

- Explore math circles and their relevance
- Math Tools & their affordances
- Desmos

### Learning Activities

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**Week 15: Computational Thinking & Coding**

- What is computational thinking?
- Why is this relevant in 21st century classrooms?
- Explore micro:bit (interactive microcontroller)
- How does this work in K-12?

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<td>Reading</td>
<td>Week 15 Reading</td>
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**Week 16: Patterning, Algebra & Graphing**

- Patterning rules
- Outdoor applications
- Placemats
- Decimals

**Week 17: Long Term Planning in a Mathematical program**

- Guided math
- Long term planning
- Gap closing
- Resource sharing

**Week 18: Conclusions & Presentations**

- Course wrap-up
- Teacher candidates presentations

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<tr>
<td>Type</td>
<td>Assignment</td>
<td>Due Wk 18, Assignment 4, Details(Specifics in OWL) Final Presentations</td>
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2022-2023   EDUC 5485
# ASSIGNMENTS

## Assessment Activities

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|      | Assignment #1 | Due Wk 5  
Assignment 1  
Resource Sharing  
Teacher candidates will bring in a resource (idea, community connection for field trip, experiment, lesson, etc.) which your group will share with the class. You will be responsible for providing ideas pertaining to curriculum, along with a detailed sequence of events (how, when, why). These will be uploaded onto OWL.  
Please focus on creative solutions. Both slides and documents are adequate but consider additional mediums including video, audio, web applications, etc.  
Materials to be shared and posted to OWL. |
| Assignment #2 | Due Wk 7  
Assignment 2  
In Class Poster  
Students will create an interactive poster which can be created in a variety of ways. Work to be completed in class.  
Students will create an interactive poster which can be created in a variety of ways. Work to be completed in class. Students evaluated based on application of ideas, creativity, and pedagogical outcomes. |
| Assignment #3 | Due Wk 12:  
Assignment 3  
Task Analysis  
Teacher candidates are responsible for includes, a detailed overview, lesson, experience.  
Students will explore a variety of rich task analysis. They will gather in groups and select an idea to attempt throughout the year, students will share one task they attempted and outline curriculum experiences touched on throughout the course.  
Teacher candidates are responsible for includes, a detailed overview, lesson, experience. |
Assignment #4

Due Week 17-18
Assignment #4
Choice Board

Complete one of these activities paying and reflection based on in class experience posted to OWL.

- Write a brief description of what you did learned. Include pictures or some way words).
- Reflect on how the aesthetic dimension learning of mathematics.

Formative Assessment

Ongoing Professionalism & Participation

Consistently demonstrates respect, integrity, and embodying the traits of a professional educator.

This course meets the following Competencies:

Mathematical Idea: A beautiful mathematical idea.

Engaging Story: An engaging story about a mathematics concept.

Surprise or Wonder: A surprise or wonder at the way a problem could be solved in many ways.


Solving Problems in Creative Ways: Solving problems in novel and creative ways.

Work Cooperatively: Working cooperatively to develop understanding.

Investigating Mathematics Links: Investigating mathematics links to the world around them.
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