Faculty of Education
The University of Western Ontario
B.Ed. Course Outline

Teaching and Learning Mathematics, EDUC 5136
Monday, 10:30 – 12:30pm, Room 2049

Instructor: Marja Miller
Email: mgbertra@uwo.ca
Office: 2045, Office Hours: By appointment.

Calendar Copy:

The professional and theoretical perspectives associated with learning and pedagogy in mathematics. Participants will be expected to reflect critically on both theory and practice, based upon psychological, epistemological, mathematical, and current pedagogical and curricular approaches, in light of how mathematics is taught in schools.

Learning Outcomes:

Pre-service candidates will:

- Review, discuss and reflect on theory and research on teaching and learning mathematics
- Prepare for teaching mathematics in the intermediate and senior grades in accordance with OCT Standards of Practice
- Refine individual points of views and philosophies with regard to teaching and learning mathematics
- Discuss a wide spectrum of points of view on mathematics education
- Actively share learning, teaching and other experiences related course activities
- Actively engage in mathematics activities arising from specific tasks
- Explore, share, and reflect on emerging technologies in mathematics education

Course Content:

This course will focus on introducing the pre-service teachers to:

- research and theory of mathematics teaching and learning
• the mathematics curriculum for the intermediate and senior grades
• mathematics pedagogy and classroom practice
• creating rich mathematics contexts to engage students
• methods of differentiated instruction
• use of technology to enhance student learning
• resources for lesson planning

Course Materials:

All course material will be provided in class or made available online.

Assignments and Other Course Requirements:

1. Explore a Technology (10%) Due: Monday, September 12, 2016
Technology is a dynamic tool that can enhance the learning experience of the student in a mathematics classroom (NCTM, 2000). The problem is that some teachers do not feel comfortable or confident integrating technology into the mathematics classroom (Hartsell et al., 2010). So this assignment will provide you with the opportunity to explore a technology of your choice, like a math app, handheld device, interactive whiteboard (smart board) or another technology to teach a mathematic concept. Your mini-lesson should be interactive and demonstrate how the technology can be used to teach a math concept. The presentation should be approximately 5-7 minutes depending on the size of the class.

2. Lesson Study: Reflecting & Learning in Depth (40% total, 2 x 20% each) Due: Pending upon sign up
Since 1999, teachers have been engaging in "lesson study" to improve their teaching. Lesson study, developed in Japan, is a process in which teachers jointly plan, observe, analyze, and refine classroom lessons called "research lessons". Lesson study is widely credited for the steady improvement of Japanese elementary mathematics instruction. As you prepare for teaching next year, you will be collecting ideas, activities, resources etc. that you consider to be exemplary, and will help you in realizing your own vision of excellence in the teaching and learning of mathematics. For this assignment, you will be responsible for preparing a research lesson to be presented in class to share these ideas you have been collecting.

You will work in pairs. The same grade will be awarded each member of the group for the research lesson delivered in class. You will have approximately 30 minutes for your lesson. Plan to teach the lesson as though you are teaching to the grade level of your lesson; following the lesson, there will be a constructive dialogue with the whole class about the lesson; you will be required to provide a lesson plan for each student in the class at the time of your presentation.

Be sure to come prepared with all the teaching and learning materials needed. Your presentation should be highly interactive.
3. **Assessment and Evaluation Tools (50%) Due: Monday, January 23, 2017**

A key component of teaching is the assessment and evaluation of learning. The purpose of this assignment is to critically examine two different mathematics assessment or evaluation artifacts from your practicum and relate these artifacts to teaching and learning and *Growing Success* (2010). For this assignment, you will need to consult with your Associate Teachers to gather the artifacts and to request permission to use the artifact as part of this assignment.

The assignment will include: (1) two different MATHEMATICS artifacts, (2) an explanation of whether the artifact is an ASSESSMENT or an EVALUATION, (3) the purpose of the tool (FORMATIVE, SUMMATIVE, ASSESSMENT AS/FOR/OF LEARNING), (4) curriculum expectations evaluated by the tool, (5) how the tool might be MODIFIED for different learners, (6) how the tool might be ACCOMMODATED for different learners, and (7) steps that you might take to improve the tool. Use the previous seven items as headings in your written submission. The written submission should not exceed TWO PAGES per artifact. Copies of assessment tasks should be included with your assignment. Your analysis should including the use of appropriate assessment terminology and key assessment considerations from the Ministry policies.

**References**


**Policy Statements:**

**Accessibility:** The University of Western Ontario is committed to recognizing the dignity and independence of all students and seeks to ensure that persons with disabilities have genuine, open and unhindered access to academic services. Please contact the course instructor if you require course materials in an alternative format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for information about requesting academic accommodation, or go to the following website: [http://www.edu.uwo.ca/programs/preservice-education/documents/policies/Accessibility_Western.pdf](http://www.edu.uwo.ca/programs/preservice-education/documents/policies/Accessibility_Western.pdf)

**ATTENDANCE:** The B.Ed. program is an intense and demanding programs of professional preparation. You are expected to demonstrate high levels of both academic and professional integrity. Such integrity is demonstrated in part by your commitment to and attendance at all classes, workshops, tutorials, and practicum activities. Read more about the Faculty’s attendance policy on-line: [http://www.edu.uwo.ca/programs/preservice-education/Attendance%20Policy%202016.pdf](http://www.edu.uwo.ca/programs/preservice-education/Attendance%20Policy%202016.pdf)

**EXCUSED ABSENCES:** If you are ill, require compassionate leave, or must miss classes for religious observance, your absence is excused; you will not be penalized but you are responsible for work missed.

**UNEXCUSED ABSENCES:** Any absence that is not a result of illness, bereavement, or religious observance is an unexcused absence. Three unexcused absences will result in you being referred to the Associate Dean and placed on academic probation. Any further unexcused absence will result in failure of the course and withdrawal from the program.

**Language Proficiency:** In accordance with regulations established by the Senate of the University, you must demonstrate the ability to write clearly and correctly. Work which lacks proficiency in the language of instruction is unacceptable for academic credit, and will either be failed or, at the discretion of the instructor, returned to you for revision to an acceptable level.

**Late Penalties:** Normally, the only acceptable reasons for late or missed assignments are illness (which you must report to the Teacher Education Office) or extreme compassionate circumstances. Unexcused late assignments will be penalized at a rate of 5% per day, and will not be accepted more than 7 days after the due date unless prior arrangements have been made with the instructor.

**Academic Offences:** Scholastic offences are taken very seriously in this professional Faculty. You are, after all, going to be a teacher. Read about what constitutes a Scholastic Offence at the following Web site: [http://www.edu.uwo.ca/programs/preservice-education/documents/policies/WEB_ScholasticDiscipline.pdf](http://www.edu.uwo.ca/programs/preservice-education/documents/policies/WEB_ScholasticDiscipline.pdf)

**Plagiarism:** Plagiarism means presenting someone else’s words or ideas as your own. The concept applies to all assignments, including lesson and unit plans, laboratory reports, diagrams, and computer projects. For further information, consult your instructors, the Associate Dean’s Office, and current style manuals. Advice about plagiarism and how to avoid it can also be found here: [http://www.edu.uwo.ca/programs/preservice-education/documents/policies/WEB_PlagiarismPolicy.pdf](http://www.edu.uwo.ca/programs/preservice-education/documents/policies/WEB_PlagiarismPolicy.pdf)

**Plagiarism-Checking:**

1. All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com ([http://www.turnitin.com](http://www.turnitin.com)).
b. Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Use of Laptops & Notebooks in Class: As a courtesy to members of the class, please put your cell phone on ‘vibrate’ or turn it off during class. Laptops and other electronic devices may be used in a professional manner to facilitate your activities in the course, but out of courtesy to colleagues and the instructor, please do not engage in personal networking and non-course communication during class time – save it for before or after class, or for the break.

SUPPORT SERVICES

A variety of support services are available at Western.
If you need advice or assistance, do not hesitate to get in touch with any of these services.

FINANCIAL ASSISTANCE: Registrarial Services (http://www.registrar.uwo.ca)

WRITING SUPPORT: Student Development Centre (http://www.sdc.uwo.ca/)

LEARNING SKILLS SUPPORT: Student Development Centre (http://www.sdc.uwo.ca/)

INTERNATIONAL STUDENTS: Student Development Centre (http://www.sdc.uwo.ca/)

ABORIGINAL STUDENTS: Student Development Centre (http://www.sdc.uwo.ca/)

STUDENTS with DISABILITIES: Student Development Centre (http://www.sdc.uwo.ca/)

SOCIAL & CULTURAL ISSUES: University Students’ Council (http://westernusc.ca/services/).

EMOTIONAL or MENTAL DISTRESS: Students who are in emotional or mental distress should refer to Mental Health @ Western http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help.

B.Ed./Dip.Ed. PROGRAM ISSUES: zuber@uwo.ca, Teacher Education Office, room 1166

NEED HELP but not sure what to do: zuber@uwo.ca, Teacher Education Office, room 1166