



Course Title: **Mathematics (Intermediate)**

Instructor: Dr. Tim Sibbald, OCT

Course Value: 3 credits

Location: H111 North Bay Campus

Classes: Thursday and Friday 8:30-10:30

Course Code: **Educ4778 (legacy Educ4466)**

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** Note the schedule for this course is based on the consecutive BEd year 1 schedule.

Office Hours: Not specific, but I will typically be in my office 10:30-3:30 on Monday, Wednesday, and Thursday. You are welcome to stop in other times or email if you have a specific time in mind.

Textbook:

There is no formal textbook for this course. However, you should regularly consult the following resources that are available electronically. Your instructor has several textbooks that are used for this course at other institutions (they have an American emphasis) and you are welcome to consult them.

- ✓ Ministry of Education Curriculum Documents
- ✓ Growing Success (2010) – regarding assessment, evaluation and report cards.
- ✓ Think Literacy: Grades 7-12 subject specific documents – Mathematics grades 10-12 (2005).
- ✓ Targeted Implementation and Planning Supports for Revised Mathematics (TIPS4RM)
- ✓ Please also consult EduGains, MathClips, Mathies, and the other online resources provided by the Ministry of Education.

Course Description:

Teacher candidates engage in a detailed study of curriculum topics regarding mathematical content and current math education issues with attention to abstract concepts and bridging the elementary/secondary school divide. Candidates consider key issues for 21st century learners and effective means of using technology.

Learning Outcomes:

By the end of this course, students will:

1. Develop math knowledge and pedagogy relevant to instruction, assessment, and evaluation for the intermediate division.
2. Select appropriate teaching/assessment/learning methodologies to advance learner growth based on a process of gathering, reviewing, interpreting, and evaluating.
3. Develop awareness of how technologies suited to mathematics instruction (including manipulatives) enhance learning.
4. Acquire an understanding of subject-specific and general teaching methodologies, strategies, and techniques.

5. Select appropriate instructional resources to advance learner growth based on a process of gathering, reviewing, interpreting, evaluating student understanding.
6. Constructs appropriate learning plans (e.g. lesson plans and longer-range plans) within the context of assessment of learners' needs, the learning environment, provincial expectations, etc.
7. Demonstrate an understanding of limits of their own knowledge and ability.

Course Schedule		
Week	Thursday class	Friday class
1	Jigsaw jumpstart to the curriculum. Strands across the grades.	Prep for fishbowl. Questioning and answering. Mathematical communication.
2	Fishbowl Event	What is a rich learning task? Distinguishing Knowledge, Application, Inquiry and Communication. Fishbowl write-up due Sept. 23, which is before the next class.
3	Discuss fishbowl event. Bringing together technologies for a single coherent picture – bring your laptop.	Bring your laptop – GeoGebra and Geometer Sketchpad. Address assignment 2.
4	Teaching tools – Calculators. Bring a calculator if you own one. Brief overview of graphing calculators,	Paper folding your way through the curriculum. Assignment 2A due by noon.
Practicum	<i>Have a good practicum!</i> No classes for consecutive or concurrent students. Oct. 12-13, 19-20, 26-27	
5	Organizations and third party resources.	Groups, routines, anchor charts, differentiation, for teaching mathematics.
6	Algebraic reasoning. Demonstration of accessing educational articles.	Assessment and evaluation. Assignment 2B due by noon.
7	EQAO grade 6 &9.	Enrichment – how can we encourage talented students?
8	Locally developed? Course route advising for math.	Coordinate geometry – from first quadrant graphing to analytic geometry. Assignment 3 due by 10pm.
9	Where does “intermediate” meet “senior”? Transitions in the school system.	Issues in mathematics education. Course evaluation.

Evaluation:

All evaluations are to be submitted through BlackBoard unless there are extenuating circumstances requiring the use of a hardcopy. If you run into problems submitting an assignment via BlackBoard you can email it to me; should this be necessary it is helpful if all attached file names starts with your last name and the email identifies the course you are in. All standard file formats are accepted and I will email you if there is any issue with a particular format. In the past Word, Adobe, Pages, and OpenOffice have all been used successfully.

Marked assignments will be returned electronically using inserted comments. Note that in some software, such as the Adobe Reader, it may be necessary to turn on the comments in order to see them. Please also be advised that in the following assignment explanations the rubrics are only presented with levels 2 to 4+ because I am an optimist. Levels of 1 and “R” will be used when necessary and details will be provided should this occur.

Evaluation, for this course, is composed of three assignments:

(Note that if you are a Educ-4466 concurrent student there is some overlap with concurrent Educ-4334, but the assignments are expected to be unique between the two courses.)

1. “Welcome to the Fishbowl”

A fishbowl refers to activities where there are two groups with one being actively engaged (in the fishbowl) and the other group monitoring (outside the fishbowl). In this task, you will be assigned to a group of approximately six people. The group will decide on an 15-minute grade 7 or 8 ‘lesson’ that is to be taught, with minimal preparation, using any resources you feel are appropriate in the classroom. From the group of six, two groups of three have to emerge and they will be called A and B hereafter. Group A will implement their 15-minute lesson plan first (another group of 6 will be the class) and group B will observe. Following the lesson the group of six (A and B) will get together and revamp the lesson based on what took place. Then group B will implement (with a different group of 6 as the class) while group A observes. This will be followed by a discussion session. Fishbowls will take place on Wednesday, Sept. 21.

Please recognize that the ‘event’ emphasizes thinking in the moment and does not have much planning. The focus is learning outcomes #5 and #7 and provides a starting point for developing other learning outcomes. You should approach the event being aware that the situation is not amenable to ideal teaching, is not graded, and that it is the subsequent analysis of what happened, in less than ideal circumstances, that is ultimately important.

After the event, write up a series of reflections from the perspectives of the different roles you played in the exercise. Note that you are writing up about the fishbowls you participated in whether you were teacher, observer, or a student being taught. Your observations may include the way planning took place. In your reflections consider the merits of techniques and resources that are used. Please write in a professionally respectful manner. No minimum or maximum length will be imposed but, generally, a page for each stance is considered reasonable. Write up is due Saturday, Sept. 23 by midnight. (Value 25%)

Criterion	4+ (90-100)	Level 4 (80-89)	Level 3 (70-79)	Level 2 (60-69)	Level 1 (50-59)
Teacher role	Level 4 with ties to theoretical aspects.	Engaging explanation that draws relevant aspects together in a coherent picture.	Relevant consideration of aspects of the first round.	Considerations of the first round are of limited relevance to teaching.	Minimal consideration of aspects of the first round.

Student	Level 4 but with a coherent overall view of both individual students and the class as a whole.	Articulation of differences between the two rounds in terms of effectiveness of instructing and handling students.	Clear observations about interactions between teachers and class.	Considers role as a student but does not note observations about interactions of teachers with role-playing students.	Limited consideration of role as a student.
Observer	Level 4 with ties to theoretical aspects.	Observations from different fishbowls are integrated into a coherent picture and assessed in terms of the observer's views on teaching.	Observations are made and appraised in terms of the observer's own teaching.	Observations are made but are not appraised in terms of the observer's own teaching.	Limited observation provided. Note cases of only commenting on 1 or 2 other fishbowls fit with this.
Clarity	Integrated into the presentation so that it is never an issue.	Very clear what the circumstances were and your role in them.	Sufficiently clear to follow the reasoning you present.	Sometimes unclear which role, what the circumstance was, or who was involved.	The explanation would be unclear to anyone who was not there.

2. "The Devil is in the Conceptual Details" –

A) Develop a hardcopy resource electronically that clearly details the concepts underlying a major expectation in the curriculum (ex. The Pythagorean theorem). The resource must include *at least* one graph, an equation, a photo, and text. It should be two single spaced pages maximum in a 12 point font. The explanation should include:

- ✓ At least two mathematical ways of understanding the concept.
- ✓ How the details of the concept can be used to support instruction
- ✓ Why students may benefit from understanding the concept as opposed to simply being able to work with the idea.
- ✓ A self-evaluation of explaining the concept that is not included in the two page maximum for the explanation. Note that I aim to give constructive suggestions for any challenges you raise – you will not be evaluated based on revealing challenges. You will be evaluated for how well you convey the challenges (because that is what you do in parent-teacher interviews).

This assignment will be posted on BlackBoard so that your peers are able to see it. If you do not want to post the self-evaluation you may email it to the instructor indicating that preference.

B) You will be assigned four resources that you have to evaluate in a report card manner. Report card comments are to be professional and conform to the OCT duties of care and respect. Please use the following template.

Criterion	Exceptional "5" (4+) (90-100)	Excellent Level 4 (80-89)	Good Level 3 (70-79)	Moderate Level 2 (60-69)	Limited Level 1 (50-59)
How clear is the concept based on this resource?					
How effective is the advice on instructional support?					
How accurate is the explanation					

of the benefits of explaining the concept? Are there other ideas that should have been considered?					
"Report Card" Comment:					

Please submit your marks in the assignment (i.e. private) section of BlackBoard as a "bland" spreadsheet (i.e. no bold, no borders, no unusual fonts, no color, no word wrapping the comment, etc.) with one line per person with their last name in the first cell, the three numerical scores (use "5" instead of 4+) in the next three cells and the report card comment in the 5th cell. Note that there is benefit in typing your comment in a word processor that has spell-checking and then cut and pasting.

Part A – Due **Oct. 6** by start of class - Value 25%

Part B – Due Nov. 10 by start of class - Value 10% (Note, I grade your comments and feedback.)

3. "Keeping up with the profession"

Identify four articles from professional resources that are relevant to teaching mathematics. You need to include the articles unless otherwise stated in the course. You may work with a partner; however, if you do then you must have eight articles.

Evaluate the collection of articles from the point of view of teaching mathematics in an Ontario classroom. Demonstrate the versatility of the resource to address all strands for grade levels 7-10. Note that the library has several databases in addition to teacher journals – access will be demonstrated in class. It is worthwhile emphasizing practical articles, but including at least one research article is appropriate to being a classroom teacher.

Grading will be based on 4 articles at 8% each for the quality of connection made to the curriculum and instructional practices, 5% for a balanced selection across strands and achievement categories, 3% for developing your collection with additional considerations of your own choosing (Perhaps the articles have a theme?)
(40%, due Dec. 1 by 10pm)

Note regarding use of third party materials: Teachers routinely modify materials from third parties. In this course, it is necessary to cite all third party resources that you have contributed significantly to the development of your work. It is your responsibility to provide the source of materials you use. For example, if you find a lesson plan on the internet and adapt it to your teaching with a new lesson plan, you should include a statement that provides the URL for the original lesson plan. (Note: submission of the third party lesson plan constitutes academic dishonesty.)

Please be aware of my policy regarding extensions for assignments. All extensions must be negotiated prior to the due date and that, even with an extension, marks can be deducted according to the circumstances of the extension. In all circumstances, including marks of zero, students may hand in the assignment for descriptive feedback.

Important Course Policies:

1. This course outline contains all pertinent information with regard to expectations for and requirements of this course.
2. Students are expected to arrive for class on time, be prepared (i.e., required readings completed before class), and to conduct themselves professionally. This means that activities such as talking out of turn, completing work for other courses, listening to iPods, checking cell phone messages, web-surfing, and using computer applications such as email and Facebook are inappropriate in-class activities and are a distraction to you, your classmates, and the instructor.
3. Students must use their Nipissing e-mail address when emailing the course instructor. All email communication should be professional in tone and content.
4. If a student is absent for a scheduled test or in-class assignment, it is the student's responsibility to contact the instructor as soon as possible. The student must provide appropriate documentation for the absence before a request to make up missed work will be considered.
5. Students are responsible for keeping back-up copies of all written work and assignments for this class.
6. Assignments have identified due dates. Work must be submitted on time. Extensions must be negotiated prior to the due date and will only be considered in cases of extenuating circumstance and at the discretion of the professor. A late penalty of 5 percent per day will be assessed on all late assignments.

7. University Policy Reminders:

Please review the policies that pertain directly to attendance and exams.

The attendance policy is found at the following link:

<http://www.nipissingu.ca/calendar/regulations/academic/Pages/Attendance.aspx>

The Nipissing University policy on academic dishonesty in the Course Calendar -

<http://www.nipissingu.ca/calendar/regulations/academic/Pages/Student-Appeals-and-Petitions.aspx#dishonesty>

8. Student Accessibility Services (SAS)

Student Accessibility Services assists students with permanent and temporary disabilities. Disabilities supported include, but are not limited to: Learning Disabilities, Mental Health, ADHD, Sensory Disabilities, Medical Disabilities and Physical Disabilities

If you have or suspect you have a disability for which you require academic accommodation or supports, please visit the SAS team in B210 or get more information on the Nipissing University SAS webpage (www.nipissingu.ca/sas).