



Course Title: **Mathematics (Intermediate)**

Course Code: **Educ4466**

Instructor: Dr. Tim Sibbald, OCT

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Course Value: 3 credits

Tel. 705-474-3461 ext. 4653

Location: H111 North Bay Campus

Office: H233

Classes: Wednesday 4:30-6:30, Thursday 2:30-4:30

Office Hours: Tuesday 1:30-2:30, Wednesday 2:30-3:20, Friday 11:30-12:20

You are welcome to stop in other times.

Textbook: The following resources are available electronically and should be consulted through the course.

- ✓ 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)

Course Description: A critical study of the aims, scope and sequence of the Intermediate Division curriculum in Mathematics; analysis of Ministry guidelines; practicum.

Learning Outcomes: By the end of this course, students will:

1. Demonstrated a detailed understanding of instructional methods for teaching the Ontario intermediate mathematics curriculum.
2. Develop lesson and unit plans with varied approaches to teaching and learning that will include the use of manipulatives, open ended questioning, inquiry based learning and appropriate use of technology.
3. Demonstrate critical appraisal of teaching resources that are available to teachers.
4. Demonstrate an awareness of issues pertaining to intermediate math instruction including, but not limited to, accommodating students with IEPs, gender awareness and cross-cultural inclusion.

Course Schedule		
Week	Wednesday class	Thursday class
1	Jigsaw jumpstart to the curriculum.	Prep for fishbowl. Focus on mathematical communication. What is a rich learning task?
2	Fishbowl Event	Remind RE fishbowl due date. Discuss fishbowl event. Prep for Show and Tell assignment

		Structures, differentiation, and how these can help teach mathematics.
3	Questioning and answering.	Show-and-Tell presentations
4	MONDAY -Show-and-Tell assignment feedback due. Organizations and third party resources.	Show-and-Tell – write up due. Bring your laptop – Brief overview of graphing calculators, geometer sketchpad, and geogebra.
5	Teaching tools – Calculators. Bring a calculator if you own one.	Interoperability. Bringing together technologies for a single coherent picture – bring your laptop.
6	Locally developed?	Assessment and evaluation. Assignment 3 due by 8pm.
7	“Variations on a theme” due. Enrichment – how can we encourage talented students?	EQAO grade 9 focus.
8	Graphic organizers.	Coordinate geometry – intermediate focus (will also be visited in senior course)
9	Assignment 4 due. Issues in mathematics education.	Course evaluation. Where does “intermediate” meet “senior”? Transitions in the school system.

Evaluation: All evaluations are to be submitted electronically unless there are extenuating circumstances requiring the use of a hardcopy. For electronic submissions, please use a file name in the format (last name)-(course), for example, Smith-4466. Please consider that I get a high volume of assignments from multiple courses and sections. It is appreciated if I can simply download your assignment without having to modify the filename. 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 is 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+. 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 four assignments:

1. “Welcome to the Fishbowl” A fishbowl refers to activities where there are two groups with one being actively engaged and the other group monitoring. In this task, you will be assigned to a group of approximately six people. The group will decide on an 8-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 ten-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 of week 2 (Sept. 10).

Please recognize that the ‘event’ emphasizes thinking in the moment and does not have much planning. This is intentional and ultimately helps with self-efficacy but it also provides a lot to talk about in the write-up you do about the event. So, you should approach this being aware that the situation is not amenable to ideal teaching and that it is the subsequent analysis of what happens in less than ideal circumstances that is ultimately important.

After the event, write up a series of reflections on the different roles you played in the exercise. Note that you are writing up about all the fishbowls 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. Write up is due Monday 9am of week 3 (Sept. 15) . (Value 20%)

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. “Show-and-Tell” The objective of this assignment is to present and explain a math artefact or teaching method. This may be a rich learning task, an example application of a technique from the Think Literacy: Subject Specific Examples 7-9, or a specific technique for teaching a math topic (Examples: concept attainment, cooperative learning, deBono’s six hats, discussion etiquette, fishbone, four corners, interviewing, jigsaw, placemat, round table, say and switch, think-pair-share, Venn diagram, walk about). You are asked to sign up for a topic in advance to avoid too much duplication.

A) Walk through the technique in our classroom on Thursday of week 3 (Sept. 18). This is a 10 minute explanation, to a group, demonstrating the artefact or teaching method. You can allocate students to roles for the purposes of demonstration. Note that more than one person will be presenting at a time and peer evaluation will be used. Peer evaluation will use the guide that follows. Note that comments are to be professional and should be in the style of a positive observation, an area for improvement (stated diplomatically) and a ‘next step’. Peer evaluation and comment quality (assessing the writer) will be used with a weighted average. You will be required to use the template provided after the table below to email your report card comments to the instructor by Monday, 9am, of Week 4 (Sept. 22). (Value 10%)

This table is to assist you.

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 effective was the explanation?					
How confident are you that you can implement the technique? (from write up and presentation)					
“Report Card” Comment:					

The template for submitting marks is as follows:

Comment for email “Marks 4466-2A”

Marks are to be submitted in an attached spreadsheet (if this is a problem then embed the following in an email) with one line per student you are evaluating. Each line is to have the following cells:

(last name)(rubric mark for how effective)(rubric mark for confidence) (comment)

Suggestions: Please use “5” instead of “4+” to make it easier to process. There is benefit in typing your comment in a word processor that has spell checking and then cut and pasting. It is also appreciated if you minimize any formatting (borders, colors, fonts, etc.) in the spreadsheet.

B) You will write a two to four page summary of your technique that can be shared with this class. Please begin your summary with a brief, one paragraph, synopsis to help your colleagues determine suitability when they are planning. The summary must acknowledge any sources that are used and it must be your own explanation in your own words. Your summary is to be posted on BlackBoard by 9:00am on Thursday of Week 4 (Sept. 25). (Value 15%)

Note that the intention is that the write-ups can be used as a resource during the practicum.

Criterion	4+ (90-100)	Level 4 (80-89)	Level 3 (70-79)	Level 2 (60-69)	Level 1 (50-59)
Synopsis	A succinct, polished, statement about suitability of	A concise but highly effective version of Level 3.	Allows a teacher to determine suitability.	Indicates suitability for many circumstances.	Synopsis is not sufficient for determining is method is

	the technique.				suitable.
Level of detail	Level 4 with an effective referral to additional material to grow the technique.	All necessary details are provided as well as sufficient details on some variations.	The level of detail makes it clear how the method works.	It is clear how the method works but some details are not sufficiently clear.	It is not clear how the technique works.
Implementable	Can be applied, advice on difficulties and what can be done to go beyond basic implementation.	Level 3 and includes advice on potential difficulties.	Method is sufficiently clear to be applied.	Some aspects of the method are not sufficiently clear for implementation.	Errors or omissions make successful implementation doubtful.

3. “Variations on a theme” In this assignment you will create a pair of lesson plans that teach the same content but in two very different manners. The lessons need to be planned for 50 minutes with timing estimates included. Evaluation will consider each lesson plan individually and also the distinctiveness of each. For the latter, include an explanation (1-2 pages) of the pros and cons of each lesson. What would help you determine which you will use in particular circumstances. Both part A and B are due October 30 by 8:00pm.

A) Effectiveness of each lesson plan (Value 20%)

B) Comparison of two lesson plans (Value 10%)

Criterion for Effectiveness (part A)	4+ (90-100)	Level 4 (80-89)	Level 3 (70-79)	Level 2 (60-69)	Level 1 (50-59)
Content	Appropriate, anticipations, accommodations and enrichment provided in a realistic fashion.	Level 3 with some anticipations or accommodations considered.	Appropriate to the course.	Lesson has limitations in terms of content coverage.	Not clear what the specific content goal is.
Timing	Level 4 in a manner that addresses accommodations and enrichment.	Timing is reasonable, as is homework allocation.	Timing is reasonable for the content.	Too little or too much time for the amount of content.	Significant issues with timing, such as not specifying amounts.
Variety	Level 4 with due consideration of all aspects of the students.	Instruction varies in a manner that flows making transitions more natural.	Different instructional techniques are being used.	Two or fewer instructional techniques.	Not clear that variations in instructional techniques are being used.
Ease of Use	Level 4 but also with tiered elements available.	Lesson plan can be implemented successfully and includes all necessary master copies (may exceed four pages).	Lesson plan can be implemented successfully.	Some details are likely to cause difficulties when using the lesson plan.	Significant details are needed to make the lesson plan effective.
Criterion for Comparison (part B)					
Contrasts	Level 4 with an overall rationale for the flow of each lesson.	The two lessons are genuinely unique.	The two lessons are largely different.	Major overlap in the lessons.	Few differences between the two lessons or it is unclear.

Comparisons	Level 3 but also includes significant considerations of accommodations, enrichment and homework.	Level 3 but also includes some considerations of accommodations, enrichment or homework.	Differences are considered with the classroom in mind.	The comparison is not realistic to the classroom environment.	Limited amount of comparison of the two lessons.
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4. “Help the profession”

Access to a particular resource will be provided. That resource has many years of math teaching material. The task is to create a scavenger hunt style collection of articles that demonstrate the versatility of the resource to address all strands for grade levels 4-10. This task may be completed with a partner.

The result of the task should be a table that details grade and strand with the article reference (APA format) and an explanation of how the content of the article fits with the grade and strand. Grading will be based on 7 articles at 3% each for the quality of connection made to the curriculum, 2% for a balanced selection of dates (i.e. old to recent), 2% for developing your scavenger hunt with additional considerations of your own choosing (Perhaps the authors reflect all of the geography of the Province? Perhaps the articles have a theme of cross-curricular connections?)

Note that the intention is to make the scavenger hunts available publically in anonymous form. If this is a concern, please see me.

(25%, due 9am Dec. 10)

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 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 template on the internet but develop a new lesson using the template, you should include a statement that provides the URL for the template. (Note: submission of a third party lesson 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 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 (see www.oct.ca/standards for the professional standards of teaching). 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, and in keeping with the Foundations of Professional Practice as found on the website for the Ontario College of Teachers.
5. 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.
6. Students are responsible for keeping back-up copies of all written work and assignments for this class.
7. All of the components for evaluation must be completed in order to gain the credit associated with this course. 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 4 percent per calendar day (including both weekdays and weekends) will be assessed on all late assignments. In view of the use of calendar days, if a late assignment is not being handed in electronically then an email indicating the availability of the hardcopy is required.

Additional Information:

Please refer to 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>

For appeals unrelated to academic dishonesty, please refer to the Student Appeals Committee guidelines - <http://www.nipissingu.ca/calendar/regulations/academic/Pages/Student-Appeals-and-Petitions.aspx#appeals>

Students who require additional services and accommodations in class and for exams are encouraged to self-identify with disability services at the beginning of the term so that accommodations can be made to meet the students' needs. All accommodations are arranged through Disability Services, not by the course instructor. Please refer to the Disability Services site for more information and forms - <http://www.nipissingu.ca/departments/student-development-and-services/disability-services/Pages/default.aspx>

The university attendance policy is found at the following link:
<http://www.nipissingu.ca/calendar/regulations/academic/Pages/Attendance.aspx>

The grading policy is found at the following link:
<http://www.nipissingu.ca/calendar/regulations/academic/Pages/Evaluation-and-Grading-System.aspx>