COURSE PURPOSE AND OBJECTIVES

Have you ever thought about the reading that you do as a math major at the university? Is reading for your mathematics courses the same as the reading that you do for science courses? History courses? English literature courses? If yes, what makes the processes the same? If not, then how are the processes different? Do you read numbers, words, symbols? What kind of writing do you do? Where and when did you learn to read the way you read and write in your mathematics courses? How much does your reading intersect with your doing of mathematics? Has the reading always seemed easy to you? Has it always been easy to write the way your professors expected you to write? What, indeed, do you know about the reading and writing processes, regardless of content?

These are not idle questions: The purpose of this course is to teach you about reading and writing within mathematics and to examine both the possibilities and challenges for students as they use and produce texts in mathematics of middle and high schools. Of course, the purpose doesn’t end here. I also want to acquaint you with information about reading and writing processes—especially those that are important for reading in the mathematics—and with pedagogical approaches that help students use texts to learn and become critical readers of mathematics, both in school and in the everyday world.

Please think of this course as a course on using reading, writing, and other communication tools in the service of learning mathematics. Influential teachers—those who hope to make a difference in young people’s lives—acknowledge that all subject areas include some form of communication, and that literacy—or reading and writing of written texts—is one important communicative form in any content area. Influential teachers also recognize that these various forms of communication, including literacy, influence their students' current and future academic, work, social, and political lives. Part of being an influential teacher, then, is a commitment to helping students use and improve on multiple communication abilities both within and outside of your particular subject matter area.

To these ends, we will examine theoretically grounded and empirically supported instructional methods that: (a) assess and prepare students for reading, writing, discussion, interpretation, and critique; (b) help students become strategic readers and writers of content-area concepts; (c) help students comprehend new material and concepts; (d) encourage students to write to learn; (e) draw on and extend in- and out-of-school literacy practices; (f) allow teachers to analyze, critique, and use textbooks and other print materials to meet their students' diverse interests and needs; and (g) assess students' literacy growth and their needs for additional development, and use assessments to plan next instructional moves. At the end of this course, you should be able to do the following:

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1 I have constructed this course with the collaboration of Elizabeth Moje, Bob Bain, Darin Stockdill, Julie Learned, Deanna Birdyshaw, Enid Rosario-Ramos, and Emily Rainey. I am most grateful to them for sharing their course design ideas, syllabi, and insights.
1. Clearly state and critically assess your own beliefs about literacy and learning in your content area, especially in relation to current policies regarding adolescent and mathematical literacy.

2. Explain the nature of and relationship among literacy processes and practices such as reading, writing, discussing, interpreting, and critiquing and explain how these processes and practices relate to thinking and learning in your discipline.

3. Explain how the following concepts relate to the growth of critical literacy skills, strategies, and practices among adolescent students in your content area:
   a. text structure, organization, and considerateness;
   b. comprehension and interpretation of text;
   c. strategic literacy abilities and metacognition;
   d. pedagogical frameworks;
   e. technical vocabulary and concepts;
   f. social interaction and discussion;
   g. students’ and teachers’ beliefs about and experiences with reading, writing, discussion, interpretation, and critique;
   h. the intersection of academic and social or cultural literacy practices;
   i. the cultural, historical, political, and social context of secondary schools and society.

4. Analyze different kinds of texts you might use in your content area by addressing the challenges they will present to students across a variety of dimensions.

5. Demonstrate an understanding of how good teachers plan by describing how you will consider the contexts in which you will teach, the readers and writers you will be teaching, and the texts you’ll be expecting students to read, write, and speak.

6. Plan lessons that integrate mathematics literacy instruction into the overall mathematics curriculum.

7. Teach and assess your own mathematics lesson.

8. Assess student products for the purposes of evaluating students’ growth, determining areas in which students need to continue developing, and planning next steps in your own instruction.

**COURSE THEMES**

Over the course of the semester, we will examine four themes related to the idea that literacy is a part of all teaching and learning:

- **What is literacy? What is literacy in mathematics and mathematics classes?**
  This tends to be more theoretical and we will do a lot of work around what it means to read and write as a mathematician and as an everyday person reading math-related texts. First, how many of you have thought about and seriously studied what goes on in the mind as one reads? Have you thought about how social and cultural trends and practices shape the ways people read and write? We’ll spend some time learning what the past 100 years of reading and writing research have taught us about general reading processes. Then we’ll turn to the question of what it means to read or write in a discipline. How many of you have ever thought about what it means to read like a mathematician? We’ll read articles by some of our own faculty members here at the University of Michigan to explore this question and we’ll discuss how the ideas you learn in relation to literacy will connect to the ideas you will learn in your mathematics methods course next semester. In addition, we’ll discuss how the different texts you might use to teach mathematics could present unique challenges to your middle and high school students.
• How do literacy practices in mathematics classrooms reflect and reproduce social, cultural, and structural arrangements outside of school?

This theme relates to ED 392 (Schooling in a Multicultural Society), as we examine how literate practices are tied to culture, race, class, gender, etc. and how schools privilege certain kinds of literate practices. In particular, we’ll look at how language use and literacy learning in mathematics reflects and reproduces certain ways of using language and literacy in society. We will also read an article that discusses how the social and economic structures of schools shapes access to textual resources, and then learn how to examine texts, adapt them for classroom purposes, and develop strategies to help students make sense of texts.

• Who are your students? Who are you as mathematics and literacy teachers? How does one plan instruction that draws from and extends students’ prior knowledge and experiences?

Here we want to carefully examine our own beliefs about teaching, learning, our disciplines, and the kids we might teach. This theme will foreshadow some ideas that you’ll learn next semester in ED 391 (Educational Psychology) as we think about educating the whole person, rather than simply teaching mathematics. In our discussions, however, we will zero in on literacy practices that young people engage in outside of mathematics classes and, indeed, outside of school. We will also examine how their beliefs about literacy, mathematics, and themselves may shape their motivation to learn mathematics and their engagement in your classes. We will use the school and student studies that you will complete (see details in a latter section of the syllabus) to ground these discussions in actual people’s lives and experiences. It would be great if you could all be moving into data collection for your student studies by the time that we begin to discuss this theme, even if you haven’t completed your student study by this time. Our goal here will be not only to learn about who students are, but to think about how to draw from the knowledge, interests, and experiences they bring to the classroom to engage learners and to set purposes for mathematics learning, reading, and writing.

• What are some ways to teach students to read and write content (mathematics) effectively?

This is all about literacy teaching routines and strategies that you can use in your mathematics classrooms. We’ll explore three approaches to instruction (cognitive, sociocultural, and critical) that are based in theory and research about how people learn and about how schools work, as well as two instructional frameworks (Before-During-After; Integrated Reading and Writing Instruction), and multiple routines and strategies for guiding students’ reading and writing of texts. These routines and practices help teachers elicit and draw from what adolescents already know and care about as ways to engage their students in learning mathematics concepts; set purposes for reading, writing, and learning in mathematics; and focus on studying concepts, rather than discrete facts. All of these routines and strategies are designed to be integrated into mathematics lessons so that they not only support students who may struggle with reading and writing but also teach young people how to read and write as members of the disciplines do. You’ll learn how to plan lessons and you’ll get a chance to plan two and teach some or all of one in your field classroom.
COURSE REQUIREMENTS

The following is a list of course requirements. Detailed guidelines and evaluation rubrics are available on CTools.

PARTICIPATION:
You are expected to attend each class session. In accordance with UM policy, your absence due to religious holidays, medical reasons (with a doctor’s note), or family emergencies will be excused. All other absences will be unexcused and will negatively impact your grade. Regardless of the reason for your absence, you must notify me via email prior to the class if you cannot be in class and you must make up all missed work. If you cannot be present for a class session, let me know as soon as you know that you will be absent, but no later than 2 hours before class begins.

Acceptable absences for religious holidays: please let me know at the start of the semester or at least two weeks in advance if you will miss class for this reason. While it will not be possible to recreate a missed class, please make arrangements with me to complete alternative work that will support the learning you missed. I will specify the due date for this alternative assignment. More than two absences from the class will make successful learning of the material in the course challenging and put you in danger of not being able to complete the course successfully. The Teacher Education Office will be notified if there are more than two absences. Three absences—excused or unexcused—are grounds for failing this course, and more than one unexcused absence may result in a failing grade.

Our class will build on readings, discussions, in-class demonstrations and deconstruction of strategies, your knowledge of schools, and your personal and collaborative reflections. As a result, your participation in our class activities is important not only for your own learning, but also for the learning of others in the class. Thus, I will also evaluate your participation in class. Participation can take many forms. I will evaluate you holistically across these categories to determine whether you have earned the five points for each session:

- Regular attendance
- Thoughtful, prepared, and courteous participation in whole- and small-group activities (including evidence of having completed readings)
- Collaborative work with your field partner and other small groups in the class

Regarding personal technology use:
Appropriate use of electronic devices is a part of your professional participation in our class. Using laptops or cell phones as tools for your learning is acceptable, as long as it is not distracting to you, your colleagues or your instructor. Examples of acceptable use of electronic devices include making records of your practice and consulting resources for work in class. Non-instructional texting, phone calls, social networking, shopping, and other non-instructional use of these devices during class is unacceptable, and will result in a reduction in your participation grade. If you are concerned about your ability to meet this professional expectation, please discuss your concern with me. Please let me know if there is an emergency that affects your need for using a phone during class time.

Remember, this is a professional course as well as an academic course. As part of course participation you should be demonstrating that you are learning and applying professional standards generally expected of educators in matters of timeliness, personal presentation, and general conduct. These standards may be different from the norms of university student culture in general.
Accommodations

**Accommodations for Students with Disabilities:** In accordance with University of Michigan policy, I am happy to provide accommodations for students with learning disabilities and will protect the confidentiality of students’ individual learning needs. Please email me by the second week of the term so I can schedule a confidential appointment to discuss approved accommodations.

**For other special circumstances:** If there are extenuating circumstances that impact your success, please contact me ASAP to schedule an appointment.

**READINGS:** You are expected to read all assigned readings and participate in discussions or activities for which the readings serve as a springboard. You will be expected to integrate aspects of readings into your major assignments.

**SCHOOL/TEXT/STUDENT STUDIES:** You are expected to fully contribute to the completion of a series of team projects based in your field placement sites. I have provided rubrics with guiding questions to complete these studies. The guiding questions mirror those on the assessment that you will take at the end of the term. These rubrics can be found on our CTools site, under the labels SCHOOL STUDY, TEXT STUDY, and STUDENT STUDY. I have scheduled your reports of these studies to be due throughout the semester so that we can discuss them in class and in Practicum, so you need to begin working on the first part (SCHOOL STUDY) immediately.

**School Study:** You will study your placement school and the community it serves, trying to answer questions related to your school, department, teachers, departmental goals, and the interaction between your school and the community. The School Study will be mostly represented as an in-class discussion/presentation. Preparation will count toward your participation grade.

**Text Analysis:** This assignment will give you the opportunity to conduct an in-depth examination of the number and nature of texts available and routinely used in your field placement classroom. You will also address the demands those texts place upon students as readers and writers.

**Student Case Study:** For this assignment, you will use your practicum experience to observe literacy practices of secondary school teachers and adolescents at work. Your task is to get to know a young person in your school setting as both a student and a person. You’ll use field notes, interviews, and several assessments to complete the assignment. The purpose for the field work is twofold: first, to increase your understanding of the challenges faced by adolescents in learning content area material; and second, to situate the teaching that you plan to do among real students and real colleagues. (Note: You should start asking students if they’ll let you “study” them immediately. When you ask them, you should clarify that you are not doing a research study; rather, you are studying them as a way of helping you learn how to be a teacher. You can also start developing your instruments before it is time to administer them.)
LESSON PLANS and TEACHING: You will plan 1 mathematics LITERACY lesson. We will spend class time to plan and rehearse parts of your lesson, and then you’ll teach the lesson in your field site. This should be a lesson that you would normally teach in mathematics. The literacy piece is not meant to be an additional activity. Instead, you will demonstrate in your planning that you have:

- analyzed the texts that you would want your students to read or write
- developed a lesson that will not only use these texts, but also teach them how to read and write in the ways you expect
- included a method for assessing whether students have successfully read and/or written the texts you’ve included/assigned.

You will teach at least one time in your practicum field classroom. Your teaching can take many forms (a one-on-one session with a student, a small group, a whole class, field trips, lectures, showing and discussing a film, carrying out a simulation, etc.) You will work with your field instructor and your Mentor Teacher (MT) in the field to decide when, what, how, and whom you will teach. You will also work with your Practicum partner to coordinate the teaching so that you can help each other.

At least one of the teaching experiences you have must be based on your planned literacy lessons. You may, however, teach more than one time, and you can document any of your teaching experiences, as long as the teaching involves SOME ASPECT OF LITERACY INSTRUCTION in mathematics.

In addition to the actual teaching, you are required you to videotape your teaching. You may use your own equipment, or you may use video equipment from the Brandon Center, but you need to reserve this equipment ahead of time. You should be sure that the equipment is charged and ready to go when you are.

TEACHING ANALYSIS: After you have taught a lesson or part of a lesson during your practicum, you will write an analysis about your teaching experience. The analysis will include a brief summary of the lesson plan, a description of what actually happened, and a reflection about what you have learned and how you may use this knowledge in future teaching experiences.

LITERACY TEACHING PHILOSOPHY: Throughout the semester you will develop a stance on your responsibilities as an educator with regard to literacy in ELA. You will craft a concise, research-based philosophy statement that represents your perspective and commitments. You may draw upon this document later in your certification program as you write a final Teaching Philosophy to be included in your teaching portfolio for job applications.

COURSE MATERIALS REQUIRED

- All course materials are available on CTools.
EVALUATION

Grades will be assigned on the basis of both process and product. Revisions of will be accepted for ONE WEEK after the work is returned to you. When submitting a revised assignment, highlight your revisions in the document.

Late work will not be accepted. Your work will not be accepted if you are not in class on the day that it is due unless you have made special arrangements with me before class.

Your grade will be calculated as follows:

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Point Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class participation</td>
<td>100</td>
</tr>
<tr>
<td>School Study (counted in participation grade)</td>
<td></td>
</tr>
<tr>
<td>Text Study</td>
<td>100</td>
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<tr>
<td>Student Study</td>
<td>75</td>
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<tr>
<td>Small Group/Whole Class Lesson Planning/Rehearsal (counted in participation grade)</td>
<td></td>
</tr>
<tr>
<td>Lesson Plan and Reflection</td>
<td>100</td>
</tr>
<tr>
<td>Literacy Teaching Philosophy</td>
<td>50</td>
</tr>
<tr>
<td>TOTAL</td>
<td>425 POINTS</td>
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</tbody>
</table>

The grading scale is:

- 100-94 A  76-74 C
- 93-90 A-  73-70 C-
- 89-87 B+  69-67 D+
- 86-84 B  66-64 D
- 83-80 B-  63-60 D-
- 79-77 C+  59-0 F
<table>
<thead>
<tr>
<th>WEEK/DATE</th>
<th>TOPICS</th>
<th>READINGS TO BE DONE PRIOR TO CLASS</th>
<th>ASSIGNMENTS DUE AT THE BEGINNING OF CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Sept. 3</td>
<td>What is literacy? What is the purpose of literacy teaching and learning? In general? In the disciplines?&lt;br&gt;&lt;br&gt;Activities:&lt;br&gt;• Introductions&lt;br&gt;• Syllabus review&lt;br&gt;• Overview of literacy</td>
<td>Shanahan, T., &amp; Shanahan, C. (2008).&lt;br&gt;Lee, C., &amp; Spratley, A. (2010). Reading in the disciplines.&lt;br&gt;• pp. 2-20; skim, don’t skip, through 4-11 “Reading in...” the other content areas&lt;br&gt;Read over the Syllabus and School Study Guidelines closely and take note of any questions you may have.</td>
<td>Be prepared with questions about school study or syllabus.</td>
</tr>
<tr>
<td>3 Sept. 17</td>
<td>What is disciplinary literacy in math?&lt;br&gt;How is knowledge produced through literacy in math?</td>
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<td></td>
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<tr>
<td>Date</td>
<td>Topic</td>
<td>Reading/Study Material</td>
<td>Note</td>
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<tr>
<td>5 Oct. 1</td>
<td>What is the role of text in mathematical literacy? What are features of texts that can challenge young readers? How do texts provide learning opportunities for young readers?</td>
<td>Wade, S.E., &amp; Moje, E.B. (2000) CCSS Text complexity measures Samples from math textbooks (to be provided) Text Study Guidelines</td>
<td>Be prepared with questions about text study</td>
</tr>
<tr>
<td>6 Oct. 8</td>
<td>Knowing some math literacy demands, what are some strategies that educators can use to support students with these demands? Rachel Snider visit</td>
<td>Mathematical Literacy Book (the included pages on CTools) Skim <em>Reading for Understanding</em> Chapter 7 Optional: <a href="http://www.litandlearn.lpb.org/strategies.html">http://www.litandlearn.lpb.org/strategies.html</a></td>
<td>Choose 1 strategy you've read about and be prepared to teach the class about it using a mathematical example. Math PCK questions</td>
</tr>
<tr>
<td>7 Oct. 15</td>
<td>How do students experience school? How do we help students build reader/writer identities? How do we help students navigate between their everyday and academic lives? Justin Dimmel visit</td>
<td>GeroFSky (1996) Moje book • Skim Ch. 1; Read Ch. 3 and 4 Briefly look over Literacy Motivation Questionnaire</td>
<td>Text Study Due. Submit on CTools (last name TextAnalysis.doc).</td>
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<tr>
<td>Date</td>
<td>Topic</td>
<td>Readings</td>
<td>Other Notes</td>
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<tr>
<td>8 Oct. 22</td>
<td>What matters about the reader? What are students’ knowledge, perspectives on, and experiences with literacy and learning? How can we imagine different types of readers? How can we anticipate text challenges and provide instructional support to students?</td>
<td>Alexander, P. (2005) • pp. 426-432 Pearson Ch. 1, pp. 11-18, 23-29</td>
<td>Skim Content Reading Inventory instructions&lt;br&gt;Revised Text Study due. Submit on CTools (last name_ TextAnalysisREV.doc).</td>
</tr>
<tr>
<td>10 Nov. 5</td>
<td>How can we collect student data to make instructional decisions? How do we know when our teaching was effective? What are the affordances and limitations of various assessment methods?</td>
<td>Wiggins, G., &amp; McTighe, J. (1998). • pp. 7-19 Miller, P., &amp; Koesling, D. (2009).</td>
<td>BallBassTowardAPracticeBased&lt;br&gt;Student Study Due. Submit on CTools (last name_ StudentStudy.doc).</td>
</tr>
<tr>
<td>Date</td>
<td>Event</td>
<td>Reading and Writing</td>
<td>Video/Website</td>
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</table>
| 12 Nov. 19 (formerly Nov. 12) | What are the roles of communication and metacognitive conversations in teaching all students?  
*Reading for Understanding* Book: pp. 101-107  
Watch video of Think Aloud in science. It’s a slightly different approach than the one in the book: [http://www.youtube.com/watch?v=vJ_ae40TgN4](http://www.youtube.com/watch?v=vJ_ae40TgN4)  
Create a short think aloud. | Revised Student Study Due. Submit on CTools (last name_StudentStudyREV.doc). |
| 13 Nov. 21 (formerly Nov. 19) | What are the Common Core Standards for math? What do they require of students with regard to literacy?  
Pugalee (2001)  
**Skim** Using writing in mathematics document  
Math Common Core State Standards  
• p. 4 “Understanding Mathematics”; pp. 6-9  
“Standards for mathematical practice”  
Contribute to reading guide | |
| 14 Dec. 3 | No Class: Study Day. Work on a draft of your teaching philosophy. | | Lesson Plan Due on December 1. Submit on CTools (last name_LessonPlan.doc). |
What does it take to teach HS math?
What should teachers know and know how to do?
What should educators know about research and policy?
What did you learn? How will your conclusions inform your future teaching, teaching philosophy, and other coursework?

Skim Pearson Ch. 1, pp. 1-10
Borasi and Siegel: Reading Map
Jigsaw:
Olsen & Truxaw

Bring in draft of teaching philosophy for workshop

Literacy Teaching Philosophy Due date December 16 @11:55pm. Submit on CTools (last name_ TeachPhilosophy.doc).

Bibliography


Donahue, D. Reading across the great divide: English and math teachers apprentice one another as readers and disciplinary insiders. *Journal of Adolescent & Adult Literacy, 47*(1), 24-37


