



TTE 524 <https://arizona.zoom.us/j/653704797> 4:15PM-6:45 PM Tuesdays

Teach Arizona Math Methods - Fall 2017

Instructor: Melissa Hosten

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"Even on her/his worst day, a teacher changes lives for the better"

Course Description: This course will focus on current issues in mathematics education and their application to classroom instructional practices and procedures. Topics will be based upon recent concerns and developments in the field of mathematics education. The course is designed to provide you with knowledge and experience to assist you in becoming an effective secondary mathematics teacher. Emphasis will be on modes of instruction, engaging students in discourse and active learning, use of technology, effective assessment, recent research and national standards. Special attention will be given to teaching with understanding and learning to enhance student's appreciation and enjoyment of mathematics. You will extend your professional knowledge and develop the skills and dispositions necessary to meet some of the national standards for teachers:

- The InTASC Standards
http://www.ccsso.org/Documents/2013/2013_INTASC_Learning_Progressions_for_Teachers.pdf
- The ISTE NETS-T Standards http://www.iste.org/docs/pdfs/20-14_ISTE_Standards-T_PDF.pdf

Meeting Time and Place: We meet over Zoom: (<https://arizona.zoom.us/j/653704797> Tuesdays 4:15 to 6:45 PM. Observations in middle and high schools on selected afternoons—time varies.

Office hours: Gould-Simpson room 831 Tuesdays from 12:30 to 1:30 or by appointment.

Required Textbooks:

Boaler, J.(2015) *Mathematical Mindsets: Unleashing Students' Potential through Creative Math, Inspiring Messages and Innovative Teaching.*
Jossey-Bass (Penguin).

Stigler, J. and Hiebert, J. *The Teaching Gap: Best Ideas from the World's Teachers for Improving Education in the Classroom.* The Free Press.

National Council of Teachers of Mathematics. (2014). *Principles to Actions: Ensuring Mathematical Success for All*

Required Websites: <http://illustrativemathematics.org>, <http://www.corestandards.org/the-standards/mathematics/>, <http://www.nctm.org>, <http://www.azed.gov/>

Readings from easily accessed (or provided) journals, books and websites will also be assigned.

Course Objectives and Goals

| The learner will... | Standard |
|---|---|
| name, describe, identify and use different modes of instruction and know when each might be appropriate. | INTASC 1 (b), (d), (e), (h), (i), 2 (a), (b), (g), (h), (j), 3 (b), (c), (d), (e), 7 (b), (c), 8 (a), (b), (e) |
| recognize the importance of student active classrooms and be able to achieve this goal in their own classroom. | INTASC 1 (d), (e), (h), (i), 2 (a), (b), (g), (j), 3 (b), (c), (d), (e), 7 (b) |
| develop effective lessons and lesson plans showing student active learning and taking into account different learning styles and differentiation of instruction. | INTASC 1 (b), (d), (e), (h), (i), 2 (a), (b), (g), (h), (j), (l), (m), (r), (o), 3 (b), (c), (d), (j), 7 (b), 8 (a), (b), (e) |
| understand, appreciate and be able to integrate the use of computers and calculators into the secondary curriculum. | INTASC 3(g), (h), (m), 4 (g), 8 (g) ISTE NETS-T Standard 2(a), (b), (c) |
| use the Internet to find lessons, teacher materials and applicable research including lessons with technology. | INTASC 3(g), (h), (m), 4 (g), 8 (g) ISTE NETS-T Standard 3 (a), (d) |
| know how to assess students' progress not only to assign grades, but also to monitor and improve instruction. | INTASC 1 (a), 6 (a) – (v), 7 (d), ISTE.NETS-T Standard 1 |
| teach students with various learning styles utilizing many tools such as cooperative learning, hands-on activities, writing for understanding and every day assessment. | INTASC 1 (b), (d), (e), (h), (i), 2 (a), (b), (g), (h), (j), (l), (m), (r), (o), 3 (b), (c), (d), (j), 7 (b), 8 (a), (b), (e) |
| Write a lesson plan and then teach an exemplary student-active lesson utilizing teaching for understanding, formative assessment, and good questioning techniques, that is accessible to all students with extensions for those who can go farther. | In TASC 1-9 |

Classroom Expectations

- **Listen and contribute**—Everyone has important things to contribute and sharing has to be the way of life for a successful teacher.
- **Ask Questions**—Participate fully and let me know if we need to cover something in more detail.
- **Work hard**—You get out of life what you put into it. Please use this chance to “Get your money’s worth!)
- **Rediscover your love for math**—You like it, now try and remember why so you can recreate that feeling in **your** class.
- **Connect**—Try to connect what you learn in this class to the classes you observe and to your general methods class. *Find out what makes a great class great!*
- **Be there every time and on time**—This is what you want from your students, so you should expect it from yourself.

Attendance: Every class is important and you are expected to be there every time we meet. Excessive absences may result in a failing grade. If possible, as a matter of courtesy I would appreciate a telephone call or email notification in advance of any absence.

The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at: <http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop>

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, <http://policy.arizona.edu/human-resources/religious-accommodation-policy>.

Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: <https://deanofstudents.arizona.edu/absences>

Participating in the course and attending lectures and other course events are vital to the learning process. As such, attendance is required at all lectures and discussion section meetings. Students who miss class due to illness or emergency are required to bring documentation from their health-care provider or other relevant, professional third parties. Failure to submit third-party documentation will result in unexcused absences.

Classroom Policies: Please be on time. Please turn off mobile phones prior to the start of class.

Accessibility and Accommodations: Our goal in this classroom is that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact the Disability Resource Center (520-621- 3268) to establish reasonable accommodations. For additional information on the Disability Resource Center and reasonable accommodations, please visit <http://drc.arizona.edu>. If you have reasonable accommodations, please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate. Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

Course Communication: Please contact me through my email at mhosten@math.arizona.edu or if a response is required immediately, please call my mobile phone at 520.390.2344

Threatening Behavior Policy: The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself. See <http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>.

Code of Academic Integrity: Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See: <http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity>.

The University Libraries have some excellent tips for avoiding plagiarism, available at <http://www.library.arizona.edu/help/tutorials/plagiarism/index.html>. Selling class notes and/or other course materials to other students or to a third party for resale is not permitted without the instructor's express written consent. Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA e-mail to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student e-mail addresses. This conduct may also constitute copyright infringement.

UA Nondiscrimination and Anti-harassment Policy: The University is committed to creating and maintaining an environment free of discrimination; see <http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>. Our classroom is a place where everyone is encouraged to express well-formed opinions and their reasons for those opinions. We also want to create a tolerant and open environment where such opinions can be expressed without resorting to bullying or discrimination of others. Instructors and students will use names and pronouns as requested, and instructors will update their rosters to accommodate students who modify their names and/or pronouns after course registration.

Additional Resources for Students: UA Academic policies and procedures are available at <http://catalog.arizona.edu/policies> Student Assistance and Advocacy information is available at <http://deanofstudents.arizona.edu/student-assistance/students/student-assistance> Office of Diversity (<http://diversity.arizona.edu/>) <http://www.health.arizona.edu/counseling-and-psych-services> http://oasis.health.arizona.edu/hpps_oasis_program.htm

Confidentiality of Student Records: <http://www.registrar.arizona.edu/personal-information/family-educational-rights- and-privacy-act-1974- ferpa?topic=ferpa>

* Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.*

Class Topics

- What is mathematics?**
- What does good teaching look like?**
- What has gone wrong in classrooms?**
- What is rightside up teaching?**
- What does equity in a mathematics classroom mean?**
- What do we do the first week of school?**
- What makes a good question?**
- Where are quality materials found?**
- How can we motivate students?**
- How should we assess students?**
- What does personalized learning look like?**
- How will our videos help us become better teachers?**
- What can we learn from the Teaching Gap?**
- Is groupwork the same as cooperative learning?**
- What are multi-ability classrooms and do they work?**
- Lesson Presentations**

Course Assignments/Grading Scale

Observation Reports: You will be required to write and turn in an observation reports for class observations. Each time you will be asked to look for something specific, which we will discuss in class ahead of time. In addition, you will write and react to anything that goes on in the classroom that you might want to remember when you begin teaching. **InTASC 1, 2, 3, 8, 9, 10**
80 points total

Videotape of your Teaching with your Reflection: With help from your cooperating teacher you will videotape yourself teaching part of a class in one of your assigned classrooms. The tape and your personal reaction to the tape will be due Nov. 3. **InTASC 6, 7, 9**
100 points

Demonstration Lesson: All semester we will be working towards discovering what makes an outstanding lesson. You will be required to make a lesson plan and teach the class a part of one lesson that is connected to the Common Core Standards. A lesson plan will be due Nov. 21. Each student will have a chance then to revise and enhance the lesson prior to the presentation. There will be attachments to the lesson demonstrating what you have learned in the class this fall. The Final lesson is due the day you teach your lesson to the class, Dec. 5. Details regarding the demonstration lesson assignment can be found in the attachment *Signature Assignment*.

Note Benchmark Assignment – Student must pass this assignment to pass the class.

InTASC 1-10
150 points

Internet Research and Summary: Research of suggested and discovered internet sites with a two-paragraph summary of 5 of them stating what they could be used for and how helpful (or not) you feel they would be to another new teacher. **InTASC 8, 9 ISTE NETS-T 3**
30 points

Professional Teaching Notebook: Throughout the semester you will be collecting articles, lessons, activities and resources from me, from the teachers you observe, and from your classmates. You will need to organize them in an electronic notebook to submit at the end of the semester. Include your observations, professional articles, and lesson ideas from the class and from outside sources. **InTASC 4,5,6,7,8** Due at the time of your presentation.

40 points

In Class Assignments, Reading responses, and Discussions

Class participation, preparation, assigned readings with discussions/quizzes and/or presentations **InTASC 1-9 ISTE NETS-T Standard: 1, 2, and 3**

100 points

Total is 500 points

90 to 100% = A, 80 to 89% = B, 70 to 79% = C

Requests for incomplete (I) or withdrawal (W) must be made in accordance with University policies, which are available at
<http://catalog.arizona.edu/policy/grades-and-grading-system#incomplete> and
<http://catalog.arizona.edu/policy/grades-and-grading-system#Withdrawal> respectively.

Dispute of Grade Policy Grade disputes will be accepted in written format submitted to my official University of Arizona email within one week of the assignment due date (if disputing an individual assignment grade or within one week of the final grade posting (if disputing the final exam or the final course grade).

Recommended Resources:

- Boaler, J. (2008). *What's MATH Got to Do With It?: Helping children learn to love their least favorite subject—and why it's important for America*. Viking (Penguin).
- Common Core Standards for Mathematics <http://www.corestandards.org/the-standards/mathematics/>
- Johnson, D. (1984) (1992). *Every Minute Counts: Making Your Math Class Work* and *Motivation Counts: Teaching Techniques that Work*. Dale Seymour Publications *
- Wong, Harry. (2004). *The First Days of School*. Harry K. Wong Publications, Inc.
- Seeley, C. (2009). *Faster Isn't Smarter: Messages About math, Teaching and Learning for the 21st Century*. Math Solutions.
- Humphreys, C., & Parker, R. (2015). *Making Number Talks Matter: Developing Mathematical Practices and Deepening Understanding, Grades 4-10*. Stenhouse Publishers.
- Schwan Smith, M. & Stein, M. K. (2011). *5 Practices for Orchestrating Productive Mathematics Discussions*. Corwin



TTE 524 -- Current issues in Mathematics Education Signature Assignment

Part 1. Write an outstanding mathematics lesson (in much greater detail than you will do on a regular basis) on a topic of your choice from the AZ College and Career Standards or Common Core State Standards. The lesson will consist of your lesson plans, plus an appendix explaining how your lesson is connected to what you have learned all semester. It is suggested that the topic you choose will be something you will be teaching next semester or something that you saw in the fall semester that you want to improve and enhance. The lesson must have the following components which we will work on all semester in classes and through observations.

A well written lesson plan containing all the parts (opening, lesson itself, student active learning, assessment of learning, closure, materials needed, comments) is the main product. You may use any of the forms we talk about or create your own. You should attach additional pages (appendix) to address the bullets below if they are not obvious in the lesson plan itself.

- Knowledge of the Common Core Standards for Mathematical Practice must be demonstrated.
- The Common Core Standards covered in the lesson must be indicated.
- Student active learning must be an integral part of the lesson
- A sample of questions you will ask to illicit student participation and understanding must be included. These would include questions to the class as a whole, and questions to groups (if you use them) or individual students.
- The lesson must be accessible to all students, including special education students. A paragraph or more discussing accommodations for different types of students—ELL, Learning Disabled, gifted students, etc. must be included on the attached Appendix.
- Different learning styles should be addressed through the use of cooperative learning, discovery or inquiry based instruction, technology, manipulatives, classroom discourse, student presentation, etc. Be sure to include at least two of the strategies we have discussed in your main lesson. This is NOT a lecture lesson.
- Demonstration of your knowledge of curriculum will be shown by a statement indicating what takes place the day (or week) before and how this topic is related to the unit at large.
- Demonstrate collaborative efforts. If you have worked with your cooperative teacher or other professionals or friends in your cohort in planning this lesson or if you have used community resources or the internet please indicate this.
- Facilitation notes used to prepare and to facilitate during the lesson.

Part 2. Demonstrate a part of your lesson that is student active, addresses different learning styles and includes either classroom discourse or use of good questioning techniques for students in groups. This part of your lesson should be 40 to 45 minutes long. Your math cohort and I will be your “students”. Be prepared to defend orally your choice of lesson. You may reference any research or literature we have read as well as the NCTM and Common Core Standards.

- Provide the video from your facilitation to your classroom students.

Part 3. After you teach the lesson to your classroom students and you teach the lesson in this methods class, upload your Reflective Essay with the following components:

- Describe elements of the lesson (both from reviewing your video and from reflecting on the facilitation during your methods class) that were particularly effective and explain why they were effective.
- Describe elements of the lesson (both from reviewing your video and from reflecting on the facilitation during your methods class) that needed improvement and explain what made that part of the lesson less effective than desired.
- Provide specific revisions or additions to the lesson that you intend to make in order to improve the lesson.

InTASC standards covered in the teaching demonstration and rubric are 1,2,3,4,5,6, 8 and 9.

InTASC standard 7 is evaluated by the written lesson plan.

ISTE.NETS-T standards covered are 1, 2, 4

Please note that this is a Benchmark Assignment for this course and students must receive a passing grade on this assignment to pass the course. The assignment will be weighted 50% for teaching, 30% for a detailed lesson plan with appendices, and 20% for a written reflection on the demonstration lesson.

DUE no later than December 5, 2016 at 9 AM

Demonstration Lesson Rubric

Planning:

| Criteria | 4 points | 3 points | 2 points | 1 point |
|--|---|---|---|---|
| Terminal Objective InTASC: 7 | Provides a Terminal Objective that is appropriate for curriculum goals and content standards. The objective specifies both content and behavior. | Provides a Terminal Objective that is appropriate for curriculum goals and content standards. The Objective specifies either content or behavior but not both. | Provides a Terminal Objective with questionable alignment with curriculum goals and content standards. The Objective specifies either content or behavior but not both. | The Terminal Objective does not appear to be aligned with curriculum goals and content standards. The Objective lacks specificity. |
| Language Objective InTASC: 2, 7 | The plan explicitly provides tools of language development including strategies for making content accessible to ELLs. The language objective is clearly stated. | The plan implies tools of language development including strategies for making content accessible to ELLs. The language objective is clearly stated. | The language objective is clearly stated but tools of language development are not evident. | The language objective is unclear or missing. Tools of language development are not evident. |
| Task Analysis InTASC: 7 | The plan includes a series of sub-objectives that appropriately sequence learning experiences, demonstrates a variation in Bloom's level and matches the final sub-objective to the terminal objective. | The sub-objectives may not provide appropriately sequence learning experiences, or demonstrates a variation in Bloom's level. The final sub-objective may not match the terminal objective. | The sub-objectives may not provide appropriately sequence learning experiences. Reference to Blooms level may be inaccurate or missing. The final sub-objective may not match the terminal objective. | The sub-objectives does not provide appropriately sequence learning experiences. Reference to Blooms level is inaccurate or missing. The final sub-objective does not match the terminal objective. |
| Teaching Strategies InTASC: 7, 8 | The plan provides several effective teaching strategies and checks for understanding and demonstrates knowledge of different ways to represent mathematics and make connections. | The plan provides some teaching strategies and checks for understanding and demonstrates knowledge of different ways to represent mathematics and make connections. | The plan provides teaching strategies and checks for understanding but a real understanding and investment in teaching for understanding rather than procedural is not evident. | The plan contains teaching strategies that are more procedural and utilize more memorization than understanding on the students' part. |
| Lesson Materials InTASC: 3 | The plan provides a comprehensive list of materials necessary and all listed materials are attached. | The materials are listed but not all listed materials are attached. | The list of materials is incomplete and or not all listed materials are attached. | The list of materials is incomplete or missing and few if any listed materials are attached. |

Teaching:

| Criteria | 4 points | 3 points | 2 points | 1 point |
|--|--|--|---|--|
| The instructional strategies and activities addressed participants' prior knowledge. InTASC 2 | The student asks questions specifically designed to elicit participants' prior knowledge or engages students in an activity specifically designed to elicit prior knowledge throughout the lesson. | The student asks questions specifically designed to elicit participants' prior knowledge or engages students in an activity specifically designed to elicit prior knowledge at some point within the lesson. | The student appears to make some attempt to elicit prior knowledge but the method used is not specifically designed to do so. | No participant prior knowledge was elicited |
| The lesson involved fundamental concepts of the subject and was at an appropriate level for the students. InTASC 1, 4, 5 | The entire lesson covered content essential to mastery of the subject and was at an appropriate level for the students. | A majority of the lesson covered content essential to mastery of the subject and was at an appropriate level for the students.. | Some of the lesson content was essential for mastery of the subject and/or the level was slightly higher or lower than an appropriate level for the students. | The lesson content was not essential for mastery of the subject and/or the level was not appropriate for the students |
| The lesson promoted strongly coherent conceptual understanding. InTASC 2, 4, 5 | The entire lesson was designed and implemented in a way that targeted a strong understanding of broad concepts rather than discreet facts or minutiae. | A significant portion of the lesson was designed and implemented in a way that targeted a strong understanding of broad concepts rather than discreet facts or minutiae. | Some of the lesson addressed the broad concepts but the majority of the lesson addressed acquisition of discreet facts with little connection to the big ideas. | There was little meaningful content covered and few if any connections to the big ideas were made. |
| The student had a solid grasp of the subject matter content inherent in the lesson. InTASC 4,5 | The student demonstrated complete understanding of every aspect of the content covered and exuded confidence in content knowledge. | The student demonstrated strong understanding of the content and/or exhibited only minor lapses in confidence in content knowledge. | The student demonstrated adequate content knowledge and/or exhibited a significant lack of confidence in content knowledge. | The student demonstrated serious gaps in content knowledge and/or demonstrated a profound lack of confidence in content knowledge. |

| Criteria | 4 points | 3 points | 2 points | 1 point |
|--|--|--|---|---|
| Participants were actively engaged in thought-provoking activity that often involved the critical assessment of ideas. InTASC 3, 5, 6, 8 | The participants were completely engaged throughout the lesson and were involved in thoughtful discussion involving analysis of the lesson material and or metacognition. | The participants were actively engaged for a majority of the lesson and spent some time reflecting on their learning | The participants were engaged for a portion of the lesson and spent little if any time reflecting on their learning. | There was minimal if any active participation or reflection on the part of participants. |
| The teacher used questioning strategies effectively. InTASC 2, 3, 8 | The student used instructional questions effectively throughout the lesson to engage students, check for understanding and guide student learning. The student used questions to elicit additional questions from participants and guided participants toward answering their own questions. | The student used instructional questions effectively at times during the lesson to engage students, check for understanding and guide student learning. The student was the primary source of the questions instead of the participants. | The student occasionally used instructional questions effectively but spent a significant amount of time “telling” rather than “asking.” | The student asked few instructional questions and utilized lecture or “telling” as the primary means of instruction |
| Classroom discourse was focused on the lesson topic and much of the discussion was between and among participants. InTASC 3 | Participants were engaged in meaningful dialog about the lesson content throughout the lesson. | Participants were engaged in meaningful dialogue about the lesson content for much of the lesson. | Participants were engaged in meaningful dialogue about the lesson content for a portion of the lesson. | There was little dialog among students or most of the student dialog was unrelated to the lesson content. |
| There was a climate of respect for what others had to say. InTASC 3 | Dialog was respectful and respected. Participants listened attentively to each other and responded respectfully most of the time. Only occasionally did participants interrupt one another or show minor disrespect. | Participants listened attentively to each other and responded respectfully most of the time. Only occasionally did participants interrupt one another or show minor disrespect. | “Side bar” conversations and other distractions occurred frequently while participants were speaking. Participants were openly critical of comments made by others. | Few rules governing classroom discussion were evident. Participants were often inattentive or rude to classmates. |

| Criteria | 4 points | 3 points | 2 points | 1 point |
|--|---|---|---|---|
| Active participation of participants was encouraged and valued. InTASC 2, 4, 5, 8 | Participants were encouraged to engage with the material and ask questions. Their enthusiasm was rewarded and opportunities for them to explore further or dig deeper were encouraged. | Participants were encouraged to engage with the material and ask questions. Opportunities for students to explore on their own or dig deeper were not encouraged. | Participants' opportunities to actively engage with the material were limited. Activities were very restrictive and did not allow for deeper exploration by participants. | Participants had minimal opportunity to engage with material. Their role was primarily that of spectator. |
| The teacher acted as a resource person, working to support and enhance participants' learning. InTASC 3, 5 | The teacher could best be described as "the guide on the side" by assuming the role of facilitator and helping participants work through the material for themselves. The teacher served as a resource rather than a purveyor of information. The teacher welcomed participants' questions. | The teacher provided many opportunities for participants to make discoveries and draw conclusions for themselves, but occasionally provided information that the participants could have determined for themselves. | The teacher provided much of the information and answers to participants even though the participants could have found this information out for themselves. | Participants were rarely given opportunities to provide input in the learning process. |
| The lesson included the effective use of technology. ISTE.NETS 1, 2, 4 InTASC 3, 9 | The teacher used technology extensively and effectively to engage students and promote student learning. Both the teacher and the students used technology in a legal and ethical manner. | The teacher and students used some technology effectively to engage students and promote student learning. Both the teacher and the students used technology in a legal and ethical manner. | The teacher used some technology effectively. The teacher used technology in a legal and ethical manner. | Little or no technology was used or the technology was used in an inappropriate way. |

Reflection:

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| The student provided a thoughtful reflection regarding the lesson. InTASC 9 | The student provided a detailed, thoughtful reflection to evaluate the outcomes of his/her teaching, to improve planning and practice, and develop relevant learning experiences. | The student provided a somewhat detailed reflection to evaluate the outcomes of his/her teaching and to improve his/her practice. | The student provided a somewhat detailed reflection to evaluate the outcomes of his/her teaching but strategies for improving practice were unclear. | The students reflection lacked depth of thought and/or did not provide strategies for improving practice. |
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