Education is not the filling of a pail, but the lighting of a fire. 
Yeats

This 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.

Meeting Time and Place: Flowing Wells High School, Room 52, Fridays 1 to 3. Observations in middle and high schools on selected Monday afternoons—time varies. Occasionally class may be on Monday and observation on Friday. Office hours: following class at Flowing Wells from 3 to 4 on Friday or by appointment.


Readings from easily accessed (or provided) journals, books and websites will also be assigned. See suggested resources at the end of the Calendar Page. It is suggested but not required that you purchase Stigler, J. and Hiebert, J. (1991). The Teaching Gap: Best Ideas from the World’s Teachers for Improving Education in the Classroom. The Free Press.

Course Objectives and Goals
1. Students will be able to name, describe, identify and use different modes of instruction and know when each might be appropriate.
2. Students will appreciate the importance of student active classrooms and be able to achieve this goal in their own classroom.
3. Students will be able to develop effective lessons and lesson plans showing student active learning and taking into account different learning styles and differentiation of instruction.
4. Students will understand, appreciate and be able to integrate the use of computers and calculators into the secondary mathematics curriculum.
5. Students will be able to use the Internet to find lessons, teacher materials and applicable research.
6. Students will know how to assess students’ progress not only to assign grades, but also to monitor and improve instruction.
7. Students will know and understand the rationale for new and expanded topics for middle and high school curricula.
8. Students will be able to teach students with various learning styles utilizing many tools such as cooperative learning, hands-on activities, writing for understanding and everyday assessment.

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 find out 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.

Class Topics

- **Math Teaching—The Big Picture**
  Professional Teaching Standards 1.6, 1.7, 1.8, 1.9, 1.10, 2.6, 2.7, 2.10, 5.2, 5.4, 7.3

- **Teaching Strategies and the Arizona and NCTM Standards**
  Professional Teaching Standards 1.1, 1.2, 1.3, 2.1, 2.3, 2.9, 3.3, 3.10, 6.2, 7.2, 8.13

- **What Makes a Good Lesson—Sample Lesson with Student Participation using Technology**
  Professional Teaching Standards 1.1 through 1.13, 2.4, 2.5, 2.6, 2.7, Standards 3.3 through 3.15, Standards 7.1 through 7.5

- **Research & Reality—What works in research and how do we adapt this to the classroom**
  Professional Teaching Standards 1.11, 1.12, 3.2, 3.3, 3.4, 3.7, 3.9, 3.10, 3.13, 1.14, 3.15, 1.8, 8.4, 8.5, 8.8

- **Methods, Motivation & Management**
  Professional Teaching Standards 2.1 through 2.10, 3.2, 3.3, 3.4, 3.8, 3.9, 3.10, 3.11, 3.12, 3.13, 3.15, 4.1, 4.2, 4.3, 4.4, 4.5

- **Student Presented Mini Lessons (Every student presents to the class)**
  Professional Teaching Standards 2.1 through 2.10, 3.1, 3.2, 3.6, 3.7, 3.8, 3.9, 3.10, 3.12, 4.1, 5.2, 6.1, 6.3, 7.1, 7.5, 8.2, 8.3

- **Learning Styles & Effective Lesson Plans**
  Professional Teaching Standards 1.1 through 1.13, 2.1, 2.2, 2.3, 2.4, 2.5, 2.7, 2.10, 3.2, 3.3, 3.7, 3.8, 3.12, 3.13, 3.14, 3.15, 3.1, 3.2, 3.3, 8.3, 8.4, 8.5, 8.6, 8.7

- **Questioning Techniques**
  Professional Teaching Standards 1.9, 1.11, 1.13, 2.1, 2.8, 2.10, 3.2, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 3.13, 3.14, 3.15, 4.1, 4.2, 6.1, 6.2, 6.3, 7.3, 7.4, 7.5, 8.1, 8.3, 8.5, 8.7

- **Cooperative Learning** *(This lesson is also closely tied to an observation.)*
  Professional Teaching Standards 2.1 through 2.10, 3.2, 3.4, 3.5, 3.6, 3.8, 3.9, 3.10, 3.11, 3.12, 3.13, 3.15, 4.1, 4.2, 4.3
• **Collegial Coaching—Students show their tapes and critique each other**
  Professional Teaching Standards 3.1 through 3.15, 4.1, 5.2, 5.3, 5.4, 5.5, 6.1, 6.2, 6.3

• **Motivation & Student Active Learning**
  Professional Teaching Standards 1.7 through 1.13, 2.1 through 2.10, 3.1 through 3.15

• **Assessment in the Mathematics Classroom**
  Professional Teaching Standards 1.1 through 1.13, 3.14, 3.15, 4.1 through 4.5 discussed, 5.5, 5.1, 5.2, 7.1 through 7.5

• **The Teaching Gap**
  Professional Teaching Standards: All levels of instruction are compared to the Japanese model that all students have read about in the book *The Teaching Gap*.

• **Procedure vs. Process**
  Professional Teaching Standards 1.8 through 1.13, 2.3 through 2.8, 3.8, 3.9, 3.10, 3.12, 3.13, 3.14, 3.15, 6.1

• **Questions & Solutions—A time to address any questions from the group through class discussion**
  Professional Teaching Standards—Many will be covered depending on questions asked.

• **Lesson Plan Sharing—each student presents their completed lesson with lesson plan to the class.**
  Professional Teaching Standards: This is the final product that should reflect what we have been working on all year. Standards include all of Standards 1, 2, 3, 4 and 7 and 8.1 to 8.8.

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**Course Assignments/Grading Scale**

You will be required to write and turn in an observation report for most of the classes you observe on Tuesday afternoons—eight write-ups, there will be more 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.

80 points total

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 October 24. In a later class you will show parts of the tape to the entire math methods class and we will all comment and discuss the lessons.

50 points for tape and reaction paper; 50 points for presentation—100 points

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 Arizona State Standards and uses the NCTM Process Standards. A lesson plan will be due earlier with a conference to follow. Each student will have a chance then to revise and enhance the lesson prior to the presentation. The Final lesson is due November 20 and the presentations themselves will be the day of finals, Dec. 11 (possibly Dec. 18) when you will present your lesson to the class. 50 points for original lesson plan; 50 points for final lesson plan; 50 points for presentation 150 points

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. 30 points
Throughout the semester you will be collecting articles, lessons, activities and resources from me, from the teacher you observe in the morning and from your afternoon observations. You will need to punch holes in all of these and organize them in a notebook to turn in at the end of the semester.  

40 points

Class participation and attendance, assigned readings with discussions/quizzes  100 points

**Total is 500 points**
90 to 100% = A, 80 to 89% = B, 70 to 79% = C

**Classroom Policies:** Please be on time. Please turn off cell phones and pagers prior to the start of class. Please review the university policies regarding plagiarism found in the Student Code of Academic Integrity [http://dos.web.arizona.edu/uapolicies/](http://dos.web.arizona.edu/uapolicies/) and the policies against threatening behavior by students [http://policy.web.arizona.edu/~policy/threaten.shtml](http://policy.web.arizona.edu/~policy/threaten.shtml)

**Attendance:** Every class is important and you are expected to be there every time we meet and/or have an observation. All absences will affect your grade in some way. (See the grading scale for class participation and attendance). If an absence is unavoidable (University out of town business, emergency at home, lock down at school, etc) it can be made up so you don’t miss points. If possible, as a matter of courtesy I would appreciate a telephone call or email notification in advance of any absence, or as soon as you know it is unavoidable. All holidays or special events observed by organized religions will be honored for those students who show affiliation with that religion. Absences pre-approved by the UA Dean of Students, or designee, will be honored as well.

**Accommodations:** Students registered with the Disability Resource Center must submit appropriate documentation to the instructor if requesting reasonable accommodations.

**Note:** Information contained in this syllabus with the exception of the attendance and grading policies may be subject to change with reasonable advanced notice, as deemed appropriate by the instructor.

**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).
- National Council of Teachers of Mathematics. (2002). *Lessons Learned from Research.* NCTM. *

*May be checked out from the instructor*