

**Problem Solving for High School Teachers, MA 310**  
**M-W-F 1-1:50 pm**  
**Whitehall Classroom Building CB 339**

**Instructor:** Dr. Katherine Paullin

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**Office Hours:** M-W-F 11am-12noon in POT 829

Thursday 2-3 pm in Mathskeller

or by appointment

**Textbooks:** *The Art and Craft of Problem Solving*, Second Edition, Paul Zeitz, Wiley, 2007.  
*What's Math Got To Do With It?*, Jo Boaler, Penguin Books, 2015.

**Other Required Materials:** A 3-ring binder to use as a portfolio, 3 tabbed dividers

**Course Goal:** This class will focus on the heuristics of problem solving. We will practice in solving problems from algebra, number theory, geometry, calculus, combinatorics and other areas. Primarily for middle and secondary school teachers, this course will also form connections with the Standards for Mathematical Content and the Standards for Mathematical Practice of the Common Core State Standards for Mathematics.

**Grading:**

**Exams:** Weekly short exams will be given in class. You will be allowed 20 minutes to finish. Exam problems will be similar in nature to problems we've been working in class that week. Exams will make up 40% of your final grade.

**Writing Assignments:** We will often be writing about the mathematics that we do in this course and the connections we see between the math we do and the math we will teach. Writing assignments may be graded for completion or based on content, depending on the goal of the assignment. Writing assignments will make up 20% of your final grade.

**Homework Problems:** Homework problems will be assigned often, and collected and graded as they are turned in. Homework problems returned with undesirable grades may be resubmitted for regrading within 1 week of the date returned. The homework problems will account for 30% of your final grade.

**Attendance, Participation, and Portfolio:** Attendance is expected. You will be allowed 3 unexcused absences, after which each unexcused absence will reduce your final grade by 2%. Your participation will be assessed through classroom discussions and the final portfolio. The final portfolio will be submitted for grading on Friday, April 29th, and will be returned on the final exam date. Your attendance, participation, and portfolio will account for 10% of your final grade.

The grading scale will be as follows:

90 + %	A
80 – 89%	B
70 – 79%	C
60 – 69%	D
0 – 59%	E

### **Final Portfolio and the Final Class Discussion:**

A final portfolio will be submitted for grading on the last day of class, Friday, April 29th. In a three ring binder, with 3 divider tabs labeled “Exams”, “Writing Assignments”, and “Homework Problems”, you will have the complete collection of all exams, writing assignments, and homework problems that have been graded and returned. The final portfolio will be used to assess your participation/portfolio grade for the class and will be handed back at the final exam time. Attendance at the final exam slot (May 3rd from 10:30-12:30) is mandatory. This time will be our final class discussion, and participation will be reflected in your participation grade.

### **Attendance and Make-Up Work:**

Attendance will be taken and is highly recommended. Because this is a discussion and group-work heavy course, missing class results in missing vital information. Please come to class, be on time, and be ready to learn. If you miss class, you are responsible for getting class notes from a classmate. Homework dates are strict, and I will not take late homework. If you are planning to miss class when homework is due, plan on submitting your homework early. Make up exams will be given only in cases of excused absences. This means the situation is verifiable, unpredictable, and out of your control. I expect to be notified as soon as possible, and we will then make arrangements for a make-up exam.

### **Academic Honesty:**

Students are expected to be honest in their academic work. Plagiarism, cheating, and dishonesty will be reported to the Ombud’s Office and may result in probation, expulsion, or worse. For the full policy, see [https://www.uky.edu/Ombud/ForStudents\\_AcademicIntegrity.php](https://www.uky.edu/Ombud/ForStudents_AcademicIntegrity.php)

It is your job as the student to not lead me to believe that you are academically dishonest! On homework problems and writing assignments, you may work with other students in the course to generate ideas and talk about the problems or prompts, but each student should write up the work themselves.

### **Disability Resource Center:**

People learn in a variety of ways. Resources to support student success are available on campus. Students who believe that, due to a disability, they could benefit from academic accommodations are encouraged to contact the Disability Resource Center at 859-257-2754 or visit <http://www.uky.edu/StudentAffairs/DisabilityResourceCenter/>

**Technology in the Classroom:**

Although cell phones and laptops are both highly useful parts of our society, neither should be disruptive in the classroom. Cell phones in the classroom should be silenced or at least set to vibrate. Although I do not suggest taking notes on your laptop computer, you may choose to attempt to do so. Please take care to not disrupt the learning environment of other students by browsing email, social networking sites, etc.

During an exam, cell phones will be turned off. The use of translators or other electronic devices, other than a calculator, is strictly prohibited on exams.

**UK Mathematics Department Professional Themes:**

This course will address the four themes of the conceptual framework for the UK professional education program: **research, reflection, learning, and leading**. Students will engage with fundamental ideas in mathematical *research, reflecting* on and analyzing core mathematical content that arises throughout mathematics at all levels. Students will develop as life-long mathematical *learners* who will be able to take active *leadership* roles in their future roles as professionals and citizens. The ultimate goal in addressing these four themes is to produce teacher leaders who work together to improve student learning among diverse populations and improve education in Kentucky and beyond.

**Unbridled Learning Initiatives and the Kentucky Core Academic Standards:**

This course will provide students an opportunity to advance their knowledge and mastery of the “tools” associated with Kentucky education reform, focusing on the content and practice standards outlined in the the Kentucky Core Academic Standards. As students carry out projects and complete assignments that involve mathematical content underlying instructional activities for P-12 students in Kentucky schools, they will address one or more components of the Unbridled Learning initiatives.

**Important Dates:**

January 13 First day of classes

January 18 Martin Luther King, Jr., Birthday Academic Holiday

January 20 Last day to add a class for the 2016 Spring Semester

February 3 Last day to drop a course without it appearing on the students transcript

March 7 Midpoint of the Semester

March 14-19 Spring Vacation Academic Holiday

April 1 Last day to withdraw from the University or reduce course load. Students can withdraw or reduce course load after this date only for urgent nonacademic reasons.

April 29 Last day of classes

May 3 Final exam, 10:30 am 12:30 pm, in our regular room

May 8 Commencement