

University of Wisconsin-Whitewater  
Curriculum Proposal Form #3  
**New Course**

**Effective Term:** 2147 (Fall 2014)

**Subject Area - Course Number:** **Math 422/622**  
(See Note #1 below)

**Cross-listing:**

**Course Title:** (Limited to 65 characters) Mathematics for High School Teachers II

**25-Character Abbreviation:** Math for H.S. Teachers II

**Sponsor(s):** Tamas Szabo

**Department(s):** Mathematical and Computer Sciences

**College(s):** Letters and Sciences

**Consultation took place:**  NA  Yes (list departments and attach consultation sheet)  
Departments: Curriculum and Instruction

**Programs Affected:** **Mathematics**

**Is paperwork complete for those programs?** (Use "Form 2" for Catalog & Academic Report updates)

NA  Yes  will be at future meeting

**Prerequisites:** Math 353 and Math 421

**Grade Basis:**  Conventional Letter  S/NC or Pass/Fail

**Course will be offered:**  Part of Load  Above Load  
 On Campus  Off Campus - Location

**College:** Letters and Sciences **Dept/Area(s):** Mathematical and Comp. Sci.

**Instructor:** Tamas Szabo

*Note: If the course is dual-listed, instructor must be a member of Grad Faculty.*

**Check if the Course is to Meet Any of the Following:**

Technological Literacy Requirement  Writing Requirement  
 Diversity  General Education Option: Select one:

Note: For the Gen Ed option, the proposal should address how this course relates to specific core courses, meets the goals of General Education in providing breadth, and incorporates scholarship in the appropriate field relating to women and gender.

**Credit/Contact Hours:** (per semester)

Total lab hours: 0 Total lecture hours: 48  
Number of credits: 3 Total contact hours: 48

**Can course be taken more than once for credit? (Repeatability)**

No  Yes If "Yes", answer the following questions:

No of times in major:

No of credits in major:

No of times in degree:

No of credits in degree:

Proposal Information: ([Procedures for form #3](#))

**Course justification:**

The proposed course is the second of a new two semester sequence that will fill a gap in the preparation of secondary mathematics teachers. It is intended to make the necessary connections and integrate knowledge learned in different courses in the university curriculum and high school curriculum. It will provide students with a deep, conceptual understanding of elementary mathematics from an advanced standpoint, crucial for becoming an effective teacher.

**Relationship to program assessment objectives:**

This course will directly help students in passing the Major Field Test which our department uses as an important assessment instrument of our majors. It also teaches skills secondary teachers of mathematics will need to learn to satisfy DPI requirements, and the teacher education program to earn accreditation.

**Budgetary impact:**

No additional faculty will be necessary to hire, since the redesigned program will have the same total number of courses taught.

**Course description:** (50 word limit)

The course continues the explorations of the high school curriculum from an advanced perspective that was started in Math 421. The focus is on deepening understanding of concepts, highlighting connections and solving challenging problems. The mathematical content includes congruence, distance, similarity, trigonometry, area, and volume. Connections to algebra are emphasized throughout the course.

**If dual listed, list graduate level requirements for the following:**

1. **Content** (e.g., What are additional presentation/project requirements?)

The assignments for graduate level would include more challenging problems with extra writing components. In addition, graduate students would receive one more individual research project than undergraduate students, each chapter of the proposed text has numerous projects listed. Presentations of those projects would be made to the whole class.

2. **Intensity** (e.g., How are the processes and standards of evaluation different for graduates and undergraduates? )

Graduate students would be evaluated based on assignments, exams and presentations of their individual research projects. The overall weight of the research projects should not be less than 25%. This course would also be ideal for inservice workshops for secondary mathematics teachers during Summer or throughout the year, who would earn graduate credit.

3. **Self-Directed** (e.g., How are research expectations differ for graduates and undergraduates?)

The extra work assigned for graduate credit could be done independently of the course and requires mostly individual work and consultations with the instructor.

**Course objectives and tentative course syllabus:**

**Course Objectives:**

Students will study the connections between different courses (e.g. calculus, abstract algebra, geometry, real analysis). The center of attention is on concepts in geometry and trigonometry that relate to high school mathematics. The course intends to extend and generalize familiar theorems, demonstrate alternate ways of approaching problems, and discuss historical contexts in which concepts arose and have changed over time.

**Evaluation:**

Homework Assignments (best 10 out of 12)	200 points
Research Project	200 points
Two midterm exams	200 points
Final Exam	200 points
Total	800 points

Homework will be collected and graded every week. No late homework will be accepted. One midterm grade may be replaced with the final exam score (scaled down to 100 points).

**Grading Scale:**

	87-89% B+	77-79% C+	67-69% D+	0-59% F
93-100% A	83-86% B	73-76% C	63-66% D	<i>All course grades will be</i>
90-92% A-	80-82% B-	70-72% C-	60-62% D-	<i>in the D2L gradebook.</i>

**Textbook:** *Mathematics for High School Teachers (An Advanced Perspective)* by Usiskin, Peressini, Marchisotto, and Stanley, Prentice Hall, 2003.

**Tentative course coverage:**

- Week 1: Euclid and congruence.
- Week 2: Congruence transformations.
- Week 3: Symmetry.
- Week 4: Congruence revisited.
- Week 5: Distance.
- Week 6: Similar figures.
- Week 7: Distances within figures.
- Week 8: Trigonometric ratios and angle measure.
- Week 9: Trigonometric functions.
- Week 10: Properties of trigonometric functions.
- Week 11: Area.
- Week 12: Volume.
- Week 13: Area representing probability.
- Week 14: Relationships among area, volume, and dimension.
- Week 15: Presentations of projects.

The University of Wisconsin-Whitewater is dedicated to a safe, supportive and non-discriminatory learning environment. It is the responsibility of all undergraduate and graduate students to familiarize themselves with University policies regarding [Special Accommodations](#), [Academic Misconduct](#), [Religious Beliefs Accommodation](#), [Discrimination](#) and [Absence for University Sponsored Events](#) (for details please refer to the Schedule of Classes; the ["Rights and Responsibilities"](#) section of the [Undergraduate Catalog](#); the [Academic Requirements](#) and Policies and the [Facilities and Services](#) sections of the [Graduate Catalog](#); and the ["Student Academic Disciplinary Procedures](#) (UWS Chapter 14); and the ["Student Nonacademic Disciplinary Procedures"](#) (UWS Chapter 17).

**Bibliography:** (Key or essential references only. Normally the bibliography should be no more than one or two pages in length.)

Berlinghoff, William and Fernando Gouvea, *Math through the ages: A Gentle History for Teachers and Others*, MAA, Washington, DC, 2003.

Bremigan, Bremigan, Lorch, *Mathematics for Secondary School Teachers*, MAA, Washington, DC, 2011.

Cuoco, *Mathematical Connections: A Companion for Teachers and Others*, MAA, Washington, DC, 2005.

Greenberg, *Euclidean and Non-Euclidean Geometries, Development and History*, Freeman, New York, NY, 2008.

Kinsey, Moore, Prassidis, *Geometry and Symmetry*, Wiley, Hoboken, NJ, 2011.

*The Mathematical Education of Teachers*, CBMS/AMS, Providence, RI, 2012.

*Principles and Standards for School Mathematics*, NCTM, Reston, VA, 2000.

Usiskin, Peressini, Marchisotto, and Stanley, *Mathematics for High School Teachers (An Advanced Perspective)*, Prentice Hall, 2003.

Zeitz, *The Art and Craft of Problem Solving*, Wiley, 2007.