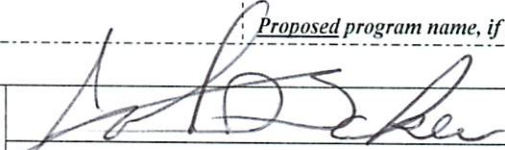
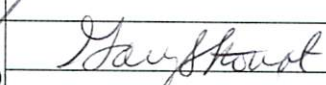


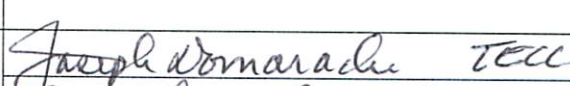
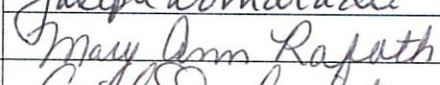
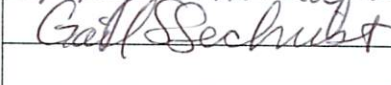


LSC Use Only No:	LSC Action-Date:	UWUCC USE Only No.	UWUCC Action-Date:	Senate Action Date:
		09-24d	AP-10/20/09	App-12/1/09

**Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee**

Contact Person <p align="center">John D. Baker</p>	Email Address <p align="center">jdbaker@iup.edu</p>
Proposing Department/Unit <p align="center">Mathematics</p>	Phone <p align="center">724-357-3795</p>

Check all appropriate lines and complete information as requested. Use a separate cover sheet for each course proposal and for each program proposal.

<b>1. Course Proposals (check all that apply)</b> <input type="checkbox"/> New Course <input type="checkbox"/> Course Prefix Change <input type="checkbox"/> Course Deletion <input checked="" type="checkbox"/> Course Revision <input checked="" type="checkbox"/> Course Number and/or Title Change <input checked="" type="checkbox"/> Catalog Description Change	
MATH 456 Geometry for Elementary and Middle School Teachers	MATH 456 Geometry for Elementary/Middle Level Teachers
<i>Current Course prefix, number and full title</i>	<i>Proposed course prefix, number and full title, if changing</i>
<b>2. Additional Course Designations: check if appropriate</b> <input type="checkbox"/> This course is also proposed as a Liberal Studies Course. <input type="checkbox"/> Other: (e.g., Women's Studies, Pan-African) <input type="checkbox"/> This course is also proposed as an Honors College Course.	
<b>3. Program Proposals</b> <input type="checkbox"/> New Degree Program <input type="checkbox"/> Program Title Change <input type="checkbox"/> Other <input type="checkbox"/> New Minor Program <input type="checkbox"/> New Track <input type="checkbox"/> Catalog Description Change <input type="checkbox"/> Program Revision	
<i>Current program name</i>	<i>Proposed program name, if changing</i>
<b>4. Approvals</b>	
Department Curriculum Committee Chair(s)	 Date: 3-7-09
Department Chair(s)	 Date: 3-9-09
College Curriculum Committee Chair	 Date: 3/16/09
College Dean	 Date: 3-16-09
Director of Liberal Studies *	
Director of Honors College *	
Provost *	
Additional signatures as appropriate: (include title)	 Date: 6-6-09
	 Date: 7-23-09
UWUCC Co-Chairs	 Date: 10-23-09

\* where applicable

Received

SEP 01 2009

OCT 23 2009

Liberal Studies

## **1. New Syllabus of Record, etc.**

### **I. Catalog Description**

**MATH 456 Geometry for Elementary/Middle Level Teachers**

**(3c-0l-3cr)**

**Prerequisite: MATH 152**

Students become acquainted with an informal, intuitive approach to geometry. Activities and materials for teaching geometrical concepts to children are an integral part of the course.

### **II. Course Outcomes**

Students will:

1. demonstrate conceptual understandings and procedural skills at the Elementary/Middle Level in geometry and measurement content areas. PDE Guideline: II.B.3.a, II.B.3.f
2. analyze relationships in basic concepts, shapes, and properties of two and three-dimensional shapes. PDE Guideline: II.B.3.b
3. analyze linear and spatial reasoning, geometric processes.  
PDE Guideline: II.B.3.c
4. recognize linear and spatial processes, techniques, and formulas. PDE Guideline: II.B.3.f, II.B.3.g
5. summarize knowledge of geometric representations through reasoning, problem solving, and communication.
6. use appropriate computer software for learning and applying geometric content. PDE Guideline: I.F.2
7. investigate the nature of geometry as taught at the Elementary/Middle Level.  
PDE Guideline: II.B.3.d, II.B.3.e
8. analyze developmental levels of geometric thought.

Course Outcome	College Conceptual Framework / Danielson	INTASC Standard/ Principle	NCATE / NCTM Middle Level Mathematics Standards	Course Assessment Measuring Outcome
#1	1a	1, 4	4, 5, 7, 11, 15	Projects, Quizzes, Midterm; Key Assessment: Final Exam
#2	1a	1, 4	4, 5, 7, 11	Projects, Quizzes, and Midterm & Final Exam
#3	1a	1, 4	4, 5, 7, 11, 15	Projects, Quizzes, and Midterm & Final Exam
#4	1a	1, 4	4, 5, 7, 11, 15	Projects, Quizzes, and Midterm & Final Exam
#5	1a	1, 4	1, 2, 3	Projects, Quizzes, and In-Class Activities Varies by Instructor
#6	1a	1, 4	6	Projects and Quizzes Varies by Instructor
#7	1a	1, 4	4, 5, 7	Projects and In-Class Activities Varies by Instructor
#8	1a	1, 4	7, 8	Projects Varies by Instructor

### III. Detailed Course Outline

- A. Basic Concepts / LOGO (Outcomes #1, #6) 4 academic hours
- B. Line & Angle Relationships (Outcomes #1, #2, #5, #7) 2 academic hours
- C. Circles / Introduction to Geometer's Sketchpad (Outcomes #1, #6) 2 academic hours
- D. Polygons / Constructions (Outcomes #1, #2, #5, #6, #7) 4 academic hours
  - 1. Definitions, Types, and Characteristics of Polygons
  - 2. Constructions with straightedge and compass
  - 3. Constructions with computer software
- E. Polygon & Quadrilateral Relationships (Outcomes #1, #2, #5, #7) 3 academic hours
- F. Symmetry / Quadrilateral Relationships (Outcomes #1, #2, #5, #7) 3 academic hours
- H. Tessellations with Polygons / Escher-Type Tessellations (Outcomes #3, #5, #7) 3 academic hours
- I. Transformational Geometry & Tessellations (Outcomes #3, #5, #7) 3 academic hours
- J. Measurement (Outcomes #1, #3, #5, #7) 3 academic hours
- K. Spatial Visualization (Outcomes #1, #3, #5, #7) 3 academic hours
- L. 3-Dimensional Geometry (Outcomes #2, #4, #5, #7) 3 academic hours
- M. 3-Dimensional Measurement (Outcomes #2, #4, #5, #7) 3 academic hours
- N. Topology / van Hiele Developmental Theory (Outcomes #1, #8) 3 academic hours

This syllabus covers 39 academic hours, leaving 3 academic hours for testing and/or review. The final is an additional 2 academic hours.

#### **IV. Evaluation Methods**

- 50% Midterm and Final. The final is the key assessments, comprising 25% of the course grade, and shall be required of all instructors of MATH 456. The midterm is 25% of the grade.
- 20% Projects.
- 30% Participation, Quizzes, and Short assignments.

#### **V. Grading Scale**

90 - 100	A
80 - 89	B
70 - 79	C
60 - 69	D
0 - 59	F

#### **VI. Undergraduate Course Attendance Policy**

The course attendance policy is consistent with the University policy.

#### **VII. Required Text**

Aichele, D., & Wolfe, J. (2008). *Geometric Structures: An Inquiry-Based Approach for Prospective Elementary and Middle School Teachers*. NJ: Pearson – Prentice Hall.

#### **VIII. Special Resource Requirements**

None.

#### **IX. Bibliography**

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- VanCleave, J (1994). *Geometry For Every Kid*. New York: John Wiley & Sons, Inc.

## 2. Summary of the Revision

We propose to change the name and prerequisite for the course, and establish a current syllabus of record. The last syllabus we have on file is from 1992.

**Current** – MATH 456 Geometry for Elementary and Middle School Teachers 3c-0l-3cr

Prerequisites: MATH 152, Elementary Education concentrate.

Students become acquainted with an informal, intuitive approach to geometry. Activities and materials for teaching geometrical concepts to children are an integral part of the course.

**Proposed** – MATH 456 Geometry for Elementary/Middle Level Teachers 3c-0l-3cr

Prerequisites: MATH 152

Students become acquainted with an informal, intuitive approach to geometry. Activities and materials for teaching geometrical concepts to children are an integral part of the course.

## 3. Rationale for the Revision

### Overview

The state of Pennsylvania has mandated changes to teacher training programs to support its new teacher licensing scheme. The current program for elementary grades K-6 is being replaced by new requirements for two training programs in: (1) Grades pre-K to 4 and (2) Grades 4-8.

These mandates from the state require revisions to existing courses and the addition of new courses. For Grades pre-K to 4, the new IUP teacher training program includes two courses in methods of teaching. The two new methods courses are revisions of existing methods courses for early childhood and elementary education.

For Grades 4 to 8, the new IUP teacher training program must provide coursework for prospective teachers to teach all subjects, but with a specialty in one subject area. The new program has four subject area tracks with mathematics being one track. The Mathematics Department, which supports the current K-6 program through a math concentrate for elementary education majors, will have a greater role in the math-track program.

The new math-track program will consist of nine mathematics content and one methods of teaching courses. The existing math concentrate courses (of which MATH 456 is one) need approval for revisions to fit the requirements of the new math-track program. Three new courses also need approval. The three other tracks will include three math content courses and one methods of teaching course drawn from the Mathematics Department's math-track courses.

### 1. Catalog Name Change

**Rationale:** This change makes the name of the course consistent with the course name designations in new state guidelines.

2. Prerequisite Change

***Rationale:*** The reference to a concentrate was eliminated. Under the new state mandates for teacher preparation programs, the concentrate for elementary education majors will no longer exist.

3. Course Revision - Syllabus of Record

***Rationale:*** The last syllabus in our files is from 1992 and this revision is consistent with the content prescribed in the new state guidelines.

4. Old Syllabus of Record

Next page

Mathematics Department  
 Indiana University of Pennsylvania  
 Indiana, PA 15705

**Course Number:** MA 456/EM 556  
**Course Title:** Principles of Geometry I  
**Credits:** 3 semester hours  
**Prerequisites:** MA 152, Elementary Education Concentration  
**Textbook:** Geometry: An Investigative Approach  
 By O'Daffer Phares  
 Addison Wesley  
**Revised:** 9/92

**Catalog Description:**

Students become acquainted with an informal, intuitive approach to geometry. Activities and materials for teaching geometrical concepts to children are an integral part of the course.

**Course Outline/Time Schedule:**

I. Course Emphasis

The emphasis of this course is on learning geometry in an investigative manner. Activities, group work, readings, discussion, short assignments, and projects are designed to facilitate the discovery of key geometric relationships. These include the basic concepts of geometry, polygon relationships, tessellations, three dimensional geometry, measurement, motion geometry, similarity, and topology.

II. Evaluation

The student's grade for this course will be based on their achievement in both examinations and projects.

III. Short Assignments

Throughout the semester you will be assigned individual and group activities, both in and out of class.

IV. Projects

The student will have two major projects for this course. Complete instructions will be given two weeks prior to the projects due dates.

V. Tentative Schedule			
A.	Introduction/Chapter 2: Basic Concepts		
B.	Chapter	3:	Polygon Relationships
C.	Chapter	4:	Tessellations
D.	Chapter	5:	3-Dimensional Geometry
E.	Chapter	6:	Measurement
F.	Chapter	7:	Motion Geometry
G.	Chapter	8:	Similarity
H.	Chapter	9:	Topology
I.	Chapter	10:	Patterns in Geometry