

**Course Title: Geometry of the Circle: *The Amazing Circle*,
Grades 5 and up
Instructor's Name: Jim Wilson, AIMS Education Foundation
Course Number: MAT 941
Number of Credit Units: 3 semester units**

Course Content/Description:

This course seeks to build a foundation for teaching and understanding Geometry Concepts. It is supported by classroom lessons written and compiled within the *AIMS* publication *The Amazing Circle* which forms the nucleus of the course. Alignment of State and National Standards to the Learning Goals is also an integral part of this course.

The book contains hands-on experiences designed to build the necessary foundation for developing meaning and understanding of the geometric properties and relationships of the circle including these basic ideas:

1. Point, line, line segment, radius, diameter, intersecting lines, parallel lines, perpendicular lines, arc, sector, congruence, angle, opposite angle, central angle, inscribed angle, diagonal, polygon, polygon classification, triangle classification, angle bisector, median, altitude, quadrilateral, trapezoid, rhombus, rectangle, and square
2. All of the above are discovered by the students as they fold, crease, unfold, observe, identify, compare, and draw conclusions regarding geometric concepts and relationships contained in a circular disk of paper
3. Students collect their work in a booklet
4. Continual practice and review is built-into the paper folding that starts each exploration

Additional extension lessons provide a level of application and problem solving.

Primary Learning Outcomes

Students will:

1. Participate in opportunities for implementation and sustained use of hands-on experiences in mathematics in a classroom setting
2. Engage in reflective practice through the use of instructional planning, focused questions, and reflective responses
3. Make connections for conceptual understanding by showing alignment of instructional experiences with national reform documents and state content standards for mathematics
4. Develop positive attitudes and confidence in teaching and learning
5. Expand their knowledge base of mathematics education
6. Will make connections to professional literature regarding content, theory and practice
7. Will identify State or National Standards that apply to the selected AIMS activities by aligning learning goals with State or National Content Standards

Course Materials

AIMS Book – *The Amazing Circle*

Manipulatives for one class to be used with lessons from text.

An Overview of AIMS (online- PDFs;

<http://www.aimsedu.org/downloads/pdf/download.php?file=sps.pdf>)

with required reading and application of ideas from the following articles:

A Model of Learning

The Skills for Thinking

(If internet is not available to download the pdfs, AIMS can mail copies of these pages. Please email spscourses@AIMSedu.org or call 1-888-733-2467 ext 120 to request copies.)

Focus questions and guidelines for responses based on understanding and application of materials and ideas.

Overall plan for Implementation

Summary of Alignment with State Content Standards

Application of the Model of Mathematics

Application of Thinking Skills and Alignment with Standards and Learning Goals

Reflective Response and Focus Questions

Integrated Curriculum Form

Professional Growth and Reflection: A Response to Articles and Experience

Course Requirements/Schedule of Topics and Assignments

Option A with a Classroom of Students

1. Read completely the related AIMS publication, *The Amazing Circle*.
2. Read the selected articles in **An Overview of AIMS** (online- PDFs; <http://www.aimsedu.org/downloads/pdf/download.php?file=sps.pdf>) with required reading and application of ideas from the following:
A Model of Learning
The Skills for Thinking
(If Internet is not available to download the pdfs, AIMS can mail copies of these pages. Please email spscourses@AIMSedu.org or call 1-888-733-2467 ext 120 to request copies.)
3. Design a plan for the implementation of the first 18 *Exploring the Amazing Circle* experiences from *The Amazing Circle* including a summary of and rationale for the selection of AIMS lessons.
4. Choose one lesson from *The Amazing Circle* and describe how it addresses the four learning environments of the **Model of Mathematics/Learning**.
5. Implement the first 18 lessons in the classroom with students over an eight-week period.

6. Prior to teaching each lesson, apply the *Skills for Thinking* to the design of tasks and discussion questions reflecting important concepts, skills and processes integral to each lesson. Record these on pages labeled **Applying Thinking Skills**. Also record the Learning Goals and appropriate State Standards on pages labeled Applying Thinking Skills.
7. After each lesson, reflect upon your teaching by responding to the Reflective Response focus questions.
8. Show summary of alignment of learning goals with **State Content Standards**.
Content Standards for each state may be found at this Web-site address:
US Department of Education has links to the state department of education for each state.
http://wdcrobcolp01.ed.gov/Programs/EROD/org_list.cfm?category_ID=SEA
9. Complete a **Professional Growth and Reflection** form describing how the selected articles (see number 2 above) and the teaching experience impacted you and your teaching.

Method of Assessment

Provide evidence of the design, implementation, evaluation and reflection of the collective experiences by returning the completed assignments.

Unless otherwise indicated, students successfully completing this course will earn a Credit/No credit grade or where a letter grade is requested by checking the appropriate box on the Fresno Pacific University grade form, a letter grade of B will be issued. In order to earn a letter grade of A, additional work beyond what is described will be required.

Additional requirement for an earned letter grade of A

Complete *The Amazing Circle* Explorations 19 – 21. Make the 5 Platonic Solids and complete the faces-vertices-edges chart on page 55 of *The Amazing Circle*.

The discernment between an A or a B is at the discretion of the instructor of record based on the quality of the evidence submitted.

Option B - Without a Classroom of Students

1. Read completely the related AIMS publication, *The Amazing Circle*.
2. Read the selected articles in **An Overview of AIMS** (online- PDFs; <http://www.aimsedu.org/downloads/pdf/download.php?file=sps.pdf>) with required reading and application of ideas from the following:
A Model of Learning
The Skills for Thinking
(If Internet is not available to download the pdfs, AIMS can mail copies of these pages. Please email spscourses@AIMSedu.org or call 1-888-733-2467 ext 120 to request copies.)
3. Design a plan for the implementation of the all the *Exploring the Amazing Circle* experiences from *The Amazing Circle* including a summary of and rationale for the use of the AIMS lessons.
4. Choose one lesson from *The Amazing Circle* and describe how it addresses the four learning environments of the **Model of Mathematics/Learning**.

5. Apply the *Skills for Thinking* to the design of tasks and discussion questions reflecting important concepts, skills and processes integral to each lesson. Record these on pages labeled **Applying Thinking Skills**. Also record the Learning Goals and appropriate State Standards on pages labeled Applying Thinking Skills.
6. Show summary of alignment of learning goals with **State Content Standards**. Content Standards for each state may be found at this Web-site address:
US Department of Education has links to the state department of education for each state.
http://wdcrobcolp01.ed.gov/Programs/EROD/org_list.cfm?category_ID=SEA
7. Select 8 - 10 AIMS activities to integrate into the Language Arts/Reading, Science, Social Studies, or other topics in the mathematics curriculum. Design a plan including your rationale for your selection of activities and how you are going to connect these activities with other subject areas.
8. Complete a **Professional Growth and Reflection** form describing how the selected articles (see number 2 above) and the teaching experience will impact you and your teaching.

Method of Assessment

Provide evidence of the design, implementation, evaluation and reflection of the collective experiences by returning the completed assignments.

Unless otherwise indicated, students successfully completing this course will earn a Credit/No credit grade or where a letter grade is requested by checking the appropriate box on the Fresno Pacific University grade form, a letter grade of B will be issued. In order to earn a letter grade of A, additional work beyond what is described will be required.

Additional requirement for an earned letter grade of A.

Make the 5 Platonic Solids (see *The Amazing Circle* Explorations 19-21) and complete the faces-vertices-edges chart on page 55 of *The Amazing Circle*.

The discernment between an A or a B is at the discretion of the instructor of record based on the quality of the evidence submitted.

University Policy on Plagiarism

All people participating in the educational process at Fresno Pacific University are expected to pursue honesty and integrity in all aspects of their academic work. Academic dishonesty, including plagiarism, will be handled according to the procedures set forth on page 8 of the Fresno Pacific University Catalogue.