

Fresno Pacific University
Center for Professional Development

Course Syllabus

MAT 950 Understanding Geometric Concepts (6-9)

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Course Content/Description

This course seeks to build a foundation for teaching and understanding geometry from a new perspective. It is supported by classroom lessons/activities written and compiled within the **AIMS** publication **Looking at Geometry** which forms the nucleus of the course.

From hands-on experiences, students construct an understanding of geometric formulas that allows them to work backwards and forwards to solve problems of measurement. These hands-on experiences also provide a rich understanding of dimensions and their relationships to each other.

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 journal entries;
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; and
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 – *Looking at Geometry*

Thinking Skills Chart

An Overview of AIMS with required reading and application of ideas from the following selected articles:

A Model of Mathematics

AIMS as a Way of Thinking, Parts 1 and 2

A Model of Learning and Five Star Lessons

The Skills for Thinking

Assessment Connected to Teaching and Learning

Facilitating AIMS in the Classroom

AIMS Activity Format

Journal with 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
Journal 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

Text: *Looking at Geometry* (AIMS Education Foundation, 2003).
Familiarize yourself with the entire book.

1. Students will read completely the related **AIMS** publication, ***Looking at Geometry***. (AIMS Education Foundation, 2003)
2. Students will read the selected articles in **An Overview of AIMS** that substantiate the underlying learning theory and foundation for teaching.
 - A Model of Mathematics*
 - AIMS as a Way of Thinking, Parts 1 and 2*
 - A Model of Learning and Five Star Lessons*
 - The Skills for Thinking*
 - Assessment Connected to Teaching and Learning*
 - Facilitating AIMS in the Classroom*
 - AIMS Activity Format*

In your **Teaching Journal**:

3. Students will design a plan for implementation of 10 - 12 experiences from ***Looking at Geometry*** including a summary of and rationale for the selection of **AIMS** lessons.
4. Students will choose one lesson from ***Looking at Geometry*** and describe how it addresses the four learning environments of the **Model of Mathematics/Learning**.
5. Students will implement 10 – 12 lessons in the classroom with students over a three to four week period.
6. Prior to teaching each lesson, students will apply the ***Skills for Thinking*** to the design of tasks and discussion questions reflecting important concepts, skills and processes integral to each lesson. Students will record these in a **Journal** on pages labeled **Applying the Thinking Skills**. Students will also record the Learning Goal and appropriate State Standards on the pages labeled Applying the Thinking Skills.
7. After each lesson, students will reflect upon their teaching by responding to the focus questions on the **Journal Response** forms provided.
8. Students will show summary of alignment of learning goals with State **Content Standards**.
State Content Standards may be found at this Web-site address:
www.teacheruniverse.com/home.html
Go to Standards Locator. Click on any state or territory on the map pictured. Then click on mathematics under the "Students" heading.
9. Students will complete a **Professional Growth and Reflection** form describing how the selected articles (see number 2 above) and the teaching experience impacted them and their teaching.

Method of Assessment

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

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.

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.

Additional requirement for an earned letter grade of A.

1. Adapt, modify, or use one of the investigations in the book as a final performance assessment of understanding of Looking at Geometry.
2. Submit a summary of how the activity was used and/or modified explaining the rationale for using the activity in this way.
3. Include at least four examples of student work on the final performance assessment, which demonstrate the variety of student successes.

Option B - Without a Classroom of Students

Text: Looking at Geometry (AIMS Education Foundation, 2003).

Familiarize yourself with the entire book.

1. Students will read completely the related **AIMS** publication, **Looking at Geometry**. (AIMS Education Foundation, 2003)
2. Students will read the selected articles in **An Overview of AIMS** that substantiate the underlying learning theory and foundation for teaching.
 - A Model of Mathematics*
 - AIMS as a Way of Thinking, Parts 1 and 2*
 - A Model of Learning and Five Star Lessons*
 - The Skills for Thinking*
 - Assessment Connected to Teaching and Learning*
 - Facilitating AIMS in the Classroom*
 - AIMS Activity Format*

In your **Teaching Journal**:

3. Students will design a plan for implementation of all 20 experiences from **Looking at Geometry** including a summary of and rationale for the selection of **AIMS** lessons.
4. Students will choose one lesson from **Looking at Geometry** and describe how it addresses the four learning environments of the **Model of Mathematics/Learning**.
5. Prior to teaching each lesson, students will apply the **Skills for Thinking** to the design of tasks and discussion questions reflecting important concepts, skills and processes integral to each lesson. Students will record these in a **Journal** on pages labeled **Applying the Thinking Skills**. Students will also record the Learning Goal and appropriate State Standards on the pages labeled Applying the Thinking Skills.
6. Students will show summary of alignment of learning goals with State **Content Standards**. State Content Standards may be found at this Web-site address:
www.teacheruniverse.com/home.html
Go to Standards Locator. Click on any state or territory on the map pictured. Then click on mathematics under the "Students" heading.
7. Students will complete a **Professional Growth and Reflection** form describing how the selected articles (see number 2 above) and the teaching experience impacted them and their teaching.

Method of Assessment

Provide evidence of the design, implementation, evaluation and reflection of the collective experiences

by returning the completed **Teaching Journal**.

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.

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.

Additional requirement for an earned letter grade of A.

1. Develop a plan to adapt, modify, or use one of the investigations in the book as a final performance assessment of understanding of Looking at Geometry.
2. Submit a summary of how the activity would be used and/or modified explaining the rationale for using the activity in this way.

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.