

SYLLABUS

Fresno Pacific University School of Professional Studies

Investigations with Integers



Instructor: Sheldon J. Erickson

Course Title: Investigations with Integers

Course Number: MAT 951

Number of Credit Units: 3 semester units

Teachers taking this course must have access to a classroom of students with which they can implement the selected experiences.

Course Content/Description:

This course provides instruction, understanding, and application of signed numbers. This course seeks to build a foundation for best practices in using hands-on experiences. It also serves to enable them to reflect upon their teaching practice. This results in better classroom applications and increased benefits for students.

The activities include both those for conceptual development and practice, and those that broaden understanding through application. The activities are designed to develop an understanding of integers using different models.

- Learn to add, subtract, multiply, and divide integers
- Understand “why” answers are positive or negative
- Directional models, value models and playful practice

Learning Goals

1. To provide guided opportunities for implementation and sustained use of hands-on experiences in mathematics in a classroom setting
2. To provide opportunity for reflective practice through the use of instructional planning, focused questions, and reflective responses
3. To increase the opportunity for conceptual understanding by showing alignment of instructional experiences with state content standards for mathematics
4. To foster positive attitudes and confidence in teaching and learning
5. To expand knowledge base of mathematics education

Policy on Plagiarism

All people participation in the education process at Fresno Pacific University are expected to pursue honest and integrity in all aspects of their academic work. Academic dishonesty, including plagiarism, will be handled according to the procedures set forth in the Fresno Pacific University Catalogue.

Essential Course Components

1. Students will completely familiarize themselves with the activities in the AIMS publication *Positive vs Negative: Investigations with Integers*.
2. Students will 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. Students will design a plan for implementation of twelve (12) experiences from the AIMS publication *Positive vs Negative: Investigations with Integers* including a summary of and rationale for the selection of *AIMS* lessons.
4. Students will choose one lesson from the AIMS publication *Positive vs Negative: Investigations with Integers* and describe how it addresses the four learning environments of the **Model of Mathematics/Learning**.
5. Students will implement twelve (12) lessons in the classroom with students over the duration of the course.
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 on pages labeled **Applying Thinking Skills**. Students will also record the Learning Goal **and** appropriate State Standards on pages labeled Applying Thinking Skills.
7. 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

8. After each lesson, students will reflect upon their teaching by responding to the Reflective Response focus questions.
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.

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 Directional Model or Value Model.
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.
4. Include a scoring rubric and written analysis of what you learned about student understanding from looking at the included examples of students' work. Reflect on how what you learned from the assessment might change your instruction in the future.