

Instructional Methods/Strategies II

MSED 400 (3 credit hours)

IIT's Mathematics and Science Education Program

The overall conceptual framework for our program borrows heavily from Shulman's (1986) *Knowledge Growth in Teaching* with the ultimate focus on *the Teacher as Transformer of Subject Matter*. The program focuses on the development, revision, and elaboration of six primary domains of knowledge that both theory and research have indicated are essential for effective instruction. It is this combination of domains of knowledge that distinguishes the expert teacher from others possessing one or more of the following domains of knowledge.

- 1. Subject matter knowledge:** Knowledge of foundational ideas and conceptual schemes, data and procedures within a specific subject matter area.
- 2. Pedagogical knowledge:** Knowledge of generic principles and strategies of classroom instruction (e.g., instructional models and integration of technology) and management.
- 3. Knowledge of schools:** Knowledge of educational contexts, i.e., the place of the classroom in the school, school in the community and other social contexts.
- 4. Knowledge of learners:** Knowledge of all aspects of intellectual, social and emotional development of all students regardless of cultural, social, ethnic background.
- 5. Curricular knowledge:** Knowledge of development and implementation of programs and materials.
- 6. Pedagogical Content knowledge:** The way of representing and formulating subject matter knowledge that makes it comprehensible to others (i.e., knowledge of how to transform and represent subject matter so that it is comprehensible to students or others).

Course Description

Follow-up course to Instructional Methods/Strategies I with a strong focus in various advanced instructional models such as inductive, deductive, synectics, inquiry role development, technology integration, and cooperative learning. How to effectively teach ALL students and assess student learning in these contexts is also addressed. Students will have several opportunities to practice instructional models in peer teaching lessons.

Course Goals

Textbooks and Materials

All:

- (a) American Association for the Advancement of Science. (1993). *Benchmarks for science literacy*. New York: Oxford University Press. Website: <http://www.project2061.org/publications/bsl/online/bolintro.htm>
- (b) Stefanich, G. (2007). *Inclusive science strategies*. National Science Foundation: USA.
- (c) International Technology Education Association (2000). *Standards for technological literacy*. Reston, VA: Author. Website: <http://www.iteaconnect.org/TAA/PDFs/xstnd.pdf>

Math:

- (a) Posamentier, A.S., Smith, B.S., & Stepelman, J. (2006). *Teaching secondary mathematics: Techniques and enrichment units* (7th ed.). Upper Saddle River, NJ: Pearson Education, Inc.

(b) National Council of Teachers of Mathematics. (2001). *Principles and standards for school mathematics*. Reston, VA: Author. Website: <http://standards.nctm.org/document/index.htm>

Science:

(a) Chiappetta, E.L., Koballa, T.R. (2006). *Science instruction in the middle and secondary schools*. (6th ed.). New Jersey: Merrill Prentice Hall.

(b) National Research Council. (1996) *National science education standards*. Washington, D.C.: Author. Website: <http://www.nap.edu/readingroom/books/nse>

(c) Various handouts will be distributed throughout the course

i. Editorial (1999). Mathematical MIAs. *School Science and Mathematics*, 99 (2).

Topical Sequence

- Inductive teaching Model
- Deductive teaching Model
- Inquiry Role Development
- Diversity and Equity: Teaching All students
- Questioning
- Field Trips
- Group Learning
- Assessment and Evaluation
- Unit and Course Planning
- Peer Teaching
- Technology Integration
- Professional Development

Evaluation:

Grades will be based upon total points received from:

Lesson Plans (sequence of 3)

Peer teaching lessons and plans (3)

Resource Cards (20)

There will be no curve. Students will strive for pre-determined levels of mastery rather than compete against each other. The levels of mastery are as follows:

90 – 100% = A

80 – 89% = B

70 – 79% = C

60 – 69% = D

0 – 59% = F

Accommodations:

Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources and make an appointment to speak with me as soon as possible. My office hours are. . .

The Center for Disability Resources is located in the Life Sciences Building, room 218, 312-567-5744 or disabilities@iit.edu.

Resource Idea/Card Section Definitions and Inclusions

1. Title and Source/citation
2. **Idea:** An overview or brief description of the idea and its purpose
For example: Have students count stripes on sunflower seeds to illustrate a normal distribution.
3. **Connection to Standards:** Specify the National Standards or Benchmark that your Idea will help students achieve.
4. **Use:** Describe when and how the idea will actually be implemented within a lesson
For example: Please see sample resource idea/card
5. **Materials:** Specify the materials (class set or per student) that are needed for the idea
6. **Modifications:** Identify alternative uses of the idea or alternative materials if recommended materials are unavailable, and include modifications to address the diverse needs of the learners.

Resource Idea/Card Critique Sheet

Name _____

Grade _____

Overall Assessment:

1. I have used the following symbols at the top of each idea/card to indicate deficient items:

- 0 - Idea
 - \$ - Connection to Standards
 - √ - Use
 - * - Modifications
 - # - Materials
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2. Variety of Ideas (e.g., demonstrations, labs, pictures, bulletin board items, etc.)

3. Attention to inquiry/problem solving and the nature of science/mathematics.

4. General Comments: