

Miami Dade College - School of Education

EDG 2372 - Introduction to Teaching Mathematics and Science for Paraprofessionals

Course Description

3 credits

This course provides an introduction to theoretical and practical frameworks for enabling the learning of mathematics and understanding the scientific process using approaches to accommodate diverse student population. The course also presents best practices (methods and strategies) specific to Florida's Sunshine State Standards, subject matter competencies, and pedagogy pertinent to the discipline. A minimum of 10 hours of structured field experience is required. Pre/Co-requisite for this course: BSC1005 and MAC 1105.

Course Competencies

Competency 1: The student will demonstrate knowledge of current reform movements in mathematics education and science education by:

- a. identifying factors leading to systemic change of delivery of mathematics and science education.
- b. identifying strategies to use in inquiry based mathematics and science classrooms.

Competency 2: The student will demonstrate an understanding of current research related to the teaching and learning of elementary school mathematics and science by:

- a. examining professional journals and identifying organizations that disseminate information about current trends in mathematics and science.
- b. examining web-based research tools.

Competency 3: The student will analyze the constructivist learning method and other learning philosophies in regard to mathematics education and science education by:

- a. identifying individual learning styles through completion of a survey.
- b. describing the components of the constructivist philosophy for teaching mathematics and science.
- c. discussing Piaget's Theory of Cognitive Development and stages of development.
- d. discussing Howard Gardner's theory of Multiple Intelligences.
- e. discussing the characteristics of Bruner's Discovery Learning Model.

Competency 4: The student will demonstrate an understanding of the applications of math and science by:

- a. applying mathematical and geometrical properties to solve real-world problems.
- b. identifying a variety of jobs for which a background in math or science is useful.
- c. describing careers in the fields of math and science.

Competency 5: The student will demonstrate the ability to assist all learners including ESOL, ESE, and multicultural diverse populations in achieving high standards in mathematics education and science education by:

- a. identifying equity, ethical, and legal issues concerning a variety of populations.
- b. summarizing important aspects of the complex reality in cultural heritage, lifestyles, and value systems among the children, youth, and families they serve.
- c. identifying famous individuals in the field of science from diverse backgrounds.

Competency 6: The student will demonstrate knowledge of state and national mathematics standards and principles by:

- a. examining and explaining the differences and similarities between the state and national mathematics standards and principals.
- b. applying the components of an instructional objective.

Competency 7: The student will demonstrate an understanding of the use of formal and informal tools to measure student knowledge by:

- a. examining the elements of the Florida Comprehensive Assessment Test (FCAT) for Mathematics, SAT 9- NRT for Mathematics, Florida Comprehensive Assessment Test (FCAT) for Science, checklists, journals, rubrics, portfolios, etc.
- b. describing FCAT Math Item Specifications, content limits, and annually assessed benchmarks.
- c. describing FCAT Science Item Specifications, content limits, and annually assessed benchmarks.
- d. developing an informal performance based observation checklist to utilize with a small group of learners.

Competency 8: The student will demonstrate the ability to access and apply the use of technology to enhance mathematics and science instruction by:

- a. identifying appropriate technology for assisting in the learning of a mathematical concept.
- b. identifying appropriate assistive technology for teaching a scientific concept.
- c. evaluating and reflecting on the pedagogical soundness of a mathematics lesson available through the Internet.
- d. evaluating and reflecting on the pedagogical soundness of a science lesson available through the Internet.

Competency 9: The student will demonstrate knowledge of use of appropriate manipulatives to develop a mathematical concept and a scientific concept by:

- a. developing an activity utilizing a manipulative to assist in the learning of a mathematical concept.
- b. developing an activity utilizing resource materials to teach a scientific concept.
- c. adapting or modifying an activity for learners lacking pre-skills in mathematics and/or science necessary to learn the new skill.

Competency 10: The student will demonstrate ability to instruct individuals or a small group of children by:

- a. defining a scientific concept following the constructive model.
- b. developing an activity to assist in the learning of a mathematical concept following the constructive model.
- c. developing and conducting meaningful mathematics and science hands-on activities.
- d. conducting a learning activity with a small group of children.

Competency 11: The student will demonstrate the ability to create an integrated mathematics and science hands-on activity by:

- a. developing an integrated mathematics and science hands-on math activity.
- b. presenting the integrated activity to classmates.