Science Education (MA) Program Details

Purpose

Our purpose is to prepare students to successfully interact within the society they will enter upon termination of their formal schooling. This purpose is served by offering the human physical resources required to support the opportunity to acquire deep understandings about important facts and issues. Higher order thinking skills are provided in an environment that promotes cooperation and tolerance. Students are prepared to enter the work force with adequate communication skills. Minimal training for the work force will be required.

Goals and Objectives

The Science Education Master's Degree program is designed to provide a middle and senior high school science teachers with additional training in at least two science disciplines, as well s, in the methodologies and techniques appropriate to the teaching experience. The goals of this program are:

1. To provide an exemplary program for the education of science teachers.
2. To provide a contemporary methodological foundation in science education.
3. To provide an opportunity for science teachers to broaden their understanding of concepts and issues related to their major discipline.
4. To provide an interdisciplinary perspective of the relationship between science, technology, and society.
5. To provide an opportunity to participate in the rigors of research and to appreciate its implications in classroom situations.

Requirements

This program requires the successful completion (3.0 grade point average) of thirty-six semester hours of graduate level courses including 15 hours of Science Education core courses, 15 hours of Science Electives and six hours of Science Education electives.

Capstone Options

Students may choose one of the following options for completing the Capstone Requirement.

1. **Research Thesis:** Students selecting the thesis option must satisfactorily conduct an empirical research study and successfully defend the thesis before a faculty committee.
2. **Scholarly research and multimedia presentation:** This option requires students to write a scholarly research paper and present the contents of the paper in a multi-media presentation to a faculty committee.

Required Courses [1]

Course Descriptions:

PSED-626. SCIENCE, TECHNOLGY, AND SOCIETY.
This course is designed to investigate the linkages that exist among science, technology, and society. An interdisciplinary approach will be assumed to convey the interrelationships that exist among science, technology and the humanities, with a focus on various historic, current and ongoing ethical issues in science an social policy. 3 credits.

PSED-627. RESEARCH EXPERIENCE IN SCIENCE.
This course will provide a field experience for science teachers that are designed to present science as dynamic problem-solving endeavors. Students will work towards the resolution of a problem with a practicing scientist in his or her discipline. 3 credits.

PSED-628. ANALYSIS OF RESEARCH ON TEACHING SCIENCE.
This course provides the student with the means by which they may systematically evaluate current classroom teaching practices, and analyze the dynamics of student-teacher interactions. Methods of educational research in naturalistic settings will be examined. This course will consist of classroom instruction, field work in various school settings, and laboratory work, on the SPSS-X computer system at the college. 3 credits.

PSED-629. CONTEMPORARY METHODS OF SCIENCE TEACHING.
A survey of methodologies will be presented that research has indicated are most effective for teaching science. Methods will be presented from a constructed perspective. Contemporary curriculum and assessment philosophies and materials will also be discussed. 3 credits.

PSED-630. INTERDISCIPLINARY SCIENCE.
This is an interdisciplinary approach to the study of scientific principles. Common concepts and themes such as atomic theory, systems and energy will be studied in a context that relates the concept to multiple scientific disciplines. 3 credits.

PSED-615. EDUCATIONAL MEASUREMENT AND STATISTICS.
The nature of measurement and types of scales, unites, scores, norms, sampling, item analysis, batteries and profiles will be explored. Principles of reliability and validity and the use of test scores in decision making as well as descriptive and inferential statistics and the design of educational research are course topics. 3 credits.

Course Descriptions/Electives

PSED-625. MATHEMATICS FOR SCIENCE TEACHERS.
This is a predominantly methods-based course in which various means of presenting mathematical concepts are developed/devised/researched. Application of math principles to science topics will be stressed. The concepts to be dealt with will include, but not be limited to: factor-label (unit-analysis), metrics, proportionalities, triangulation, graphing, data analysis, etc. The integration of NCTM standards with science instruction will be addressed. 3 credits.

PSED-631. SELECTED TOPICS IN SCIENCE EDUCATION.
This course is designed to allow flexibility in the selection of specific educational topics to meet students' needs and interests, as well as professor expertise. Topics will be posted prior to the first class meetings. 1 credit.

PSED-632. SELECTED TOPICS IN SCIENCE EDUCATION.
As per above. 2 credits.

PSED-633. SELECTED TOPICS IN SCIENCE EDUCATION.
As per above. 3 credits.

PSED-634. COMPUTERS AND OTHER TECHNOLOGIES IN SCIENCE TEACHING.
This course is an introduction to the use of the computer and other technologies in interactive modes in the science classroom and laboratory. Emphasis will be placed upon the construction of inexpensive equipment and review of currently available software to accompany the equipment. 3 credits.

PSED-636. THE SCIENCE OLYMPIAD AND OTHER COMPETITIONS.
The course is designed to give science teachers background information needed to prepare an Olympiad team for competition within the individual classroom, school, state or nation. It consists of an overview of the activities, with emphasis upon specific curricular topics that will help the teacher better prepare their team. 3 credits.

EDUC-614. HUMAN GROWTH AND DEVELOPMENT.
This course focuses upon the educational implications of human development throughout the life span. Students will survey

research giving special attention to application to teaching and development of school programs. 3 credits.

EDUC-611. THEORIES AND PRACTICES IN EXCEPTIONALITIES.
This course is designed to identify exceptional learner and provide an understanding of their educational need. Specific teaching techniques will be explored as well as principles and practices of program development. 3 credits.

EDUC-699. THESIS OPTION. 6 credits.

Links
[1] http://www.desu.edu/sites/default/files/u50/Science%20Ed%20Req%20Courses.pdf