SYLLABUS

ST633  Capstone:  Curriculum, Instruction, and Assessment in Science Education

Catalog Description: This course will address the issue of designing, implementing, and assessing a science curriculum, weaving the skills obtained in the other science courses within the program. Only students in the On-Line Masters Program in Teaching and Learning in Elementary Education may enroll in this course. Prerequisites:  ST630, ST631, ST632.  (3)

Course Description:  This course will focus on the elements of planning, implementing and assessing science instruction based on the National Science Education Standards and Missouri Science Frameworks. Students will become familiar with the national as well as the state standards of science education. Students will design curriculum, and implement and assess the instruction based on these standards. Students will learn and use various authentic/alternative assessment procedures to measure the student learning outcomes to promote the inquiry-oriented science learning process.

Rationale: The success of a reform-based science education program is directly linked to the skills required to design, implement, and assess an inquiry-based school science curriculum. Simply memorizing these skill elements in an isolated manner does not ensure success. It calls for weaving together these skills and applying them in the classroom context.

Credit Hours:  3

Prerequisites:  ST630, ST631, and ST632.

Conceptual Framework:

Course Objectives:
The student will:
A. become familiar with the guidelines and standards from the National Science Education Standards, Benchmarks for Science Literacy, AAAS Atlas, Missouri’s “Show-Me Standards” and the Missouri Science Frameworks for Curriculum Development in Science for K-7th grade.
B. become familiar with the NSES focused on assessment in science education.
C. gain knowledge of designing standards-based science curriculum and inquiry-based science pedagogy.
D. be able to construct inquiry focused units and lesson plans and implement them in the classroom.
E. explore assessment strategies and develop and use authentic assessment tasks/instrument and scoring guide.
F. apply science process skills in conducting scientific investigations to answer authentic science questions and present the findings.
G. portray students’ science learning achievement and habits of mind.
H. compare and contrast the explicit curriculum, the teacher planed curriculum, the delivered curriculum and the learned curriculum through reflections.

Course Content:  This course was developed in an outcomes-based format and was designed to conform to the 45 contact hour expectation common for three credit hour courses. The specific
course content, outlined in the course objectives, will be delineated by the instructional design team and the instructor of record.

1) National Science Education Standards
2) Missouri Science State Frameworks
3) Designing, implementing, and reflecting upon curriculum
4) Various constructivist teaching approaches such as the inquiry model
5) Development of various formal and informal assessment tools
6) Development of scoring guides
7) An action research project

**Methods of Instruction:** E-mail, chat, search, document sharing, journals, webliographies, threaded discussions, online assessments, narrated presentations, interactive assignments and activities, action research project.

**Portfolio Requirement:** A portfolio module will be developed to give evidence of competencies addressed in this class. Possible suggestions for the portfolio module for this course are:
1) Pre-assessment of attitude toward science (10% of grade)
2) Designing unit and lesson plans and appropriate assessment methods, constructing scoring guides, implementation of inquiry-based techniques, learning cycle, problems-based learning, cooperative learning, performance-based assessment (40% of grade)
3) Through planning and activities based on MO Frameworks, identification of process skills and variables in each occasion (20% of grade)
4) Research project write-up (20% of grade)
5) Post-assessment of attitude toward science (10% of grade)

**Research Component:** The students will research instructional strategies that best meet the identified needs.

**Grading Policy:** Specifics to be determined by the instructional design team and the instructor of record
- Online course review 25%
- Research review of online learning 10%
- Threaded discussion participation 15%
- Design and initial development of portfolio 50%

**Course Schedule:** To be determined by the instructional design team and the instructor of record

**Textbooks (Title, Author, ISBN):** Selected by the instructional design team and the instructor of record. Suggested text: Hassard, J. 2000. *Minds-on Science*

**Library Review:** A review of literature will be required to support the action research project. *Journal of Research in Science Teaching, Journal of Science and Mathematics, Science and Children, Science Education, The Science Teacher*

**Other Required Software, Materials and Equipment:** Additional materials may be selected by the instructional design team and the instructor of record.

**Statement on Non-Discrimination:** Missouri’s public universities are equal-opportunity educational institutions and do not discriminate on the basis of race, color, national or ethnic
origin, religion, sex, or sexual orientation for programs, activities, or employment, in accordance with the Civil Rights Act of 1964 and title IX of the Educational Amendments.

Statement on Academic Honesty: Missouri’s public universities are committed to intellectual integrity in their academic pursuits. Academic dishonesty constitutes unacceptable behavior and includes unauthorized assistance in completing required course assignments or testing. Unauthorized assistance includes electronic transfer. Plagiarism, that is, submitting someone else’s work or part thereof, as your own, is considered to be cheating.

Breaches of intellectual integrity will result in disciplinary measures, based on the policies and procedures of the student’s home institution. These may include:
1) a failing grade for a particular assignment;
2) a failing grade for the course;
3) suspension for various lengths of time from the university, and/or
4) permanent expulsion from the university

Statement on Student Disabilities: Reasonable accommodations will be provided upon request for persons with disabilities in accordance with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act of 1990. If you are a person with a disability, either learning related or physical, who requires an accommodation to participate in university programs, services, or activities please contact the disability services staff at your university of record.

Expected Enrollments: 20-25

Special Fees: None

Bibliography: To be determined by the instructional design team and the instructor of record.