Miami Dade College

GENERAL INFORMATION	
Course Prefix/Number: SCE4363	Course Title: **Advanced Topics in Science Education Practicum**
Number of Credits: 3 credits	
Degree Type	☐ B.A. ☐ B.S. ☐ B.A.S ☒ A.A. ☐ A.S. ☐ A.A.S. ☐ C.C.C. ☐ A.T.C. ☐ V.C.C
Date Submitted/Revised: 2/29/12	Effective Year/Term: 2012-1
☐ New Course Competency ☒ Revised Course Competency	
Course Description (limit to 50 words or less): The student will learn to conduct classroom research. The student will use action research strategies to identify and address issues related to science learning and students' science misconception in grades 6-12. Sixty hours of clinical experience are required. (3 hr. lecture)	
Prerequisite(s): SCE4362, SCE3893	Corequisite(s):

Competencies:

Competency 1:
The student will evaluate the significance of educational research to the teaching and learning of science by:

1. Identifying current educational research pertaining to instructional strategies for science
2. Summarizing and critiquing a minimum of 5 articles from a refereed science education journal.
3. Identifying the parts of a refereed journal article and stating the purpose, methodology, result, and conclusion.
4. Utilizing the library and electronic databases to find specific information about current science educational research in refereed journals.
5. Applying research-based instructional practices for developing students' critical thinking and conceptual understanding of scientific concepts.
6. Developing a repertoire of teaching practices that are congruent with current science educational research and personal teaching philosophies.

Competency 2:
The student will design and manage science learning environments which are responsive to the needs and abilities of all students by:

1. Exploring the current literature/research related to science education and design activities that will enable all students to improve their conceptual understanding of scientific concepts.
2. Delivering engaging and challenging inquiry-based lessons.
3. Constructing and implementing methods of assessment (formative and summative) for a science unit plan with daily lesson plans.
4. Analyzing the needs of students as demonstrated through their classroom behavior and performance on

pre and post data assessment tools.

5. Selecting teaching and assessment strategies that support the development of student understanding and nurturing a community of science learners.
6. Designing appropriate learning activities/instruction that address the current literature/research related to science education and designing activities that will enable all students to improve their conceptual understanding of scientific concepts to achieve mastery.
7. Developing and/or selecting and using instructional content, materials, resources, and strategies that respond to cultural, linguistic, communication, disability, and gender differences which are aligned to the State and National Standards and incorporate inquiry.
8. Designing, sequencing, and implementing appropriate lesson plans and instructional units that incorporate inquiry to carry out the goals and objectives of the State and National Standards.
9. Identifying gaps in students' subject matter knowledge.
10. Modifying instruction to respond to preconceptions or misconceptions.

Competency 3:
The student will design and manage a variety of classroom demonstrations, field experiences and laboratory experiments to enhance specific instructional objectives and address the needs and abilities of all students by:

1. Exploring the current literature related to science education and designing classroom demonstrations, field experiences and laboratory experiments that will enable all students to improve their conceptual understanding of scientific concepts
2. Planning and implementing an inquiry laboratory experiment and lessons to address the common misconceptions that are held by the students they teach.
3. Developing learning experiences that require students to demonstrate a variety of applicable skills and competencies.
4. Constructing and implementing methods of assessment for a science unit plan with daily lesson plans including home learning and laboratory/field situations as appropriate.
5. Engaging students successfully in developmentally appropriate inquiries that require them to develop concepts and relationships from their observations, data, and inferences in a scientific manner.
6. Observing and analyzing the effectiveness of science teachers' strategies and procedures for managing laboratory and hands-on science lessons.
7. Analyzing a variety of classroom demonstrations, field experiences and laboratory experiments for safety concerns and planning effective strategies for avoiding accidents.
8. Discussing the legal issues associated with laboratory and field trip experiences.
9. Creating an educational climate that fosters openness, inquiry and concern for others.

Competency 4:
The student will effectively communicate with parents, students, community partners, and school-based colleagues by:

1. Communicating and sharing action research findings accurately and effectively orally and in writing.
2. Creating a science safety contract and letter.
3. Observing and identifying techniques for leading effective classroom discourse.
4. Providing students with clear and specific instructions for completing lesson activities, especially in the laboratory.
5. Orchestrating discourse among all students about scientific ideas and processes.
6. Facilitating ongoing formal and informal discussion based on a shared understanding of rules of scientific discourse.

7. Utilizing verbal, nonverbal, and written language effectively.
8. Interacting with colleagues, supervisors, and students to develop effective lesson plans.
9. Interacting effectively with colleagues, parents, and students, mentoring new colleagues, and fostering positive relationships with the community.
10. Integrating information and feedback from students, faculty supervisors, cooperating teachers, and others to improve their teaching and student learning.
11. Maintaining a climate of openness, inquiry, fairness and support.
12. Collaborating with the home, school and larger communities to foster communication and to support student learning and continuous improvement
13. Supporting, encouraging, and providing immediate and specific feedback to students to promote student achievement.
14. Sharing the importance and outcomes of student assessment data with the student and the student's parent/caregiver(s).

Competency 5:
The student will assess the learning of their students to guide their teaching by:

1. Selecting appropriate formative assessments to monitor learning.
2. Designing and aligning formative and summative assessments that match learning objectives and which lead to mastery.
3. Applying technology to organize and integrate assessment information.
4. Examining and utilizing data-informed research to improve instruction and student achievement.
5. Utilizing a variety of assessment tools to monitor student progress, achievement and learning gains.
6. Modifying assessments and testing conditions to accommodate learning styles and varying levels of knowledge.
7. Utilizing student feedback to monitor instructional needs and to adjust instruction.
8. Utilizing student data, observations of teaching, and interactions with colleagues to report student achievement and opportunities to learn, to students, teachers, parents, policy makers, and the general public.
9. Utilizing multiple methods and systematically gathering data about student understanding and ability.
10. Utilizing multiple assessment tools and strategies to achieve important goals for instruction that which are aligned with methods of instruction and the needs of students.
11. Utilizing a variety of data, independently and in collaboration with colleagues, to evaluate student learning outcomes, adjust planning and continuously improve the effectiveness of lessons.
12. Analyzing assessment data and using the results of these multiple assessments to guide and modify instruction, the classroom environment, or the assessment process.
13. Analyzing and applying data from multiple assessments and measures to diagnose students' learning needs, informing instruction based on those needs, and driving the learning process.
14. Utilizing the results of assessments as vehicles for students to analyze their own learning, engaging students in reflective self-analysis of their own work.
15. Reflecting constantly upon their teaching and identifying ways and means through which they may grow professionally.

Competency 6:
The student will reflect on the importance of continuous personal and professional growth and change to meet the needs of their student, school community, and profession by:

1. Exploring the theoretical and practical literature related to effective learning environments and design

and establishing a classroom environment that is conducive to the high achievement of all students
2. Conducting an action research project at their field experience site in order to identify aspects of the educational process they wish to enhance.
3. Implementing an action research project to develop skills for implementing the education change.
4. Utilizing student data, observations of teaching, and interactions with colleagues to reflect on and improve teaching practice.
5. Using the results of multiple assessments and data (both qualitative and quantitative) as part of their action research project to guide and modify instruction to shape learning experiences for students, keeping in mind both cultural and political influences.
6. Utilizing information from students, supervisors, colleagues and others to improve their teaching and facilitate their professional growth.
7. Engaging in self-reflection regarding research-based performance and pursuing opportunities for feedback to demonstrate commitment to continuous improvement in effective goal-setting through a professional development plan.
8. Engaging in targeted science education professional development activities sponsored by National, State, and/or Local professional organizations and reflective practices.
9. Participating in science teaching professional organizations and conferences.
10. Designing purposeful professional goals to strengthen the effectiveness of instruction based on students' needs.
11. Implementing knowledge and skills learned in professional development in the teaching and learning process.

Competency 7:
The student will understand that educators are held to a high moral standard in a community by:

1. Adhering to the Code of Ethics and the Principles of Professional Conduct of the Education Profession of Florida, pursuant to State Board of Education Rules 6B-1.001 and 6B-1.006, F.A.C, and fulfilling the expected obligations to students, the public and the education profession.