Division: Teacher Education
Program Area: Science Education
Course Information: SCE 5070-001
Duration: January 08, 2014 – April 30, 2014
Course Credit: Three Semester Hours
Term/Year: Winter 2014
Course Location: Room 255, College of Education
Days: Wednesdays
Time: 5:00-7:45 PM
Science Educator: Dr. Jazlin Ebenezer
Office Address: Room 299, College of Education
Office Hours: Wednesdays 3:00 – 5:00 PM
Call 313/577-0991 for appointments
Office Phone #: 313/577-0918
Fax: 313/577-4091
Email: aj9570@wayne.edu
Website: http://blackboard.wayne.edu/
Course Description

Innovations and improvements in school science teaching and learning. Exploration of appropriate areas of study, development and selection of learning activities and materials.

Course Outcome

This course will develop your knowledge and ability to conduct, represent, and communicate scientific and engineering practices as emphasized in the “A Framework for K-12 Science Education” (NRC, 2011). Specifically, you will know and be able to:

3. Design a prototype using engineering design process.
4. Demonstrate evidence of your science and engineering knowledge, understanding, and skills through written examination and class presentation.

Required Reading

Next Generation Science Standards (Achieve, 2013)
Science Education research papers on teaching and learning

Course Requirements and Assessment Criteria:

Assignment 1: A Theoretical Paper(40 points)
Write a scholarly paper based on the above readings to support your lesson sequence (see assignment 2). Support your claims with evidence and examples (10 pages long, double spaced without references; complete citations and references in APA format). Read the literature that supports the national documents.

Assignment 2: Assessment-embedded science and engineering lesson plans (40 points)
Design four assessment-embedded science and engineering detailed lesson plans that support three dimensions outlined in NRC 2012 and STEM knowledge and processes outlined in the standards document Achieve, 2013. Upload your lesson plans on the BB. Also you will do a class presentation of your lesson plans.

You will be graded based on the evidence of your in-depth understanding of the reform documents and the translation of these documents in the design and development of your lesson plans.
Assignment 3: Design of a prototype using engineering design process (20 points)

Write a design brief and develop a prototype based on engineering design principles and processes that support STEM knowledge to solve a real world problem. This design prototype should characterize the expectations of grade appropriate content and pedagogical practices outlined and discussed in NRC (2012) and Achieve (2013). Upload your design brief on BB. Share your prototype in a class.

You will be graded based on the evidence of your in-depth understanding of the reform documents and the translation of this document in the design and development of a prototype.

Grades will be assigned as follows:

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<tr>
<th>Percentage Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>93-100 %</td>
<td>A</td>
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<tr>
<td>90-92 %</td>
<td>A-</td>
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<td>87-89%</td>
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<td>77-79 %</td>
<td>C+</td>
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<td>73-76 %</td>
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Topics and Class Schedule (Tentative):

January 08: Introduction

January 15: Guiding assumptions and organization of the framework

January 22: Library Reading

January 29: Dimension 1: Scientific and engineering practices

February 05: Dimension 2: Crosscutting concepts

February 12: Dimension 3: Disciplinary core ideas: Physical sciences

February 19: Dimension 3: Disciplinary core ideas: Life sciences

February 26: Dimension 3: Disciplinary core ideas: Earth and space sciences

March 05: Dimension 3: Disciplinary core ideas: Engineering and technology

March 12: Spring Break
March 19: Implementation, Assignment 1 due

March 26: Diversity and Equity

April 02: Presentation

April 09: Presentation

April 16: Presentation

April 23: Presentation

April 30: Assignments 2 and 3 due

Overview of Course Procedures and Policies

Communication
Class communication will utilize Blackboard and the class e-mail list. Students must be able to access the course Blackboard site to retrieve important information about the course, as well as email messages. This syllabus will be posted on the Blackboard site, along with assignment details and other communications. The site may be entered through http://wayne.edu and then clicking on WSU Pipeline. WSU provides free email and Internet accounts for students.

Attendance
Because each class session is almost three hours long, and so much material is covered in each session, class attendance and timely arrival to class is expected and required. When circumstances do occur, students must communicate with the professor in advance of any anticipated absence or late arrival to class.

Attendance will be taken at the beginning of each class. If you come to class after 10 minutes of the scheduled time, you will be marked tardy. Three late arrivals to class or early departures from class will count as one absence.

Absences will be excused under certain circumstances such as illness and death in the family. However, you are responsible for providing me with such evidence. Absentees are responsible for: (1) getting any handouts passed out during the missed class, (2) any in-class announcements, (3) changes in syllabus, and (4) material discussed in class. There will be no make-up of activities missed.

Please arrive to class on time. Any class announcements are usually given at the beginning of class, which you will miss if you arrive late. Late arrivals and early departures are also disruptive to everyone in class.

Absence will significantly affect your grade, your learning, and ultimately your grade.
**Cell Phone**  
PLEASE TURN OFF YOUR CELL PHONES BEFORE ENTERING THE CLASS. Under no circumstances are cell phones to be used inside the classroom.

**Plagiarism**  
Plagiarism includes copying material (any more than 5 consecutive words) from outside texts or presenting outside information as if it were your own by not crediting authors through citations. It can be deliberate or unintended. If you're in doubt about the use of a source, cite it. Students caught plagiarizing information from other sources will receive a failing grade in the course. University policy states that students can be subject to multiple sanctions, from reprimand to expulsion as a consequence of academic dishonesty. To enforce this policy, all outside references must be submitted with assignments.

**General Note on Grading**  
The College of Education faculty members strive to implement assessment measures that reflect a variety of strategies in order to evaluate a student's performance in a course. For graduate students B grades will be awarded for satisfactory work that satisfies all course requirements; B+ grades will be awarded for very good work, and A grades will be reserved for outstanding performance. Please note that there is a distribution of grades from A-F within the College of Education and that plusses and minuses are recorded and distinguish distinct grade point averages.

**Enrollment/ Withdrawal Policy**  
Beginning in Fall 2011, students must add classes no later than the end of the first week of classes. This includes online classes. Students may continue to drop classes (with full tuition cancellation) through the first two weeks of the term.

Students who withdraw from a course after the end of the 4th week of class will receive a grade of WP, WF, or WN.
- WP will be awarded if the student is passing the course (based on work due to date) at the time the withdrawal is requested
- WF will be awarded if the student is failing the course (based on work due to date) at the time the withdrawal is requested
- WN will be awarded if no materials have been submitted, and so there is no basis for a grade

Students must submit their withdrawal request on-line through Pipeline. The faculty member must approve the withdrawal request before it becomes final, and students should continue to attend class until they receive notification via email that the withdrawal has been approved. Beginning in Fall 2011, the last day to withdraw will be at the end of the 10th full week of classes. The withdrawal date for courses longer or shorter than the full 15-week terms will be adjusted proportionately.

**Attention Students with Disabilities**
If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TDD only). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services’ mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.

Please be aware that a delay in getting SDS accommodation letters for the current semester may hinder the availability or facilitation of those accommodations in a timely manner. Therefore, it is in your best interest to get your accommodation letters as early in the semester as possible.

**Religious Observance Policy**

Because of the extraordinary variety of religious affiliations represented in the University student body and staff, the Wayne State University calendar makes no provision for religious holidays. It is University policy, however, to respect the faith and religious obligations of the individual. Students who find that their classes or examinations involve conflicts with their religious observances are expected to notify their instructors well in advance so that alternative arrangements as suitable as possible may be worked out.