Division: Teacher Education
Program Area: Science Education
Course #: SCE 5010-003
Course Title: Biology for Elementary and Middle School Teachers
Course Credit: Three Semester Hours
Section #: Call # 20498
Term/Year: Winter 2014
Course Location: Room 253, College of Education
Days: Mondays Time: 5:00 PM – 7:45 PM
Instructor: Joy Reynolds
Phone: 313-577-0902 (College of Education Secretary)
Email: ag6799@wayne.edu Website: http://blackboard.wayne.edu
Office Hours: Before or after class arranged before class

Course Description:
This course covers significant biological principles, generalizations, and understandings with relation to their use with children in elementary and middle school. Appropriate learning activities, experiments, field trips, text and reference materials, technological applications, and evaluation are used.
Student Outcomes:

As a result of participating in the activities related to this course, the students should be able to:

1. Know, understand and apply basic concepts and principles related to life science.
2. Related their understanding of life science to current societal issues.
3. Use inquiry to learn about natural phenomena – design and conduct investigations on topics related to life science using appropriate methodology and technology.
4. Apply mathematics in the collection, analysis and interpretation of data.
5. Communicate findings using appropriate technologies.
6. Learn from various sources (professional journals, textbooks, the Internet and the community) and reconstruct previously learned knowledge.
7. Develop a more positive and enthusiastic attitude about life science.

Course Philosophy:

The class involves discussion of major biological concepts, principles and generalizations interspersed with group activities addressing science as a process. These activities stress learning science through inquiry. The new National Science Standards call for the use of inquiry as a means for learning/teaching science in grades K-12. In order for teachers to use this approach in their own teaching, they must become thoroughly comfortable with it through their own learning.

We also try to integrate various subject areas such as math, language, and social studies in the teaching/learning of science. Science is perhaps the best subject for the development of an integrated curriculum. I hope in this course you will become familiar with some of the ways in which this can be done.

Required Text(s) and Material:

No textbook is required for this course. All the readings, activities and assignments are in the course’s Blackboard site. However, I encourage you to download the course materials from the Blackboard site and organize them by topic in a 3-ring binder to study from. You are also required to organize all the materials in the Blackboard site into a CD ROM. I will go over your CD ROM while you take the mid-term exam.

For additional information on the topics we cover you may check an on-line biology book by clicking on the following link (this link is also listed under “external links” on the course’s Blackboard site): (http://www.emc.maricopa.edu/faculty/farabee/BIOBK/BioBookTOC.html)
Policies:

Because each class meeting is almost three hours long, and so much material is covered in each meeting, it is essential that you attend each class to do well in the course. Attendance will be taken at the beginning of class. Absences will be excused under certain circumstances such as illness and death in the family when the student provides the instructor with evidence of such emergencies. Excused absences will be by notes from doctor or other relevant official. 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. Class announcements are given at the beginning of class, which you will miss if arriving late. Late arrivals are also disruptive to everyone in class. PLEASE TURN OFF YOUR CELL PHONES BEFORE ENTERING THE CLASS AND STORE THEM AWAY.

Grading System:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Attendance and Participation</td>
<td>30 pts</td>
</tr>
<tr>
<td>Two Exams</td>
<td>214 pts</td>
</tr>
<tr>
<td>Willie the Hamster Homework</td>
<td>25 pts</td>
</tr>
<tr>
<td>Field Trip in Class Assignment</td>
<td>50 pts</td>
</tr>
<tr>
<td>Field Trip Homework</td>
<td>50 pts</td>
</tr>
<tr>
<td>Concept Map</td>
<td>40 pts</td>
</tr>
<tr>
<td>Science Model</td>
<td>60 pts</td>
</tr>
<tr>
<td>Research Project</td>
<td>55 pts</td>
</tr>
<tr>
<td>Design – 10 pts</td>
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<tr>
<td>Presentation 20 pts</td>
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<tr>
<td>Final Report 25 pts</td>
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</tbody>
</table>

1. Class Participation, Readings, In-class Activities, and Homework: Consideration will be given to attendance, participation in class discussions and in-class activities, quality of homework and entries on the discussion board. Your attendance and promptness is important.

2. Course Assignments:

A. Concept Map: Choose a topic within life science and use the software Inspiration to draw a concept map that shows the interrelationships among its various concepts. Please refer to the guidelines and grading rubric provided for the assignment.

B. Science Model: Choose a topic or major concept covered in class and develop a model that can be used to help explain the topic/concept. Refer to the guidelines and grading rubric provided for the assignment.

C. Research Project: Given a research question and hypothesis within a life science topic, design and carry out an experiment that will allow you to test that hypothesis. Share the results of your
experiment with others through a Power Point Presentation and write a final report using the guidelines provided for the assignment. **Please refer to the guidelines and grading rubric provided for all the aspects of this assignment.**

D. **Exams:** There will be two exams in this course. The examinations are a combination of multiple-choice, short answer, and essay items. The material for each examination will include items from class activities, handouts, and articles assigned for reading. The second exam will cover only the biological concepts and activities presented after the first exam. **A study guide will be available before each exam.**

**Things to keep in mind:**

- The instructor will provide criteria and a grading rubric for each assignment. These criteria are located under “Assignments” in the course’s Blackboard site and should be used as guidelines for what the instructor expects in each assignment.

- Assignments may be sent to the instructor electronically before class begins on the date the assignment is due or turned on the due date at the beginning of class.

- Late assignments will decrease in point value by 5% of the allocated points for each day the assignment is late.

- To meet professional quality and presentation standards required of practicing teachers, assignments will be graded on clarity of ideas, grammar, spelling, and adequate word choice. **Assignments must be typed on a word-processor.**

**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. **Please read the handout titled “Plagiarism” under “Assignments” on the course’s Blackboard site.**

**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 undergraduates and post-degree students C 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. [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.
The mark of I – Incomplete is intended to allow a student to complete the required work for a course after the semester has ended, if, in the judgment of the instructor, there is a legitimate reason why the work could not have been completed during the term. Incompletes (I) may be given only when the student has not completed all of the required work and when there is a reasonable probability that the student will complete the requirements successfully without again attending regular class sessions. If additional class attendance is required, the student must reregister for the course. The student must be passing at the time the Incomplete is given. "Grades of Incomplete “I.” All students are expected to complete the course by the end of the semester. If during the semester you feel that at this time you can not handle the amount of work required for this course, please drop the class. A grade of incomplete “I” will be given only to a student who is doing well in the course and who, due to unforeseen circumstances such as a serious accident, is unable to complete all the course assignments. A grade of incomplete will not be given to a student who at the time of the request is failing the course."

MTTC Tests - Michigan Test for Teacher Certification

In the state of Michigan, a pre-service teacher must take and pass a test in each of the content areas in which s/he plans to be certified. At Wayne State University, passing the MTTC tests is a requirement to the student teaching field experience. As a result, it is imperative that pre-service teachers prepare for the tests. There are a number of resources available to teachers to help them prepare for the tests. First, students should check the MTTC Tests website: http://www.mttc.nesinc.com/index.asp to find out test schedules, how to register for the tests, test objectives and other pertinent information. Second, students must study for the tests. Even if you have a major in a subject area the chances are you have forgotten most of what you once learned. Therefore, you need to go over the information for a fresh understanding of the concepts in order to pass the tests. The tests usually cover the basic information in a content area and going over a freshman biology, chemistry, or physics textbook and relearning the concepts related to that specific test’s objectives will maximize the chances of succeeding. If you do not have access to such textbooks, you might want to search for some free textbooks online. Below are a few links to online textbooks.

- Biology http://www.emc.maricopa.edu/faculty/farabee/BIOBK/BioBookTOC.html
- Chemistry http://library.thinkquest.org/3659/
- Earth Science http://www.solarviews.com/eng/earth.htm
- Physics and Astronomy http://www.lightandmatter.com/

In addition to reviewing the material from a basic textbook, study guides are excellent resources to prepare for these tests. The following websites have study guides that students may purchase at an affordable price:

- Mo-Media - http://www.mo-media.com/mttc/ - have study guides in all areas including Integrated Science.
- Amazon also has a variety of study guides - http://www.amazon.com/s/?ie=UTF8&keywords=mttc+study+guides&tag=googydr-20&index=aps&hvadid=1147468841&ref=pd_sl_9caca812mo_b -

Remember the key passing the tests is preparation. The sooner you pass the tests the sooner you will be able to get your teaching certification.
Grades will be assigned as follows: Undergraduate

93-100 % = A
90-92 % = A-
87-89% = B+
83-86 % = B
80-82 % = B-
77-79 % = C+
73-76 % = C
70-72 % = C-
67-69 % = D+
63-66 % = D
60-62 % = D-
Less than 60% = F

Grades will be assigned as follows: Graduate

93-100 % = A
90-92 % = A-
87-89% = B+
83-86 % = B
80-82 % = B-
77-79 % = C+
73-76 % = C
70-72 % = C-
Less than 69% = F

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 undergraduates and post-degree students C 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. [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.

WITHDRAWAL POLICY
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. Withdrawals can be requested at any point from the fifth week of class to the end of the 9th week.

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. http://studentdisability.wayne.edu/

Religious observance: 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 may be worked out.

ACADEMIC SUCCESS:
The Academic Success Center in the Adamany Undergraduate Library provides tutoring by appointment at no cost as well as training in areas such as time management, study and testing skills. Contact Info.: Tel. 313/577-3165 Web. http://www.success.wayne.edu/ Do visit the Success center if you begin having difficulty in any of the courses you are taking.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic Considered:</th>
<th>Blackboard Readings/Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Jan 6</td>
<td><strong>Orientation/syllabus</strong></td>
<td>Syllabus</td>
</tr>
<tr>
<td>2 Jan 13</td>
<td><strong>Science Processes – Research Project</strong></td>
<td>Handouts</td>
</tr>
<tr>
<td>3 Jan 20</td>
<td><strong>No Class - Martin Luther King Day</strong></td>
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<tr>
<td>4 Jan 27</td>
<td><strong>Classification</strong></td>
<td>Handouts</td>
</tr>
<tr>
<td>5 Feb 3</td>
<td><strong>Producers and Consumers</strong></td>
<td>Handouts</td>
</tr>
<tr>
<td>6 Feb 10</td>
<td><strong>Natural Resources</strong></td>
<td>Handouts</td>
</tr>
<tr>
<td>7 Feb 17</td>
<td><strong>Class will not meet on campus</strong></td>
<td>Handouts</td>
</tr>
<tr>
<td>8 Feb 24</td>
<td><strong>Transport</strong></td>
<td>Handouts</td>
</tr>
<tr>
<td>9 Mar 3</td>
<td><strong>Online Midterm</strong></td>
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<tr>
<td>10 Mar 10</td>
<td><strong>Spring Break - no class</strong></td>
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<tr>
<td>11 March 17</td>
<td><strong>Photosynthesis/Respiration</strong></td>
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<tr>
<td>12 Mar 24</td>
<td><strong>Nutrition</strong></td>
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<td></td>
<td><strong>Microbes</strong> (viruses, bacteria and full benefits and harm)</td>
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<tr>
<td></td>
<td>Economic impact</td>
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<td></td>
<td><strong>A Balanced Diet - Major Food Groups</strong></td>
<td></td>
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<tr>
<td></td>
<td>Role of nutrients in the human body</td>
<td></td>
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<tr>
<td></td>
<td>Eating disorders</td>
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</tr>
<tr>
<td>Date</td>
<td>Topic</td>
<td>Notes</td>
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<tr>
<td>Mar 31</td>
<td>Excretion</td>
<td>Handouts</td>
</tr>
<tr>
<td>April 7</td>
<td>Variation and Heredity</td>
<td>Handouts <em>Science Model Due</em></td>
</tr>
<tr>
<td>April 14</td>
<td>Research Project</td>
<td>Report on your research project due</td>
</tr>
<tr>
<td>April 21</td>
<td>FINAL EXAM (same time as class)</td>
<td>Online - class will not meet on campus</td>
</tr>
</tbody>
</table>

All work must be sent to me by 7 pm April 24th to be considered for a grade.

**REFERENCES**

The following list of science activity books, journals, and other resources will be useful to you as a teacher. Add to the list as you encounter additional ones and start a file for your future use. You will find it very useful once you become a teacher.

**Science Education Journals**

- *Science and Children*
- *Science Scope*
- *Science Teacher*
- *Teaching K-8*
- *Creative Classroom*
- *Wonder Science*

**Community Resources**

**Michigan Science Center.** 5020 John R. (Corner of John R and E. Warren). Tel.(313) 577-8400. [http://www.mi-sci.org](http://www.mi-sci.org)


Michigan Department of Natural Resources. http://www.michigan.gov/dnr/
You will find many resources at this site.

Consider becoming a member of science organizations such as:

<table>
<thead>
<tr>
<th>Organization</th>
<th>Web Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan Science Teachers Association (MSTA)</td>
<td><a href="http://www.msta-mich.org/">http://www.msta-mich.org/</a></td>
</tr>
<tr>
<td>Metropolitan Detroit Science Teachers Association (MDSTA)</td>
<td><a href="http://www.mdsta.org/">http://www.mdsta.org/</a></td>
</tr>
<tr>
<td>National Science Teachers Association (NSTA)</td>
<td><a href="http://www.nsta.org/">http://www.nsta.org/</a></td>
</tr>
</tbody>
</table>

Books


Bosak, S. V. (Latest edition). Science is.... Markham, Ontario: Scholastic Canada, Ltd.


Thier, H.D. et. al. (1978). *The Science Curriculum Improvement Study (SCIS)* (SCIS)° (see K-6 modules on Organisms, Life Cycles, Populations, Environments, Communities, and ecosystems).

