EDCI 670: Trends in School Curriculum (Science) (3 credits)

Professor: Dr. J. Randy McGinnis  
Class Hours: M: 4:15pm-7:00pm
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Office Hours: by appointment
Web sites: ELMS

Overview

The focus of this course is on trends in the development of curriculum in science education as influenced by ideas (theoretical and methodological) from education research. It is a course that is discussion-based in which students critically examine science curricula to determine how they may support the learning of science.

Theoretical Foundation of Course

This course is based on a professional knowledge for teaching based on research that has the following components:

Knowledge of curriculum: The scope and sequence of programs and materials designed for teaching science.
Knowledge of learners: Information about/or characteristics of individuals and groups learning science in learning contexts.
Knowledge of educational goals and assessment: Identification of instructional objectives, methods of monitoring and adjusting instruction, and the evaluation of student progress.
Knowledge of social contexts: An understanding of how classroom, school goals, and learning fit into the issue of community, culture, values and the realities of the outside world.
Knowledge of pedagogy: The strategies, techniques, models and theories of teaching and learning of science.
Knowledge of content: The facts, concepts, and structures within science that guide investigation in science teaching/learning.

Class Materials:

I. Required:
Books

**Journal Articles**

Please refer to the articles listed in the “Schedule of classes” section.

**II. Optional Book**


**Journal Articles**

There are many additional optional relevant readings and materials found under the professor’s name in the Curriculum materials laboratory (basement of Benjamin). These readings are a compilation of journal articles and curricula material related to science education that faculty in the UM Science Teaching Center have collected over the last 40 years.

**Performance Objectives:**

Upon completion of this course, you should be able to:
1. Lead a graduate level group discussion of a reading in science education.
2. Conduct a review of a science curriculum and present that review to a graduate level class.
3. Write a scholarly paper that investigates in detail a topic in science education and makes connection to curriculum and practice.

**Course Assignments And Grading:**

1. **Professional Participation** (25%): Contribute regularly to the class discussions and lead two graduate level group discussions on readings. Each week you should bring to our class session a pithy (1 to 2 pages) reaction paper in response to the readings of the week. These reaction papers provide an opportunity for you to summarize the ideas and information presented in the readings and state your analysis/reaction to them.

2. **Review of a science curriculum** (25%): Prepare a written review of a science curriculum (that you select in consultation with your professor), and present this review to the class (45 minutes in duration). This review of a curriculum should include a written product that contains an introduction that states the theoretical rationale for the curriculum, a summary of the science content included in the curriculum, and your professional reaction of the curriculum. [Due: 11/15/10]

3. **Theory and curriculum paper** (50%): Select a contemporary topic in science education and prepare a concise scholarly paper (15 to 20 pages) that investigates in detail that topic (including a literature review of the most seminal and influential papers). Your paper should 1) synthesize research/thoughts in this area (with a minimum of 10 references), and 2) suggest some implications for curriculum and practice in science
education based on the topic. On the last day of class, you will share with the class what you learned from your scholarly research paper [Due: 12/6/10]

Final course grades:

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<thead>
<tr>
<th>Grades</th>
<th>Percentage Range</th>
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<tbody>
<tr>
<td>A+</td>
<td>100%-99%</td>
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<tr>
<td>A</td>
<td>98-92%</td>
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<tr>
<td>A-</td>
<td>91-90%</td>
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<tr>
<td>B+</td>
<td>89-88%</td>
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<tr>
<td>B</td>
<td>87-82%</td>
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<tr>
<td>B-</td>
<td>81-80%</td>
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<tr>
<td>C+</td>
<td>79-78%</td>
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<tr>
<td>C</td>
<td>77-72%</td>
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<tr>
<td>C-</td>
<td>71-70%</td>
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<tr>
<td>D+</td>
<td>69-68%</td>
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<tr>
<td>D</td>
<td>67-62%</td>
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<td>D-</td>
<td>61-60%</td>
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<td>F</td>
<td>&lt;59%</td>
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Documented Disability Disclosure
In compliance with and in the spirit of the Americans With Disabilities Act (ADA), I would like to work with you if you have a documented disability that is relevant to your work in this course. If you wish to discuss academic accommodations, please contact me within the first two weeks of the semester.

Additional Important Information
1. Attendance
Your participation is a vital aspect of this course. Please bring to the instructor’s attention ahead of time any conflict between class meeting times and other commitments (e.g., religious observations or medical appointments), so that additional arrangements can be made.

2. University Honor Code
The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit [http://www.studenthonorcouncil.umd.edu/whatis.html](http://www.studenthonorcouncil.umd.edu/whatis.html)
Schedule of Classes *(Subject to adjustment as conditions warrant)*

Note: The readings are due on the day they are cited in this schedule. Readings preceded by * are provided by the instructor.

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic(s)</th>
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<tbody>
<tr>
<td>#1</td>
<td>Philosophy/Epistemology and Science Education</td>
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<tr>
<td>(8/30/10)</td>
<td>Introductions/Overview of course</td>
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<tr>
<td>#2</td>
<td>Science Curriculum Development: History and Theory</td>
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<tr>
<td>(9/13/10)</td>
<td>Readings:</td>
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<tr>
<td>#3</td>
<td>Sample Science Curriculum: Climate Change Module for Teacher Candidates</td>
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<tr>
<td>(9/20/10)</td>
<td>(Guest Presenter: Ms. Emily Hestness, US Peace Corps, DC)</td>
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<td>Readings:</td>
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<td>#4</td>
<td>Goals for Science Education and Science Content Framework</td>
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<tr>
<td>(9/27/10)</td>
<td>Readings:</td>
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<td>3. *Common Core Science Framework</td>
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#5 Nature of Science
(10/4/10)
Readings:

#6 Conceptual Change and Constructivism
(10/11/10)
Readings:

#7 Beyond Constructivism
(10/18/10)
Readings:

#8 Inquiry/Science as Practices
(10/25/10)

#9 Student Presentations: Review of Science Education Curricula
(11/1/10)

#10 Student Presentations: Review of Science Education Curricula
(11/8/10)
**Due:** Review of a science curriculum
#11 Equitable/Inclusive Science Education
(11/15/10)
Readings:
[pp. 205-216, Science for all.; pp. 57-97, Gender, Equity, Culture Ethnicity].

No Class Session 11/22/10

#12 Science-Technology-Society (STS) and the Socioscientific Issues Initiative
(11/29/10)
Readings:

(12/6/10)
Course Debriefing
Reading:
[pp. 231-244, Curriculum Change].
**Due: Theory and Curriculum Paper**