Leadership in Science Education
UML course # 04.675/031
Winter Session I 2010 • January 27th – April 7th (10 sessions)

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Classes will be posted on TUESDAYS BY 9 p.m.
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Course Overview

There are many issues in science education that can be clarified as a result of reading current literature and engaging in discussion with other teachers. In this course, we will examine some of the most pressing issues that face us as science teachers e.g. what is essential to know in science? What role should inquiry play in a science? Is ability grouping appropriate for learning in science? If science concepts can't be applied by students, should they be taught? This is the culminating course in the program and each week we will examine a different issue and share our expertise. Additionally, the ways in which you put your program learning into practice will be assessed through evidence captured in an electronic professional portfolio.

Required Texts

1. Rhoton, J. and Shane, P. (Eds.) (2006). *Teaching in the 21st century.* Washington, DC: NSTA Press.

2. Yager, R. *Exemplary science: Best Practices in Professional Development.* Washington, DC: NSTA Press.

3. NSTA Membership. Membership to NSTA.org is strongly recommended for access to articles and other resources.

Intended Learning Outcomes and Assessment

As you participate in this course you will be applying and evaluating the knowledge you have gained throughout your program. The assignments therefore assess your ability to clearly articulate an informed position. Additionally, you will be documenting your practice through the development of a professional portfolio.

Graduate School of Education's Conceptual Framework: Education for Transformation

The central tenets of our conceptual framework are Excellence, Equity, Inquiry and Collaboration. In this course you will visit each of these areas in a variety of ways:

Excellence: You will learn about the qualities of high-quality science instruction and how high standards of excellence in science should be a goal all for all children.
Equity: All children can learn science; all children can meet high standards. This course will help you think about ways to differentiate science instruction to make it accessible to all.
Inquiry: Science instruction should be centered around inquiry. We'll discuss leadership steps you can take to create meaningful and relevant science experiences for students
Community: Science literacy should be the goal for all students. By working together to build-upon others' ideas, students will be the concepts and skills necessary to develop life-long literacy in science.

Summary of Learning Outcomes and Assessment

Learning outcomes – Your learning in this course will result in you being able to:	Assignments
Articulate an informed position on topics of particular interest to you as a classroom science teacher – demonstrating your ability to synthesize opinions and evaluate research.	**ASSIGNMENT 1: Position Papers (Summative)** Four position papers At least 10 different topics will be discussed in this course. You will choose 4 of these topics to write positions papers on following class discussion of the topic. **20 Points** **ASSIGNMENT 2: Writing/Submission of Science Teaching Article (Formative)** You will write a brief article about excellent science teaching practice, review criteria, and submit it for publication. **10 points**

Document your own teaching strengths and communicate your skills effectively to others.	**ASSIGNMENT 3: Electronic Portfolio (Formative)** Electronic portfolio posted to course website. This will include a VIDEO of your teaching, part of which we shall digitize and add to your electronic portfolio. Will be reviewed by peers and by the instructor. **40 points**
Present your ideas to others and respond to their opinions with careful reflection and knowledge.	**ASSIGNMENT 4: Online Discussions (Summative)** Throughout the course you will contribute to online discussions, chat and email. These discussions will require significant thought and synthesis. **20 points** **ASSIGNMENT 5: Introduce, Lead, and Discuss Topic (Formative)** You will create 1-3 pages, which introduces your peers to a topic of interest in science education. You will develop discussion questions and lead the Discussion Board. **10 points**

Course Grading Scheme

There are five assignments for this course for a possible total of 100 points.

- **Assignment 1: 4 Position Papers = 20 points**
- **Assignment 2: Science Article = 10 points**
- **Assignment 3: Electronic Portfolio = 40 points**
- **Assignment 4: Participation by discussion, chat and email) = 20 points**
- **Assignment 5: Introduce, Lead, and Discuss Topic = 10 points**

Course Grading System

ALL ASSIGNMENTS, INCLUDING TIMELY POSTINGS ON THE DISCUSSION BOARD AND REQUIRED HOMEWORK, MUST BE SUBMITTED. If assignments are late or not submitted, the student may be advised to withdraw or run the risk of gaining a “below graduate standard” grade. INCOMPLETES will only be given if the student has documented evidence of illness or exceptional circumstances. Inability to keep-up with course work is not grounds for requesting an incomplete.

Although specific rubrics will be provided for assignments, the overall grading system for the course is based on the system below. Please note that the UMass system now uses the A+ to B system for graduate standard work.

Grade	***GPA***	***Point structure***	***Comment***
A+	4.0	99-100	Work of the highest professional standard demonstrating independent and exemplary performance
A	4.0	96-98	Excellent work demonstrating independent and high quality performance.
A-	3.7	91-95	Very good work, carefully executed, but requiring some areas of improvement.
B+	3.3	86-90	Good work, indicating careful thought and attention to the task, yet requiring several areas of improvement.
B	3.0	80-85	Work of graduate standard, but omissions exist or careful analysis is not in evidence.
Below Graduate Standard			
B-	2.7	76-79	Effort is evident, but work indicates lack of understanding of the demands of the task
C+	2.3	70-75	Poor quality work with little attention to detail and the demands of the task.
C	2.0	65-69	Work of very poor quality, indicating no understanding of the depth of analysis required.
F	0.0	Below 65	Serious neglect or evidence of cheating.

A Walk Through This Course…

This course will contain *two* components

1. Online Discussions and Meetings

What is expected of you	What you can expect from the instructor	Estimated amount of work time <u>per week</u>
• Get logged on during the first week of class. • Participate in weekly online discussions. Your posts should be meaningful, well thought-out, and articulate. • Post your first response by **Thursday** of each week. • Post your follow up responses (if appropriate) by **Sunday** • Use the site as a resource. • Share resources with your peers. • ***Have your reading done for the week*** • Hand in assignments (When appropriate) • Ask questions of the instructor • Interact with your peers in a positive manner	• Online components will be up and ready at appropriate time • I'll post weekly questions to reflect upon each week. These will be tied directly to our course topic for that week. • All course materials will be posted on the course site. • I'll add additional resources (when possible). • I'll check into the site several times during the week to check your progress.	3-4 hours for most weeks.

2. Assignments and Reading

What is expected of you	What you can expect from the instructor	Estimated amount of work time per week
• Consult the syllabus weekly to see what is due and what is expected of you. • Read weekly reading assignments. • Complete course assignments and turn in on time. • Ask questions about assignments (if necessary).	• Remind you when assignments are due. • Evaluate your work in a timely manner • Give you useful feedback • Give you feedback if I feel you're not doing what is expected of you.	3-4 hours per week.

Course Policies

Late policy: To pass this course, all assignments must be completed and turned in on the date required. For each day late the student forfeits 1 point from the assignment. In the event of illness, the student must contact the instructor.

Communication

There are four primary means of communication available to us:

1. Discussion board
2. WebCT E-mail
3. Chat (WebCT chat or Skype)
4. Telephone

Acceptable online behavior: Please remember to be respectful of your online classmates. Please use CAP LOCK only for emphasis. Personal slurs, derogatory remarks and bad language will not be tolerated. You will receive a personal email from me and at my discretion you may be dismissed from the online course with no refund of tuition and fees paid. However, it is perfectly acceptable to use humor and icons to designate a joke.

Discussion board: In this course, I hope to make good use of the discussion board. Sometimes I will give you a specific DAY and TIME by which I would like you to respond. There are 2 ways to access the Discussion area: Click on the "Discuss" icon at the top of the screen, this will open the discussion area for the current lesson, or Click on the "Communicate" button on the left side of the screen, then click on the "Discussion group" link."

On-line Attendance: You are expected to read and participate in all on-line sessions. You should know that this is a feature that instructors can check on WebCT (Instructors can view how often you visit, how long you're spending online, how many posts you've read and responded to, etc. In past experience, people who spend a good deal of time online are the most successful with online courses).

Incomplete Course Work: Extensions beyond the end of the course are only given in exceptional circumstances, and NOT because you could not keep up with the workload. Please ensure that you contact the instructor as soon as the emergency arises that you believe may warrant extended time.

ADD/DROP – WITHDRAW: It is your responsibility to inform the instructor and continuing studies if you wish to drop or withdraw from the course. You are required to adhere to the dates listed on the Continuing Education site under "Academic Calendar."

Assignment Policies

All assignments must be sent by submitted by **midnight** on the due date:

(i) Submitted as a document attached to an email (WORD or .RTF only) by 11:59 p.m. on due date
(ii) Make sure that **your name** is clearly stated IN THE DOCUMENT NAME
(iii) Put in the required drop box or post (depending on the requirements of the assignment.

The electronic portfolio will be posted to the course website.

Resubmissions

For the portfolio assignment (Assignment 2), if you fail to score a passing grade of 80%, you will be allowed to re-write aspects of the critique to raise your points to NO MORE than 80%.

For the other assignments, you MUST ensure that you understand the scope and depth of the assignment prior to submitting it.

Week-by-Week Overview
(Subject to change depending on class progress)

Date	Topics	Readings (To be completed before viewing online component)	Due This Week
Session 1 Jan 26	**Issue 1: How do the US science students compare with other countries?** **Publishing in Science Education** **Professional Portfolio – What do the NSES present as standards for science teaching?** What is a portfolio? Organization around professional practice standards	TIMMS resources (you choose what will be helpful to answer the Discussion Board Question). • NSES Standards (section about professional practice) • **Ch. 6 in Rhoton and Shane**	• Online work • Assignment 2: Submit ideas for articles.
Session 2 Feb 2	• **Issue 2 – Scientific Literacy – is it attainable for all?**	**Ch. 16 in Rhoton and Shane.**	• Online work • Assignment 3 – First Posting to Your Electronic Portfolio Site due by Friday of this week
Session 3 Feb 9	•**Professional Portfolio** – The nature of evidence in a portfolio	• **Readings about portfolios**	• Online work

Session 4 Feb 16	• **Issue 3 – Ability Grouping – what is the evidence?** • **Issue 4: Impact of Technology on Science Teaching**	• **Ch. 1 in Rhoton and Shane**	• Online work • Assignment 3 – Second Posting to Your Electronic Portfolio Site due by Friday of this week • Assignment 2: Submit first draft of article online for review.

Session 5 Feb 23	• **Issue 5: Topic skipped.** • **Issue 6: Importance of Partnerships in Science Reform**	• **Ch. 14 in Rhone and Shane**	• Online work • Assignment 1 - First POSITION Paper Due by March 3rd (chosen from issues 1-6) • Assignment 5: Team One posts issue and discussion • Assignment 2: Article draft, due March 3rd, 11:59 p.m.
Session 6 March 2	• **Issue 7: Science in the inclusion classroom** • **Issue 8: Importance of Vertical Articulation**	• **Ch. 5 in Rhone and Shane** • **Ch. 12 in Yager**	• Online work • Assignment 3 – Third Posting to Your Electronic Portfolio Site due Friday • Assignment 5: Team Two posts issue and discussion
Session 7 March 9	• **Issue 9: Are there still gender differences in science?** • **Issue 10: Creating a Community of Excellence**	**Assigned readings** • **Chapter 9 in Yager**	• Online work • Assignment 1 - Second POSITION Paper Due (chosen from issues 1 - 10) • Assignment 3 – Fourth Posting to Your Electronic Portfolio Site due Friday • Assignment 5: Team Three posts issue and discussion

Session 8 March 23	• **Analyzing Teaching** Examining a video case: Send video of your own teaching • **Issue 11: Learning in Science**	• **Ch. 19 in Rhoton and Shane**	• Assignment 1 - Third POSITION Paper Due March 30th (chosen from issues 1-11) • Assignment 5: Team Four and Five post issue and discussion • Assignment 2: Final Draft Due today
Session 9 March 30	• **Issue 12: Interdisciplinary Science** • **Issue 13: Best practices in Professional Development**	• **CHANGE: Choose from various readings from NSTA** • **Ch. 9 in Rhoton and Shane**	• Assignment 3 – Fifth Posting to Your Electronic Portfolio Site – Self-reflection: April 7th • Assignment 4: Submit to journal • Assignment 5: Team Six posts issue and discussion
Session 10 April 6	• **Course Wrap Up** • **Directions for the future**		• Assignment 3 – Final Posting to Your Electronic Portfolio Site • Assignment 1 – Fourth POSITION Paper Due (chosen from issues 1-13), April 13th