Syllabus for TE 802, Science Section
(Sections 19 and 20, Fall Semester, 2002)

General Information

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Course website
All readings and assignments for the course are available on the course website:

Team 4 website
All handbooks, schedules, and other information is available on the Team 4 website:
http://ed-web2.educ.msu.edu/team4/

Required Readings
New for this semester:
Readings available on course website:
• Learning to Teach Science for Understanding (revised), by Charles W. Anderson
group discourse and scientific knowledge-building. Journal of Research in Science Teaching,
33(8), 821-38

Continued from last semester:
Subscription to a science or science-education related journal
National Science Teachers Association: http://www.nsta.org/

Books
Secondary Classroom Management: Lessons from Research and Practice, by Carol Simon Weinstein
Software
Microsoft Office (Required). This should be the basic version and for Macintosh users, should be 2001.
For DOS users, it should be at least 98.
Readings Available On-Line:
Science for All Americans, by James Rutherford and Andrew Ahlgren.
http://project2061.aas.org/tools/sfaaol/sfaatoc.htm
Benchmarks for Science Literacy, by AAAS: http://project2061.aas.org/tools/benchol/bolframe.html
National Science Education Standards : http://www.nap.edu/readingroom/books/nses/html
Course Overview

This course is a continuation of TE 402. We can think of this course as organized around five continuing themes, each of which began during TE 401 and will continue through your internship and beyond. The four themes and the work associated with each are briefly described below.

Theme 1: Planning and teaching lessons in context
You will have increasing responsibilities for teaching during this semester. You will have substantial responsibilities for teaching one class—your focus class—throughout the semester. During your guided lead teaching periods in October and November you will take on added responsibilities in additional classes. To move in this direction, it is important that this semester you work on the connections between the lessons and the context of your teaching. In particular, we will focus on two kinds of connections:

- Connecting teaching activities with purposes, assessments, and revisions through the teaching cycle. You will continue to work on the entire teaching cycle (clarifying your goals for student learning, planning and teaching lesson activities, assessment and revision) for each lesson. This process should become easier as you gain experience and as we build resources on the course website.
- Connecting lessons through the learning cycle and storylines. You will also be working to make sure that each lesson you teach is connected to other lessons that you and your mentor teaches. You will do this partly by thinking about how you can use learning cycles to connect each lesson with other lessons that share common objectives. You will also be learning to construct storylines that connect your lesson to other lessons with common themes or topics.

Theme 2: Working with diverse students
A second theme will involve understanding your students and how they make sense of the world—and of the work that you ask them to do in science class. Much of this work and conversation will revolve around the students in your field placement classes. You will continue to pay special attention to your three focus students in your assessments, and to work to understand how your teaching looked from the focus students’ perspectives as well as your own perspective. We hope that by the end of the term you will feel that you understand these students well and that you can use this understanding to improve your teaching.

Theme 3: Developing resources to support your own teaching and others’ teaching
You will also work with your mentors and colleagues to develop resources that will support your teaching and that you will share in class and through the course website. In particular, you will work in a group of about three of your colleagues to become experts on one topic in the curriculum and develop resources that everyone in the class can use. As you do this, you will consult with your colleagues, your mentor, and other mentors to learn about common student difficulties and effective teaching strategies. You will also find and learn from print and web-based resources.

Theme 4: Inquiry in science, for your students, and about your own teaching
Much of our discussion of science teaching will be organized around the themes of inquiry and application—two essential practices of scientific communities. We will discuss how scientists conduct inquiry and ways that you can involve students in your class in inquiry. In addition, you will be conducting inquiry into your own teaching through teaching investigations.

Theme 5: Working on emergent issues
We know that the four themes above are essential to your becoming a good science teacher, but there’s a lot more, too. We will therefore ask you to contribute to a “hit list” in which you identify the problems or concerns that are most important to you and we will work on those problems throughout the semester.
Course Objectives

<table>
<thead>
<tr>
<th>Objective</th>
<th>Type</th>
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<tbody>
<tr>
<td>1. Explain the advantages and disadvantages of different approaches to teaching (traditional didactic and discovery teaching, project-based learning, standards-based teaching).</td>
<td>Reflecting</td>
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<tr>
<td>2. Use the course website as a resource for planning, teaching, and assessment.</td>
<td>Constructing</td>
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<tr>
<td>3. Share ideas about planning, teaching, and assessment with colleagues and use their ideas.</td>
<td>Constructing</td>
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<tr>
<td>4. Develop objectives for meaningful and important student learning that are consistent with state and national standards and clarify their meaning (big ideas, real-world examples, objectives for student learning).</td>
<td>Using</td>
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<tr>
<td>5. Use the learning cycle to plan sequences of activities leading to meaningful student learning (establishing the problem, modeling, coaching, fading, maintenance).</td>
<td>Using</td>
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<td>7. Plan and use strategies for creating and managing classroom learning communities (understanding students socially; classroom social norms, rules, and routines; managing dilemmas and tradeoffs).</td>
<td>Using</td>
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<td>8. Assess how students understand or make sense of a topic (developing assessment tasks, making sense of students’ responses, developing and using rubrics).</td>
<td>Using</td>
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<td>9. Learn from teaching experience and assessment results to improve your teaching practices (designing and carrying out teaching experiments, revising lessons based on experience and assessment results).</td>
<td>Constructing</td>
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<tr>
<td>10. Find, evaluate, and use resources to support teaching for understanding.</td>
<td>Constructing</td>
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Tentative Course Schedule

This course has three parts. During September, we will concentrate on the beginning of the school year and on helping you prepare for your first guided lead teaching. During the two guided lead teaching periods and the three weeks between them, we will concentrate on your planning, teaching, assessment, and reflection during your guided lead teaching periods. After the conclusion of your second guided lead teaching in November, we will take a step back to assess where you are, and you will have some time to focus on longer-term goals. Here is a more detailed look at this progression.

<table>
<thead>
<tr>
<th>Date</th>
<th>Discussion topics</th>
<th>Readings or Assignments due</th>
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<tbody>
<tr>
<td>8/30</td>
<td>Meet in 105 Bessey Hall</td>
<td>Update your personal information on web database</td>
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<td></td>
<td>Opening of school</td>
<td>Read Learning to Teach for Understanding (revised)</td>
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<td></td>
<td>Forming subject matter and topic groups</td>
<td>Beginning of school assignment (bring printed copy to class)</td>
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<td></td>
<td>Review of key ideas (learning cycle)</td>
<td><strong>Part 1: Review and preparation for first guided lead teaching</strong></td>
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<td>9/6</td>
<td>Unit planning review</td>
<td>Tentative topic for first lead teaching</td>
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<td></td>
<td>Designing teaching investigations</td>
<td>Read Weinstein Chapter 5</td>
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<tr>
<td>9/13</td>
<td>Managing laboratories and lab safety</td>
<td>Teaching experiment report</td>
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<tr>
<td></td>
<td>Discussion of teaching investigations</td>
<td><strong>Part 1: Review and preparation for first guided lead teaching</strong></td>
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<tr>
<td>9/20</td>
<td>Field instructors visit class</td>
<td>Unit plan for first guided lead teaching</td>
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<td></td>
<td>Meetings with field instructors: Professional goals and preparation for lead teaching</td>
<td><strong>Part 1: Review and preparation for first guided lead teaching</strong></td>
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<tr>
<td></td>
<td>Unit planning workshop? Start group topic teaching?</td>
<td><strong>Part 1: Review and preparation for first guided lead teaching</strong></td>
</tr>
<tr>
<td>9/27</td>
<td>Group teaching about topic</td>
<td>Topics word file for your topic (one for each group)</td>
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Assignments and Grading

Your work in TE 802 will include assignments that are graded by us and assignments that are shared with your field instructor. You should share all assignments with your mentor teacher.

Assignments graded by TE 802 instructors

Please submit the assignments below electronically to the course website. Your assignments should also be shared with your mentor teacher and field instructor. Assignments are due by midnight on the dates that they are assigned. These are real deadlines. We will deduct 0.5 from your final grade (e.g., 3.5 to 3.0) if you miss them. We will send you electronic feedback on your assignments before the next class.

1. **Beginning of year assignment.** (10 % of course grade, due August 30). Before the first 802 class meeting, work with your mentor teacher to develop a brief report on some important aspects of your mentor teacher's room and your focus class. A template for this assignment is on the course website. Contents
   - Teaching Schedule. A weekly schedule of the courses you/your mentors teach and the hours these classes are taught.
   - Focus Class Topics. A tentative list of chapters or topics that you will be teaching in your focus class during the first semester.
   - Topic Development Ideas. Ideas about (a) common student difficulties, (b) assessment, and (c) teaching activities and materials, based on discussions with your mentor teacher.

2. **First teaching investigation.** (5% of course grade, due September 13). After reading the Chapter 5 on getting students' cooperation in Secondary Classroom Management, pick one strategy for getting students' cooperation and try it in your focus class. (This will probably require some advance planning with your mentor.) When you teach this lesson you will collect 4 kinds of data:
   - your notes on your lesson plan made immediately after teaching;
   - observation notes from your mentor and/or field instructor;
   - a discussion with your mentor about what they saw and how your strategy worked.

Based on your analysis of these data, you will adjust or refine your strategies. Write approximately two pages on this experience. Include how the strategy was described in the reading, your plan for
adapting the idea to your focus class, what actually happened, and your assessment of the strategy after the experience.

4. **Topic word file and report** (10 % of course grade, group project due September 27). You will work in a group of about three of your colleagues to become experts on one topic in the curriculum and develop resources that everyone in the class can use. With help from your colleagues and their mentors, you will develop a revised file for the topic that includes the following:
   - Michigan Benchmarks, AAAS Benchmarks, and NSES Standards (already in file)
   - Common student difficulties with this topic, based on experience and research
   - Assessment ideas and resources
   - A well-developed learning cycle for one key objective, including teaching materials and lesson plans
   - Other teaching ideas and resources

Your group will have 15 minutes to teach the rest of the class about this topic and introduce them to the resources you have developed on September 27.

5. **Unit plans, teaching investigations, and reports** (40% of course grade). Your planning and teaching in your focus class, particularly during the two guided lead teaching periods, will play a central role in this class. You will also plan and carry out a teaching experiment during each lead teaching period. Teaching investigations explore problems or issues that concern you in your teaching. These investigations should involve planned data collection and analysis (though not necessarily experimental and control groups). You will use the template on the course website to do each unit plan and report in two parts. These parts are summarized below:

*Unit and teaching investigation plan.* Before each lead teaching period you will submit a plan to the course website including the following:
   - Abstract
   - Clarifying your goals: Big ideas, objectives, and real-world examples
   - Developed plans for one key objective: Ideal learning cycle, pre-and post-assessment
   - Plans for your teaching experiment: Question, rationale, and plans for data collection
   - Supporting materials such as drafts of handout

*Unit and teaching investigation report.* After each lead teaching period you will submit a report to the course website including the following:
   - Your unit plan, revised as necessary
   - An assessment of how your three focus students understood your key objective
   - Results and conclusions of your teaching experiment
   - Supplemental materials, including materials that you developed or used and examples of student work.

Unit plans are due at least one week before the beginning of each lead teaching period: September 20 and October 25. We will comment on these plans, but we will not grade them.

Unit reports are due two weeks after the conclusion of each lead teaching period: November 1 and December 6.

6. **Inquiry teaching plan** (10% of course grade, due December 13). You will take an objective that you taught during the semester and develop a revised teaching plan for that objective. The teaching plan (one or more lessons) should engage the students in understanding patterns and/or theories through inquiry. That is, they will be finding and explaining patterns in data.

Assignments graded by your field instructor
Two parts of your grade that are directly connected with your daily work in your class will be determined by your field instructor. These are described below.

1. **Focus class binders, including daily lesson plans** (10% of course grade). You are required to have written lesson plans in your focus class binder in time for your field instructor and mentor teacher to review them—and for you to revise them—before you actually teach. You, your mentor, and your field instructor should work out what schedule this will be. Lesson plans for completed lessons should be left in your focus class binder, along with other materials listed on the first page of the binder.

2. **Field journal** (10% of course grade). Your field journals consist of at least weekly reflections that you record about your experiences at your placement school or related experiences you have this year. This will be helpful for your thinking about a host of issues you will confront during your internship and will help to guide your planning and instruction. It also will help your field instructor (FI) get a "feel" for the issues you are struggling with and the kind of progress you are making toward your goals as a teacher. In short, since they cannot be with you each day, it will help them help you better. These journals will be E-mailed to your FI every week, and (s)he will respond to you with comments/questions. When you E-mail your field instructor, you should also send a copy to the 802 instructor (Barb, Judy, or Andy) who leads your small group.

3. **Video of your teaching** (5% of course grade). You should bring to the first class after your first lead teaching a video that includes 5 minutes or less of your teaching. Select a segment (or segments) that are relevant to the professional goals you set for your first lead teaching. Be prepared to share and discuss this video with your field instructor and your peers in your field instructor group. If there are handouts or copies of overhead transparencies necessary to understand the video, bring about 6 copies.

**Attendance at course meetings and field placements**

Our program’s attendance policy is explained on page 28 of the Intern Handbook. In brief, we expect you to be professional with respect to attendance and punctuality both in your school and in this seminar. In school, that means that you should NEVER be absent without informing your mentor teacher in advance, and that only illness or the most important personal business is an adequate reason to miss school.

You also should NEVER miss this seminar without informing us in advance, and you should know that we will rarely, if ever, grant an excused absence for activities at your school other than parent conferences. We know that sometimes the seminars cause you to miss important and educationally valuable activities at your school. However, this seminar is also an important and educationally valuable part of your internship, and it can be an effective learning experience for you only if you attend consistently.