Q620 University Science Teaching
Class Meetings: Tuesdays 2:30-5:15 PM; EDUCATION Room 3105

CONTACT INFORMATION:
Adam Maltese Rm 3054
Ph: 856-8059 Email: amaltese@indiana.edu
Office Hours: By appointment

BACKGROUND: Information on my teaching and research interests can be found here: education.indiana.edu/amaltese; more detailed background information can be found here: mypage.iu.edu/~amaltese/

COURSE OBJECTIVES: This class is designed to provide a survey of the background knowledge and skills involved with teaching science to adult learners in various contexts. Therefore, the three main goals of this course are to:
   a) Increase your experience level in instructing and evaluating science teaching
   b) Introduce you to theoretical and practical issues related to the learning and teaching of science
   c) Help you develop the habits of a thoughtful practitioner

Thus, as a part of this course, you will be asked to:
1) Prepare and teach science lessons based on concepts and practices discussed in class
2) Take an active role in discussing the benefits, drawbacks and realities of various teaching methods
3) Evaluate the teaching of peers and faculty based on your evolving understanding of “best practices”
4) Prepare artifacts that can be included in your teaching portfolio for use in job search

PROFESSIONALISM: One of the main objectives of this course is to develop your skills as educators. You will spend a good portion of class time teaching your classmates as well as evaluating lessons. In this class it is allowable to be critical, but it is a requirement to be courteous and helpful. Simply pointing out problems is shirking your duties - develop the habit of suggesting thoughtful ways for improvement. In this class, anything short of civility and respect for your classmates will not be tolerated.

Attendance is required; persistent tardiness or absence will result in the loss of points from your grade.

Cell phones are not to be used during the class for calls, games, text messages, etc. Students violating this rule will be dismissed from class.

ACCOMMODATION: If any student will require assistance or appropriate academic accommodations for a disability, please contact me after class, during my office hours, or by individual appointment. You must have established your eligibility for disability support services through the Office of Disability Services for Students in 006 Franklin Hall, 855-7578.
RECOMMENDED BOOKS:


ACADEMIC DISHONESTY/ORIGINALITY OF WORK: As part of this course you will complete writing assignments and preparation of class lessons. While I strongly encourage you to be creative and think of new ways to teach based on your interests and styles, there are innumerable resources available via the web and elsewhere. These resources may be used to aid you in the development of your lessons, but the majority of work in putting together your lessons must be your work. Additionally, make sure to reference any resources you used in developing your plans. If, upon checking your work it seems as though your assignment is not your own, you will lose credit for the assignment and may face more serious charges of plagiarism.

ASSIGNMENTS: When submitting assignments on Oncourse, please label each document with an appropriate title and your last name (e.g., Wk1_Syllabus_Name). *If you are ever unclear about what is expected of you for an assignment, please contact me.*

Major Assignments:  
- Technology tidbit (sim., podcast, etc.)  
- Teaching Philosophy Statement  
- Final Teaching Demo  
- Course syllabus/Exam (final)

Minor Assignments:  
- Lesson Plans  
- Conceptual Change Investigation  
- Evaluations  
- Wiki Entries

GRADING: The grading system used in this class is based on a criterion-referenced system where your work is compared to a set of standards and points are earned for satisfactory achievement of task goals. The expectations for each assignment will be elaborated on Oncourse when announced. *Any assignments turned in late will lose 20% from the total number of earned points per day late up to a maximum of 80%. Anything submitted more than two weeks past the initial due date will receive no credit.* If you are ever unclear about why you received a particular grade, please contact me. The following is the overall grading scheme:

**Major Assignments:** ~50 pts each  
**Minor Assignments:** 10-20 pts each  
**Class Participation** (completing readings, participating in discussions, attendance) = 25-50 pts

**Grade = Points Earned / Total Potential Points**

Final Grade:  
- A = 90-100  
- B = 80-89  
- C = 70-79  
- D = 60-69  
- F < 60
# SCHEDULE

(This schedule is dynamic and is likely to change. Students will be notified of any significant changes.)

<table>
<thead>
<tr>
<th>Theme</th>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Reading for Class</th>
<th>Assignment due</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course Management</strong></td>
<td>1</td>
<td>8/27</td>
<td>Syllabus, etc. / What makes a &quot;good&quot; course?</td>
<td>None</td>
<td>Prep 5 minute lesson on your favorite thing</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>9/3</td>
<td>Theories of Learning</td>
<td>How people learn (Chap 2, 3 &amp; 5); Rohrer &amp; Pashler (2010)</td>
<td>General course outline for your future intro class</td>
</tr>
<tr>
<td><strong>Knowing Your Students</strong></td>
<td>3</td>
<td>9/10</td>
<td>Theories of Teaching</td>
<td>Wilson et al. (2010) + Article in field</td>
<td>Coding of iTunesU video podcast of teaching from your field / Teaching Demo #1 plan</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>9/17</td>
<td>Teaching Demo #1 / Conceptual Change</td>
<td>Posner (1982); Driver (1994) + Article in field</td>
<td>Observe/evaluate 50 minute science lecture</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>9/24</td>
<td>Conceptual Change / Assessment</td>
<td>Tomlinson (p. 59-82); Tice (p. 65-75) + Article in field</td>
<td>Conceptual Change Investigation</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>10/1</td>
<td>Grades / Introduce Tech Project</td>
<td>Pattison (2013); Rojstaczer (2010); Zhang (2009)</td>
<td>Teaching Demo #2 plan</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>10/8</td>
<td>Teaching Demo #2</td>
<td>Bain - Chapter 5</td>
<td>Initial plan for Tech Project (group or indiv.)</td>
</tr>
<tr>
<td><strong>Engaging Your Students</strong></td>
<td>8</td>
<td>10/15</td>
<td>Lectures &amp; Active Teaching</td>
<td>Crouch &amp; Mazur (1999); Nilson (p. 93-104)</td>
<td>Find an example of active teaching / Reflect on assessments from Wk 6</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>10/29</td>
<td>Labs/Activities</td>
<td>Tice (p. 150-161); NSTA Chapters 4 &amp; 10</td>
<td>Prepare Lab Activity for classmates to complete</td>
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<tr>
<td></td>
<td>11</td>
<td>11/5</td>
<td>Technology (Review/Explain)</td>
<td>TBD</td>
<td>Technology 'project' due</td>
</tr>
<tr>
<td><strong>The Job Search</strong></td>
<td>12</td>
<td>11/12</td>
<td>Faculty Expert Panel / Teaching Philosophy Statements</td>
<td>Coppola (2002)</td>
<td>Teaching Philosophy Draft 1</td>
</tr>
<tr>
<td><strong>Engaging Your Students</strong></td>
<td>13</td>
<td>11/19</td>
<td>Case Studies</td>
<td>TBD</td>
<td>Observe/Evaluate two 50 minute lectures</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>11/26</td>
<td></td>
<td>No Class - Thanksgiving Break</td>
<td></td>
</tr>
<tr>
<td><strong>Bringing it all together</strong></td>
<td>15</td>
<td>12/3</td>
<td>Final Teaching Demo</td>
<td></td>
<td>Teaching Demo Plan + Summary</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>12/10</td>
<td>Final Teaching Demo</td>
<td></td>
<td>Teaching Demo Plan + Summary</td>
</tr>
<tr>
<td><strong>FINALS</strong></td>
<td>17</td>
<td>12/17</td>
<td></td>
<td>Final Project / Teaching Philosophy Statement</td>
<td></td>
</tr>
</tbody>
</table>

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**Course Management**

1. **Syllabus, etc. / What makes a "good" course?**
   - None

2. **Theories of Learning**
   - How people learn (Chap 2, 3 & 5); Rohrer & Pashler (2010)

3. **Teaching Demo #1 / Conceptual Change**
   - Posner (1982); Driver (1994) + Article in field

4. **Conceptual Change / Assessment**
   - Tomlinson (p. 59-82); Tice (p. 65-75) + Article in field

5. **Grades / Introduce Tech Project**
   - Pattison (2013); Rojstaczer (2010); Zhang (2009)

6. **Teaching Demo #2**
   - Bain - Chapter 5

7. **Lectures & Active Teaching**
   - Crouch & Mazur (1999); Nilson (p. 93-104)

8. **Group Work**
   - Springer (1999) + Article in field

9. **Labs/Activities**
   - Tice (p. 150-161); NSTA Chapters 4 & 10

10. **Technology (Review/Explain)**
    - TBD

11. **Faculty Expert Panel / Teaching Philosophy Statements**
    - Coppola (2002)

12. **Case Studies**
    - TBD

13. **Final Teaching Demo**
    - Teaching Demo Plan + Summary

14. **No Class - Thanksgiving Break**

15. **Final Teaching Demo**
    - Teaching Demo Plan + Summary

16. **Final Project / Teaching Philosophy Statement**

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**Knowing Your Students**

1. **Teaching Demo #1 / Conceptual Change**
   - Posner (1982); Driver (1994) + Article in field

2. **General course outline for your future intro class**

3. **Coding of iTunesU video podcast of teaching from your field / Teaching Demo #1 plan**

4. **Conceptual Change Investigation**

5. **Initial plan for Tech Project (group or indiv.)**

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**Engaging Your Students**

1. **Technology 'project' due**

2. **Self-evaluation of TD #2 video**

3. **Prepare Lab Activity for classmates to complete**

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**The Job Search**

4. **Teaching Philosophy Draft 1**

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**Engaging Your Students**

5. **Observe/Evaluate two 50 minute lectures**

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**Bringing it all together**

6. **Teaching Demo Plan + Summary**

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**FINALS**

7. **Final Project / Teaching Philosophy Statement**

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**Course Management**

1. **Prep 5 minute lesson on your favorite thing**

2. **General course outline for your future intro class**

3. **Coding of iTunesU video podcast of teaching from your field / Teaching Demo #1 plan**

4. **Conceptual Change Investigation**

5. **Initial plan for Tech Project (group or indiv.)**

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**Engaging Your Students**

6. **Find an example of active teaching / Reflect on assessments from Wk 6**

7. **Self-evaluation of TD #2 video**

8. **Prepare Lab Activity for classmates to complete**

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**The Job Search**

9. **Teaching Philosophy Draft 1**

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**Engaging Your Students**

10. **Observe/Evaluate two 50 minute lectures**

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**Bringing it all together**

11. **Teaching Demo Plan + Summary**

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**FINALS**

12. **Final Project / Teaching Philosophy Statement**