BI 698: Teaching Practices for Anatomy and Physiology
1 graduate semester credit
Fall 2021

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Course Location:
- Online Zoom meetings (nine weeks)
- There is no required face-to-face component for this course.

Required Texts:
   School, Washington, D.C.: National Academy Press (you may download a free PDF of
   the entire book at: http://www.nap.edu/openbook.php?isbn=0309070368 )
2. Joel J. Mintzes and Emily Walters (Eds.). (2020) Active Learning in College Science: The
   Case for Evidence-Based Practice. Springer.

Computer Requirements:
- For synchronous online discussions using Zoom, participants should have access to a
  computer with both a camera and a microphone (so the individual can project video and
  be heard in discussions).
- Participants should have a relatively fast internet connection (dial-up connections may be
  problematic) for online discussions and to access any additional online videos the
  instructor assigns.
- Participants will need a gmail account in order to facilitate collaborative work using
  Google docs and Google sheets.

Course Format: This is an online course, with no in-person component. We will use google
drive to access assigned readings and communicate with classmates. Weekly online
synchronous video discussions will be held on Zoom. Final assignments will be peer reviewed,
and both the peer review process and the submission of the final assignments will be done online
via the google drive.
Course Description: This course is for college level instructors who are interested in learning various pedagogical techniques that are beneficial to the teaching of Human Anatomy and Physiology, including to diverse student populations. Students will review the science supporting various instructional methods and learn how to implement Evidence-Based Instructional Methods (EBIPs) such as clickers (audience response systems), guided inquiry, cooperative group work, cooperative quizzes/group learning, and think-pair-share. The basics of conceptional learning will be explored. Assessment techniques to measure learning will focus on the importance of validity and reliability of testing (cognitive testing) and the use of concept inventories to collect learning data.

Course Expectations: This is a graduate-level course, and participants should expect to be able to devote a significant amount of time in course work, which will include:

- Directed readings in pedagogy and Evidence-Based Instructional Methods (~15 hours)
- Participation in weekly online discussion forums (through Zoom) to discuss the readings, and final project (~10 to 15 hours)
- Searching online databases for background literature about a specific anatomy and physiology Evidence-Based Instructional Method you’re interested in (~at least 5-10 hours)
- Development and write-up of a 3 page review of an Evidence-Based Instructional Method you want to use in your classroom (~5 hours)
- Peer evaluation of at least one other review paper of another HAPS-I participant (~2 hours)
- Incorporation of peer evaluation feedback into your final review paper (~2-3 hours)

Course Outcomes: Upon completion of this course, participants should be able to:

1. Describe theories of learning and instruction from the perspective of cognitive research, and theories of motivation and personality.
2. Communicate the supported benefits of active learning techniques for science education.
3. Compare and contrast teacher-centered and student-centered methods of instruction.
4. Articulate strategies for addressing the needs of culturally diverse and special needs students.
5. Develop an implementation plan for Evidence-Based Instructional Practices (EBIPs) that accommodates the instructor’s specific institutional framework.
7. Articulate the benefits and uses of a concept inventory as an assessment tool.

Course Assessments and Grading Policy:

In order to pass this course, participants must earn 70% of the 200 total points assessed. Participants will be assessed in a variety of ways:

1. Participation in the synchronous discussion forums on Zoom (50 points total): During 9 of the weeks of online instruction, participants will be expected to participate in weekly online discussion forums through Zoom. Participants will be expected discuss the online readings, ask questions related to the readings and EBIPs, and assist in answering student questions. Should a participant not be able to attend an online discussion session, an individual may make up online
discussion points by submitting a 1 page summary of the week’s online readings and list
questions and ideas raised by the readings.

2. **One page assignments / leading online discussion (20 points).** Each member of the class
will be required to generate a 1 page assignment for various discussion points or reading
assignments provided by the instructors. They will also be required to generate discussion
questions and lead the Zoom session when that topic is scheduled.

   A. You teach the way you’ve been taught. How were you taught as an
      undergraduate? *Everyone must turn this one in*
   B. Write two paragraphs describing "a good day in your classroom" and one
      paragraph describing a "bad day in your classroom."
   C. In your own words, what is social constructivism?
   D. What is conceptual learning? How is it different from memorization?
   E. Identity 3 different active learning strategies that you might use in your final
      project. Describe what these activities look and sound like when successfully
      used in an A & P classroom.

3. **Evidence-Based Instructional Practice Review (20 points).** Each participant will focus on
a specific evidence based instructional practice (EBIP), such as guided inquiry, cooperative
quizzes, or peer instruction (student response systems). Each participant will conduct a thorough
research review for the chosen EBIP and prepare at least four one-half page reviews of research
articles. (Note: this assignment will complement the final project.)
Identity one active learning strategy and:
   -- describe its structure and function (anatomy and physiology of this teaching technique)
   -- identity at least 4 research articles describing its effectiveness - summarize those articles.
   -- describe your experience with this strategy. Have you used it before? Have you seen it
      succeed? Fail?

4. **Final project draft (Review paper) (50 points):** Each participant will design and prepare a 3
page review paper that: 1. Defines the EBIP clearly; 2. Provides a review of how this EBIP has
been used for instruction; and 3. Provides a general plan for how it could be applied in the
classroom. Submissions will be peer-reviewed by classmates.

5. **Peer review of a final project (20 points):** Participants are required to write up a 1–2-page
peer review of a classmate’s review paper. The peer review should focus on constructive
criticism, as described in the workshop session and related to the classroom readings. The peer
reviewer should address questions such as: 1. Is the EBIP well defined and explained? 2. Does
the paper have sufficient coverage of the background literature? And 3. Is there a general plan
for implementation in their classroom? Peer reviews will be posted online and emailed to the
instructors.

6. **Revised final project (Research Proposal (40 points):** Participants will revise their project
draft based on the peer review and submit a final version via email. In addition, participants will
submit a document summarizing their response to the peer review, outlining which comments
were incorporated and explaining why others were not incorporated. The peer review response
will be submitted along with the revised final project. Failure to turn in a timely peer review or
failure to incorporate appropriate peer review comments will result in a partial or complete loss of these points.

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<thead>
<tr>
<th>1. Discussion Forum Participation</th>
<th>50 points</th>
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<tbody>
<tr>
<td>2. Book chapter/journal article summary/1 page assignments (1 page) / leading an online discussion / discussion questions</td>
<td>20 points</td>
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<tr>
<td>3. Research review for final project (Four ½ page reviews of research articles)</td>
<td>20 points</td>
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<tr>
<td>4. Final Project (3-page review paper)</td>
<td>50 points</td>
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<td>5. Peer review of final project (1 to 2-page critique)</td>
<td>20 points</td>
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<td>6. Revised final project (3 page review paper)</td>
<td>40 points</td>
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<td><strong>TOTAL</strong></td>
<td><strong>200 points</strong></td>
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**Course Schedule:**

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<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading or Class Assignment</th>
<th>One page write up/Discussion topic</th>
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<tbody>
<tr>
<td>Week 1: Sept 14</td>
<td>Introduction to Course, Metacognition, Why discuss pedagogy?</td>
<td>How People Learn, Ch 1 Optimizing Teaching, Ch 1</td>
<td>How were you taught as an undergraduate?</td>
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<tr>
<td>Week 3: Sept 28</td>
<td>Assessment techniques</td>
<td>Classroom Assessment/Activities (U of M) <a href="https://docs.google.com/document/d/1QMZC9igdPe8gg1SC-NbOuAB05WnG3ujAtJlzNEHssx4/edit">https://docs.google.com/document/d/1QMZC9igdPe8gg1SC-NbOuAB05WnG3ujAtJlzNEHssx4/edit</a></td>
<td>Conceptual learning</td>
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<td>Week 4: Oct 4</td>
<td>EBIPs overview</td>
<td>Active Learning in College Science (Evidence-Based Practices for the Active Learning Classroom)- Chapter 2</td>
<td>Active learning strategies</td>
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<tr>
<td>Week 6: Oct 18</td>
<td>Select EBIP/Research reviews</td>
<td>Review research articles</td>
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<tr>
<td>Week 7: Oct 25</td>
<td>Discussion of Final Review Papers</td>
<td><strong>Final Project (3 page review paper)</strong></td>
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<tr>
<td>Week 8: Nov 2</td>
<td>Peer Review of Final Review Papers</td>
<td>Critiques / peer review of final projects</td>
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<tr>
<td>Week 9: Nov 9</td>
<td>Modify, edit and finalize Final Review Papers</td>
<td>Final, revised, review papers due at a time TBD.</td>
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Recommended Resources: Note: Participants do not need to read all of these resources. Additional resources may be posted on the google drive.

Peer Reviewed Papers


**Books**

*Scientific Teaching,* by Jo Handelsman, Sarah Miller, and Christine Pfund.


**Videos**

*Biology Education Scholarship* – by Erin Dolan