

## L&S Interdisciplinary Courses 701 Topics: Graduate Students Interested in Teaching

**Session LBB, August 11–24, #64442**

**MWF, 8:30–2:30**

**6112 Social Sciences**

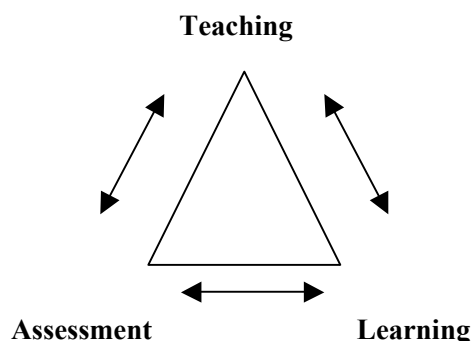
### **Instructors**

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### **Course Framework**

Designed especially for graduate students in science, technology, engineering, and mathematics (STEM) disciplines, this course explores learning, teaching, and assessment through the lens of “teaching-as-research.” The course is designed to promote the development of those skills and habits-of-mind, along with the knowledge base, associated with high-quality learning, teaching, and assessment. We define teaching-as-research as “a deliberate, systematic, and reflective use of research methods to develop and implement teaching practices that advance the learning experiences and learning outcomes of students as well as teachers.”



Consonant with this definition, class participants will be invited to view their classrooms as sites for ongoing research in which they are continually engaged in reflecting on their own teaching practices in order to maximize their students’ learning. Through engaging in Teaching-as-Research as an interconnected cycle of teaching and learning, they will learn to use ongoing formative assessment to continually gauge their students’ learning and adjust their teaching accordingly. More specifically, participants will be engaged in Teaching-as-Research by applying the various methods and strategies through engaging in micro-teaching sessions as well in constructing their own teaching philosophy.

**Course Goals**

After completing this course, graduate students as well as participating faculty are expected to be more reflective practitioners who, in particular, have a full appreciation of the interconnected cycle of learning, assessment, and teaching--and will be able to use ongoing formative assessment to continually gauge their students' learning and adjust their teaching accordingly. Hand-in-hand with learning about Teaching-as-Research and viewing their classrooms as sites for ongoing research into their own teaching, they will consistently seek to improve their teaching in ways that meaningfully enhance student learning.

**Special Needs**

We wish to fully include persons with disabilities in this course. If any participant has special circumstances that he or she believes may affect his or her performance in this class, please meet with one of the instructors make necessary accommodations that will enable you to fully participate. We will maintain complete confidentiality of any information provided.

**Required Course Readings**

Palmer, P. (1998). *The courage to teach: Exploring the inner landscape of a teacher's life*. (1st ed.). San Francisco, CA: Jossey-Bass.

McKeachie, W. J. (2002). *McKeachie's teaching tips: Strategies, research, and theory for college and university teachers* (11<sup>th</sup> edition). Boston, MA: Houghton Mifflin Co.

**Recommended Texts**

Bransford, J., Brown, A. L., Cocking, R. R., National Research Council, Committee on Developments in the Science of Learning, Committee on Learning Research and Educational Practice, et al. (Eds.). (2000). *How people learn: Brain, mind, experience, and school* (Expanded ed.). Washington, DC: National Academy Press.

Hutchings, P. (Ed.). (1998). *The course portfolio: How faculty can examine their teaching to advance practice and improve student learning*. Washington DC: American Association for Higher Education.

Cross, K. P., & Steadman, M. H. (1996). *Classroom research: Implementing the scholarship of teaching*. San Francisco, CA: Jossey-Bass.

Reis, R. M., & IEEE Education Society. (1997). *Tomorrow's professor: Preparing for academic careers in science and engineering*. New York, NY: IEEE Press.

## Course Outline

- I. Assessment
  - A. Introduction to Assessment
  - B. Traditional Assessments
  - C. Alternative Assessments (Journals, Collaborative Testing, Student Writing, Portfolios, Observations, Open-Ended Problems, Self-Assessment)
  - D. Issues Surrounding Assessment (Cheating and Plagiarism, Grading)
  
- II. Teaching and Learning, Teachers and Learners
  - A. A Paradigm Shift from Instructor-Centered to Teaching- and Learning-Centered
  - B. Perspectives on Teaching and Teachers
    1. Teaching: Didactic, Facilitative, and Collaborative
    2. Teachers: (Re)visioning Teachers
  - C. Perspectives on Learning and Learners
    1. Learning: Understanding
    2. Learners: Diversity and Learning Style Issues

## Course Requirements

### 1. Course Readings: Questions and Responses

Discussion of the readings will be an integral component of class sessions. Class participants will be expected to read and reflect on the ideas and research presented in the readings prior to attending class and, in turn, prepared to discuss the readings through offering insights and critiques as well as raising questions. In addition, you will identify and share a related resource applicable to the topic from your discipline.

Each class period, each class participant will be required to post one question about that session's reading to the class website. We will be able to see everyone's questions and, in turn, we encourage you to think about how you might answer their questions as well as your own. Twice throughout the class you will need to answer either a question you posed or one posed by someone else. These responses, each of which should be roughly two or three double-spaced pages, are intended to help you advance your inquiry beyond the level reached in classroom.

### 2. Teaching and Learning Philosophy: Personal Statement

Beliefs, values, goals, and practices as they relate to teaching and learning have come to be known as one's teaching and learning philosophy. By the end of the course, you will write a statement of your teaching and learning philosophy. You will write, peer-review, and rewrite your teaching and learning philosophy. This will invite exposure to a range of ideas, lenses, and perspectives that can be used to refine your philosophy.

### 3. Micro-Teaching: A Research Approach to Teaching and Learning

Micro-teaching provides an opportunity to identify a concept, design a teaching strategy (i.e., design the learning plan describing how you will present and assess a particular concept), teach, reflect, and re-design the plan for both student understanding and your continuous improvement. A distinctive feature of this course will be the research approach to micro-teaching. You will identify questions intended to help you explore effective teaching strategies for yourself and your students. For example, what strategy would be most effective for helping students learn a specific concept in your discipline? How will you know? Have others had success with specific methods? If so, under what conditions? With what kinds of students? What research exists to demonstrate these results? What assessment technique/s would help you know that your students

understand the concepts? What worked? What didn't? What revisions are appropriate? How successful was the re-design? What questions will you ask your peers to help you answer as they observe your micro-teaching experience? You will come to view your classrooms as sites for ongoing research into your own teaching and will work to improve your teaching to increase your students' opportunities and potential for learning.

The learning plan you design could be for a concept you have taught in the past, one you re-taught in a discussion section, or one you experienced as a student. Each learning plan should have three key features:

- a. The plan should be something you could use in the future—such as a concept you could see yourselves teaching at some point.
- b. The plan needs to include activities that you would require your students to do to help clarify and/or solidify the concepts.
- c. The plan needs to include some type of assessment measure to determine how well “students” understand the concept you taught. This should include 1) some kind of summative assessment such as a quiz or homework question and 2) some type of ongoing formative assessment that you can use while you are teaching to guide your instruction.

Students will form groups of four with at least one other person in your discipline. (i.e., one group may have two mathematicians and two engineers; another group may have two biologists and two chemists). In pairs (i.e., the two biologists and the two chemists would pair up), you will work together to each design a task appropriate for your field of study. Each person will then teach their concept to the other three members of the group. The micro-teaching experience will be videotaped and all four will discuss the strengths and weaknesses of the activities and the learning plans. In pairs you will reconvene and revise the plan. Finally, your group will choose one plan or experience that stood out to share with the whole class on the last day of class. You will want to choose a plan that either changed the most from original to revised, one that was more challenging than first thought, or one that went extremely well after the revision. Your group will discuss with the whole class what you learned through the experience in addition to describing some of the details.

#### **4. Formative Assessment**

Students will have the opportunity to design and implement a formative assessment strategy for the course in which you are participating. You will sign up for a specific day in which you will implement some kind of formative assessment of the teaching strategies as they are presented. This is to encourage you to take the perspective of a learner while, at the same time, the perspective of the instructor. You will provide feedback to us as to the effectiveness of the task, what worked, what could use improvement, and how you would change it if you were to teach the same task in the future. You will meet with the instructors one day before the class you will be assessing. This visit will apprise you as to the expected learning outcomes and teaching strategies and, in turn, provide a foundation for reflecting what actually got taught (if it is different than the intent) and how much flexibility and adaptation was required.

### **Evaluation**

#### **1. Evaluation and grading**

Evaluation of student learning will be assessed in ways that correspond to the above experiences:

- a. Class participation and contribution with an emphasis on active and informed participation
- b. Timely completion of the two written responses to the reading questions
- c. Three versions of your teaching philosophy

- d. Micro-Teaching
- e. Activity of Choice

## 2. Credit value

Students may enroll for either three or two credits. Course grades will be determined according to the following structure:

### a. For **three** credits:

Participation/question posing	10%
Teaching philosophy	30%
Micro-teaching	40%
Activity of Choice	20%

### For **two** credits:

Participation/question posing	30%
Teaching philosophy	30%
Micro-teaching	40%

### b. Students may choose from the following list of options to fulfill the three-credit requirement:

- Curriculum vita (CV) or resume
- Daily journal of lessons learned
- Three observations of classes, faculty meetings, position interviews or job talk presentations with a one-page reflection of each
- Two- to five-year professional development plan
- Education-related paper or presentation for a professional organization
- Other, to be approved

## 3. Late policy

Late papers and incompletes will involve penalties as a matter of fairness and courtesy to everyone in the class. Instructors will not be able to provide extensive written feedback for late papers. Students who submit late or incomplete assignments will receive lower grades up to one letter grade lower for each day submitted past the due date.

## **Course Readings**

### **I. Assessment**

#### **I. A. Introduction to Assessment**

##### Required Reading

Resnick, L. B., & Resnick, D. P. (1992). Assessing the thinking curriculum: New tools for educational reform. In M. C. O'Connor (Ed.), *Changing assessments: Alternative views of aptitude, achievement and instruction* (pp. 37-75). Boston: Kluwer Academic Publishers.

##### Supplementary Reading

Shepard, L. A. (2001). The role of classroom assessment in teaching and learning. In V. Richardson (Ed.), *Handbook of research on teaching* (pp. 1066-1101). Washington, DC: American Educational Research Association.

Steen, L. (1999). Assessing assessment. In B. Gold & S. Z. Keith & W. A. Marion (Eds.), *Assessment practices in undergraduate mathematics* (pp. 1-5). Washington, DC: Mathematical Association of Recommended Texts.

#### **I. B. Traditional Assessments**

##### Required Reading

Conrad, C. and Kwako, J. "Handout: In-Depth Exploration of the Major Types of Assessment: Examples, Purposes, Content/Skills/Attitudes Addressed, Strengths and Weaknesses," pp. 1-4.

McKeachie, W. J. (2002). *McKeachie's teaching tips: Strategies, research, and theory for college and university teachers* (11<sup>th</sup> edition). Boston, MA: Houghton Mifflin Co, pp. 91-96

##### Supplementary Reading

Ritter, L. (2000). The quest for an effective form of assessment: The evolution and evaluation of a controlled assessment procedure (CAP). *Assessment and Evaluation in Higher Education*, 25(4), 307-320.

Magone, M. E., Cai, J., Silver, E. A., & Wang, N. (1994). Validating the cognitive complexity and content validity of a mathematics performance assessment. *International Journal of Educational Research*, 3(21), 317-340.

#### **I.C. Alternative Assessments (Journals, Collaborative Testing, Student Writing, Portfolios, Observations, Open-Ended Problems, Self-Assessment)**

##### Required Reading

Conrad, C. and Kwako, J. “Handout: In-Depth Exploration of the Major Types of Assessment: Examples, Purposes, Content/Skills/Attitudes Addressed, Strengths and Weaknesses,” pp. 5-17.

#### Supplementary Reading

Black, P., & William, D. (1998). Inside the black box. *Phi Delta Kappan*, 80(2), 139-148.

Shafer, M. C., & A. Romberg, T. (1999). Assessment in classrooms that promote understanding. In E. Fennema & T. A. Romberg (Eds.), *Mathematics classrooms that promote understanding* (pp. 159-184). Mahwah, New Jersey: Lawrence Erlbaum Associates.

### **I.D. Issues Surrounding Assessment: Cheating and Plagiarism, and Grading**

#### Required Reading

Conrad, C. and Gislason, K. “Handout: Issues Surrounding Assessment: Cheating & Plagiarism, and Grading,” pp. 1-5.

McKeachie, W. J. (2002). *McKeachie's teaching tips: Strategies, research, and theory for college and university teachers* (11<sup>th</sup> edition). Boston, MA: Houghton Mifflin Co, pp. 97-115.

#### Supplementary Reading:

Esty, W. W., & Teppo, A. R. (1992). Grade assignment based on progressive improvement. *Mathematics Teacher*, 85(8), 616-618.

Hagelgans, N. (1999). Combining individual and group evaluations. In B. Gold & S. Z. Keith & W. A. Marion (Eds.), *Assessment practices in undergraduate mathematics* (pp. 134-136). Washington, DC: Mathematical Association of America

## **II. TEACHING AND LEARNING, TEACHERS AND LEARNERS**

### **II. A. A Paradigm Shift from Instructor-Centered to Teaching- and Learning-Centered**

#### Required Reading

Barr, R. B., & Tagg, J. (1995). From teaching to learning: A new paradigm for undergraduate education. *Change*, 27(6), pp. 697-710.

Newmann, F. M. (1991). Linking restructuring to authentic student achievement. *Phi Delta Kappan*, 72(6), 458-463.

## **II. B. Perspectives on Teaching and Teachers**

### **1. Teaching: Didactic, Facilitative, and Collaborative**

#### Required Reading

McKeachie, W. J. (2002). *McKeachie's teaching tips: Strategies, research, and theory for college and university teachers* (11<sup>th</sup> edition). Boston, MA: Houghton Mifflin Co, pp. 30-69, 169-244, 250-267.

Wright, J. C. (1996). Authentic learning environments in analytical chemistry using cooperative methods and open-ended laboratories in large lecture classes. *Journal of Chemical Education*, 73(9), 827-832.

Conrad, C. F., Haworth, J. G., & Millar, S. B. (1993). **Primary Decision-Situations: Approach to Teaching and Learning, Program Orientation, and Departmental Support.** *A silent success: Master's education in the United States*. Baltimore, MD: Johns Hopkins University Press, pp. 49-67.

Feldman, K. A. (1988). Effective college teaching from the students' and faculty's view: Matched or mismatched priorities? *Research in Higher Education*, 28(4), 291-344.

Brookfield, Steven D. *What it means to be a critically reflective teacher*, 527-540.

### **2. Teachers: (Re)visioning Teachers**

#### Required Reading:

Palmer, P. (1998). *The courage to teach: Exploring the inner landscape of a teacher's life*. (1st ed.). San Francisco, CA: Jossey-Bass, pp. 1-183.

Finkel, D. L., & Monk, G. S. (1983). Teachers and learning groups: Dissolution of the atlas complex. In C. Gouton & R. Y. Garth (Eds.), *Learning in groups: New directions for teaching and learning* (Vol. June, pp. 83-97). San Francisco: Jossey-Bass.

Schoenfeld, A. (1985). What's all the fuss about metacognition? In A. Schoenfeld (Ed.), *Cognitive science and mathematics education* (pp. 189-215). Hillsdale, NJ: Lawrence Erlbaum Associates.

## **II.C. Perspectives on Learning and Learners**

#### Required Reading:

McKeachie, W. J. (2002). *McKeachie's teaching tips: Strategies, research, and theory for college and university teachers* (11<sup>th</sup> edition). Boston, MA: Houghton Mifflin Co, pp. 118-160.

Fincher, C. (1985). Learning theory and research. In J. C. Smart (Ed.), *Higher education handbook of theory and research*. Flemington, NJ: Agathon Press, pp. 57-80.

Karp, D. A., & Yoels, W. C. (1976). The college classroom: Some observations on the meanings of student participation. *Sociology and Social Research*, 60(4), 421-439.

MacGregor, J. T. (1990). Collaborative learning: Shared inquiry as a process of reform. *New Directions for Teaching and Learning*, 42(Summer), 19-30.

Supplemental Reading:

Carpenter, T., & Lehrer, R. (1999). Teaching and Learning Mathematics With Understanding. In E. Fennema & T. Romberg (Eds.), *Mathematics Classrooms That Promote Understanding* (pp. 19-32). Mahwah, NJ: Erlbaum.

Heller, P., Keith, R., & Anderson, S. (1992). Teaching problem solving through cooperative grouping: Part I: Group versus individual problem solving. *American Journal of Physics*, 60(7), 627-644.