COURSE SYLLABUS

Seminar in Mathematics Education Research, Fall 2010 (16:300:661)
HYBRID COURSE: online work and campus meetings on Weds, 4:50-7:30, GSE Room 30
Graduate School of Education, 10 Seminary Place, CAC

CONTACT INFO

Instructor	Carolyn Maher	carolyn.maher@gse.rutgers.edu	(732) 932-8848
Instructional Support		marjory.palius@gse.rutgers.edu	(732) 932-7496 ext. 8159

OFFICE HOURS

By appointment

OBJECTIVES

This course is designed to prepare you to conduct research in mathematics education through a variety of activities that include examining ethical and methodological issues in conducting research, learning from experienced researchers, critically reviewing research literature, and writing scholarly reflective analyses. For students nearing the end of course work in their Ed.D. or Ph.D. program, it is expected that they make progress on their dissertation research proposal. All students are encouraged to assimilate into the research community and participate in professional research meetings (e.g., PME-NA, PME, AERA and NCTM Research Pre-session). For some, the preparation of posters, short orals and research reports and symposia may be a goal. You will be exposed to experienced researchers' presentations through guest lectures and will use those experiences, with additional guidelines to be provided, in developing your own PowerPoint presentation to share some aspect of your project work from this course. The setting of specific goals will be negotiated early in the course (first meeting or shortly thereafter) based on individual interests and objectives for advancing from where you are now.

COURSE REQUIREMENTS

Successful completion of the course requires that actively engage in all activities and submit all assignments. This process requires that you:

1. Attend on-campus class sessions and guest lectures. Submit one page reaction to guest lectures. Be an active participant on line and in class.
2. Engage in online activities through the Pearson eCollege/eCompanion course web site. Students will be put into small groups for threaded discussions and collaborative work. You must participate in these activities as an individual posting your ideas to group work and by responding to the ideas posted by others in your group. Your voice must be heard (i.e., visible) as a contributor to discussions and other group work. It is insufficient to merely read what others say; you must contribute your own thoughts and reactions by posting to the site with questions, interpretations, responses, etc.

3. Attain IRB Certification to conduct Human Subjects Research. If you have not already become certified you must do so by March 15, 2013. Send email to Instructor (Maher and Palius) with your date of certification and/or copy of the letter documenting certification. Human Subjects Certification can be obtained through completion of an online (Sakai) course. Anticipated time of completion is three hours, and information about to proceed can be found at the following website: http://orsp.rutgers.edu/humans/HSCPLetter.php
4. Complete all individual and group project assignments: These include but are not limited to:
    a. Contribute to a literature review for an assigned topic
    b. Conduct an individual written review of one dissertation
    c. Attend at least one dissertation/proposal defense
    d. Show knowledge of library search for publications
5. Complete assigned readings and related assignments, including participation in class and/or online discussions of readings and written reflective analyses, reviews, etc.
6. Present results of group literature reviews and project work with PowerPoint presentation that also includes potential research questions that could be addressed in future research.

Note that the details of specific assignments will be posted to the eCollege/eCompanion course web site, although assignments also may be discussed in some detail during face-to-face meetings. The following table is a projected course outline with some assignments noted, but the exact schedule of assignments may be adjusted as we proceed with the course. However, we will follow the schedule with regard to dates when we meet on campus.

COURSE OUTLINE AND ASSIGNMENTS

1/28/2013	**On-campus meeting: Discussion on several topics** 1. What is a research agenda? How does one establish a research agenda? What are considerations in conducting research? 2. What is IRB? Why are issues of integrity important? Discuss research with human subjects and their rights. Getting IRB certified. **IRB Certification to be completed by midterm (3/15/2013).** 3. What are your research experiences, if any? 4. Organization of small groups according to research interests 5. Discussion of Freudenthal article (i.e., read it before first class meeting) Freudenthal, H. (1968). Why to teach mathematics so as to be useful. *Educational Studies in Mathematics 1*, 3-8. Reading Assignment: Brownell, W. A. (2004). The place of meaning in the teaching of arithmetic. In T. P. Carpenter, J. A. Dorsey and J. L. Koehler (Eds.), Classics in Mathematics Education Research (*Elementary School Journal 47* (1947): 256-265), pp. 8-15. National Council of Teachers of Mathematics: Reston, VA. Small group discussion of Brownell article. Guiding questions will be posted online.

2/4/2013	**On-campus meeting: Discussion on several topics** **Guest Speaker:** Professor Shlomo Vinner, "What Should We Expect from Somebody Who Teaches Mathematics in Elementary Schools?" 1. Be prepared to discuss Brownell article as a full group. Reading Assignment: Review dissertation of Maria Steffero (posted to our course site) Small group online discussions of (1) Steffero dissertation; (2) Professor Vinner's talk Guiding questions will be posted on line.
2/11/2013	**On-campus meeting: Discussion on several topics** 1. Be prepared for full class discussion of Dr. Steffero's dissertation and Professor Vinner's talk. 2. Select two articles to lead class discussion from NCTM Classics in Mathematics Education Research 3. Select a dissertation for individual reporting.
2/18/2013	**On-campus meeting:** Initiate (1) small group project work; (2) Alexander Library Demonstration and literature searches, and using RefWorks bibliographic tool Reading Assignment: Maher, C. A. & Weber, K. (2010). Representation Systems and Constructing Conceptual Understanding. Special Issue of the *Mediterranean Journal for Research in Mathematics Education 9*(1), 91-106.
2/25/2013	**On-campus meeting with small groups to prepare for project work.** Staples, M. (2007). Supporting whole-class collaborative inquiry in a secondary mathematics classroom. *Cognition and Instruction, 25*(2), 161-217
3/4/2013	**On-campus meeting:** **(1)** Groups report on project work (approximately 30 minutes per group). Please prepare PowerPoint to show (1) Objective(s); (2) Literature to be Reviewed; (3) Research Question(s) **(2)** Individuals select "Classic" papers for leading discussions
3/11/2013	**On-campus meeting:** **Online activities:** Reading Assignments with online discussion component during March 11-17: Maher, C. A. (1999). Mathematical thinking and learning: a perspective on the work of Robert B. Davis. *Mathematical Thinking and Learning, 1* (1), 85-91. Maher, C. A. & Martino, A. M. (1996). The development of the idea of mathematical proof: A 5-year case study. In F. Lester (Ed.), *Journal for Research in Mathematics Education, 27* (2), 194-214.
3/18/2013	**Spring Break**

3/25/2013	**1. Group project work** **2.** Researching Special Collections: Hassler Whitney, Robert B. Davis (GSE) The Robert B. Davis Special Archived Collection The Hassler Whitney Collection Reading Assignment: Tsamir, P. (2008). Using theories as tools in mathematics teacher education. In D. Tirosh and T. Wood (Eds.), *International Handbook of Mathematics Teacher Education: Vol. 2: Tools and Processes in Mathematics Teacher Education* (pp. 211-234). Rotterdam, The Netherlands: Sense Publishers.
4/1/2013	**On-campus meeting:** **Group project reports**
4/8/2013	**On-campus meeting:** **Individual "Classics" discussions**
4/15/2013	**On-campus meeting:** Guest Lecture by Prof. Gerald A. Goldin (? – pending confirmation) **Individual "Classics" discussions**
4/22/2013	**On-campus meeting:** **Group project reports**
4/28/2013	**Online class** Work in Groups for preparing power points for preparing final group projects
5/6/2013	**On-campus meeting:** **Final Reports and Presentations**
5/13/2013	**On-campus meeting:** **Individual Reports, Project/Literature Reviews, Group Reports, Reflective Essays Due.**

GRADING

You will receive a grade for this course based on the quality of your work for each of the required components of class activities and assignments, with those contributing factors weighted as follows:

Face-to-face Classroom Discussions	10%
Small Group Online Discussions	30%
Individual Review of a Dissertation	5%
Individual Reaction Papers to Guest Lectures	5%
Individual (or paired) Review of two "Classics" Chapters	20%
Literature Review with Group Presentation	30%

References (of assigned and recommended readings)

Brownell, W. A. (2004). The place of meaning in the teaching of arithmetic. In T. P. Carpenter, J. A. Dorsey and J. L. Koehler (Eds.), Classics in Mathematics Education Research (*Elementary School Journal 47* (1947): 256-265), pp. 8-15. National Council of Teachers of Mathematics: Reston, VA.

Carpenter, T. P., Dorsey, J. A., & Koehler, J. L. (Eds.) (2004). *Classics in Mathematics Education Research*. National Council of Teachers of Mathematics: Reston, VA.

Davis, R. B., Maher, C. A. & Noddings, N. (Eds.) (1990). *Constructivist views on the teaching and learning of mathematics: Journal for Research in Mathematics Education, Monograph No. 4*. Reston, VA: National Council of Teachers of Mathematics.

Freudenthal, H. (1968). Why to teach mathematics so as to be useful. *Educational Studies in Mathematics 1*, 3-8.

Maher, C. A. (1999). Mathematical thinking and learning: a perspective on the work of Robert B. Davis. *Mathematical Thinking and Learning, 1* (1), 85-91.

Maher, C. A. & Martino, A. M. (1996). The development of the idea of mathematical proof: A 5-year case study. In F. Lester (Ed.), *Journal for Research in Mathematics Education, 27* (2), 194-214.

Maher, C. A. & Weber, K. (2010). Representation Systems and Constructing Conceptual Understanding. Special Issue of the *Mediterranean Journal for Research in Mathematics Education 9*(1), 91-106.

Staples, M. (2007). Supporting whole-class collaborative inquiry in a secondary mathematics classroom. *Cognition and Instruction, 25*(2), 161-217.

Tsamir, P. (2008). Using theories as tools in mathematics teacher education. In D. Tirosh and T. Wood (Eds.), *International Handbook of Mathematics Teacher Education: Vol. 2: Tools and Processes in Mathematics Teacher Education* (pp. 211-234). Rotterdam, The Netherlands: Sense Publishers.