RUTGERS
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Topics in Math Education: Lesson Study on Reasoning (Southern region)
15:254:599:82
3 Credits

Instructor: Dr. Judy Landis	Jlandis19@yahoo.com
Phone Number 609-937-2298	
Office Hours: by appointment	Prerequisites or other limitations: Admission to NJPEMSM program
Mode of Instruction: ___ Lecture ____ Seminar _X_ Hybrid ___ Online ___ Other	Permission required: __ No _X_Yes Contact Marjory Palius Marjory.palius@gse.rutgers.edu

Individual Meeting Opportunities

By appointment in district on the classroom visitation and/or regional meeting days

Course Overview

This course is designed as a practical research-based set of experiences focusing on the development of reasoning and justification. Participants will engage in a variety of activities that blend in-person, on-campus meetings, smaller regional sessions, and in-school implementations with interactions done asynchronously online through a course web site.

The on-campus and regional activities will include working in small groups on a series of mathematical problem-solving tasks, discussing possible modifications for specific classroom use, and sharing the actual experiences and student work resulting from follow-up implementations by each of the participants.

The online course work will include reading assignments that relate to each of the problem tasks within the overall focus of students' reasoning and justification. Online course assignments will also include video clips of children engaged in solving the same or similar problem tasks as those introduced in the group sessions. Each assignment will include guiding questions to elicit small group reflection and discussion of the readings and their relevance to learning and teaching.

Particular emphases for each assignment will be on the mathematics, children's learning, and conditions of the learning environment. Examples will be selected from the content strand of counting and combinatorics, from early years through high school, and participants will be expected to consider implications drawn from their own practice in light of research for instruction and NCTM Standards.

As one component of the course, each participant will complete assessments (pre and post) for measuring the impact of course activities in the focal mathematical strand on what you notice and how you describe what you observe in a video episode and a set of student products, as well as on participant beliefs about learning and teaching math. Completing the assessments is not optional; it is a course requirement. However, each participant will be given a consent form about whether assessments can be among those analyzed for ongoing research.

COURSE REQUIREMENTS

You are invited to be an active participant in the class through small group work in the general and regional meetings and through web-based discussions, classroom implementations, projects, and writing. Successful completion of the course requires that you engage in all activities and submit all assignments. You are required to:

1. Complete all pre- and post-assessments.

2. Attend all on-campus and regional sessions.

3. Actively participate in online discussions as you engage with assignments (readings and videos) and respond to guiding questions as posted on the eCompanion course website. Each week, you are required to make at least one original posting **by Saturday afternoon** and respond to at least two group member postings **by the following Tuesday.**

4. Be knowledgeable of all the assigned readings and video clip viewings.

5. Complete an ***Individual Final Project.*** Individually, participants will complete a summary narrative of their implementations of the problem tasks with their students. This narrative, accompanied by student work and other artifacts from the terms activities are to become a booklet that will be shared with everyone in the three regions at the **December 7th** final meeting. Included in this final project will be a ***reflective assessment*** of your work in the course. You should reflect on your knowledge of the mathematics, research on how students learn, and implications for teaching with regard to NCTM Standards. You may review your postings on the course web site and notes from problem solving and sharing of solutions as you develop your reflective assessment.

6. You will be evaluated on your work products for the individual final project, completion of all pre- and post-assessments, and your participation both in person and on line.
   Individual Final Project: 40 %
   Participation in Person: 30 %
   Participation On-Line: 30 %

7. Policy on Academic Integrity: You are responsible for knowledge of and will be held accountable to the Academic Integrity at Rutgers policy found at http://academicintegrity.rutgers.edu.

COURSE OUTLINE AND ASSIGNMENTS

9/07/2013 **ON-CAMPUS**	**Class Activities:** Introduction to the course; Engage in 5-tall Towers task, selecting from 2 colors, with problem extensions and focused discussion about representations. Review syllabus and discuss course requirements.
9/11/2013 **ON-LINE**	**All teachers will implement Task I in their classrooms between 9/16and 9/27.** **On-line Activities:** Respond to the guiding questions to be posted online about the implementation of Task I.
9/18/2013 **ON-LINE**	**All teachers will implement Task I in their classrooms between 9/16 and 9/27.** **On-line Activities:** Respond to the guiding questions to be posted online for engagement in threaded discussion about the various towers problem-solving tasks and related videos and readings. **Assigned Reading:** Maher, C.A., Powell, A.B. & Uptegrove, E. (Eds) (2010) *Combinatorics and reasoning: Representing, justifying and building isomorphisms.* New York: Springer Publications. Chapter 3 **Videos:** Clips to be posted on course web site: PUP Math, Stephanie and Dana, grade 3; Meredith Removes the Top Cube
9/25/2013 **ON-LINE**	**All teachers will implement Task I in their classrooms between 9/16 and 9/27.** **On-line Activities:** Respond to the guiding questions to be posted online for engagement in threaded discussion about the various towers problem-solving tasks and related videos and readings. **Assigned Reading:** Maher, C.A., Powell, A.B. & Uptegrove, E. (Eds) (2010) *Combinatorics and reasoning: Representing, justifying and building isomorphisms.* New York: Springer Publications. Chapters 4 and 5

	Videos: Clips to be posted on course web site: PUP Math, Stephanie and Dana, grade 4; Milan Shares His Inductive Argument
10/02/2013 **FIRST REGIONAL GROUP MEETING**	**In-school activities: Instructor will implement task I** with teacher in one of the districts on **10/2**. **All teachers will ask to be released to observe and debrief after this classroom implementation.** **All teachers will implement Task II in their classrooms between Oct 3 and Oct 21.** At Regional Meeting – Teachers will share classroom experiences and student work from Task I. Engage in pizza problem task: pizzas, selecting from 4 toppings. Share how solutions were found and examine representations used in problem solving. Discuss isomorphism. Consider how these tasks might be used in classroom instruction. **On-line Activities:** Respond to the guiding questions posted online for engagement in threaded discussion about the assigned readings and videos. **Assigned Reading:** Maher, C.A., Powell, A.B. & Uptegrove, E. (Eds) (2010) *Combinatorics and reasoning: Representing, justifying and building isomorphisms.* New York: Springer Publications. Chapter 6 **Assigned Video**: Brandon Invents Isomorphism Share observations/ impressions of video.
10/9/2013 **ON-LINE**	**All teachers implement Task II in their classrooms between Oct 3 and Oct 21.** **On-line Activities:** Respond to the guiding questions to be posted online for engagement in threaded discussion about the second task and related videos and readings. **Assigned Reading:** Maher, C. A. & Martino, A. (1998). "Brandon's Proof and Isomorphism". In C. A. Maher, *Can teachers help children make convincing arguments? A glimpse into the process.* Rio de Janeiro, Brazil: Universidade Santa Ursula.
10/16/2013	**All teachers implement Task II in their classrooms between Oct 3 and Oct 21.** **Online Activities:** Respond to the guiding questions to be posted online about student work and implementation experiences from Task II: Pizza

ON-LINE	problem.
10/23/2013 **SECOND REGIONAL GROUP MEETING**	**In-school activities: Instructor will implement task II** with teacher in one of the districts on **10/23**. **All teachers will ask to be released to observe and debrief after the classroom implementation.** **All teachers implement Task III in their classrooms between Oct 24 and November 16.** Regional Meeting: Share classroom implementation experiences and student work from Task II. Engage in Task III: building 3-tall towers, selecting from 3 colors, and extension problem, Ankur's Challenge. Share how solutions were found and examine representations used in problem solving. Consider how these tasks might be used in classroom instruction. **Online Activities:** Respond to the guiding questions to be posted online for engagement in threaded discussion about ideas from Towers with 3 colors and Ankur's Challenge, with focus on reasoning and proof in mathematics. **Video:** Romina's Proof
10/30/2013 **ON-LINE** _____	**All teachers implement Task III in their classrooms between Oct 24 and November 16.** **On-line Activities:** Respond to the guiding questions to be posted online for engagement in threaded discussion about the assigned reading. **Assigned Reading:** Maher, C.A., Powell, A.B. & Uptegrove, E. (Eds) (2010) *Combinatorics and reasoning: Representing, justifying and building isomorphisms.* New York: Springer Publications. Chapter 8 _____
11/06/2013 **ON-LINE**	**All teachers implement Task III in their classrooms between Oct 24 and November 16.** **Online Activities:** Respond online to guiding questions about the implementations and student work from the first two tasks.

11/13/2013 **ON-LINE**	**All teachers implement Task III in their classrooms between Oct 24 and November 16.** **Assignments –** Guidelines to be posted for preparing final projects and reflective narratives. Begin work on final projects and reflective narratives.
11/20/2013 **THIRD REGIONAL GROUP MEETING**	**In-school activities: Instructor will implement Task III** with teacher in one of the districts **Nov 20**. **All teachers will ask to be released to observe and debrief after the classroom implementation.** **Third Regional Meeting:** Share classroom experiences and student work from Task III. Discuss final project presentations for December 7th on-campus meeting. **Assignment:** Preparation of final project and reflective narrative.
11/27/2013 **On-Line**	**Assignment:** Preparation of final project and reflective narrative.
12/07/2013 **ON-CAMPUS** _____ **12/11/2013**	**FINAL PROJECT and REFLECTIVE NARRATIVES DUE.** **Class Activity:** Sharing of Final Projects. _____ **ALL ON-LINE POST ASSESSMENTS ARE DUE FRIDAY, DECEMBER 13th**

Notes about reading assignments:

Primary reading assignments come from:

Maher, C. A., Powell, A. B. & Uptegrove, E. (Eds.), (2010). *Combinatorics and reasoning: Representing, justifying and building isomorphisms*. New York: Springer Publishers. Information will be forthcoming about the possibility of purchasing this volume as an eBook from Springer Publishing Company.

Additional assigned readings will be announced and made available through the eCompanion site for this course.

As a general guideline for engaging in online discussions, we offer a few words on "Netiquete".

This is drawn from Palloff, R. M., & Pratt, K. (1999). *Building learning communities in cyberspace*. San Francisco: Jossey-Bass, p. 101.

a. Check the discussion frequently and respond appropriately and on the subject.

b. Focus on one subject per message and use pertinent, informative, and not-too-long subject titles

c. Capitalize words only to highlight a point or for titles. Capitalizing otherwise is generally viewed as SHOUTING.

d. Be professional and careful with your online interaction

e. Cite all quotes, references, and sources.

f. When posting a long message, it is generally considered courteous to warn readers at the beginning of the message that is a lengthy post.

g. It is inappropriate to forward someone else's message(s) without their permission.

h. Use humor carefully. The absence of face-to-face cues can be misinterpreted as angry, antagonistic criticism.