Rutgers, The State University of New Jersey

05:300:441:02 Teaching Mathematics in the Elementary School, 3 credits
Fall 2015
Wednesday, 9:50am-12:50pm
Graduate School of Education, Room 30

Instructor: Marjory Palius
Email: marjory.palius@gse.rutgers.edu
Phone Number: 848-932-0803
Office Hours: Wednesday, 1pm-3pm
(Location: GSE-232)
Prerequisites or other limitations:
Admission to the Teacher Education Program

Mode of Instruction:
_x_ Lecture
__ Seminar
__ Hybrid
__ Online
__ Other
Permission required:
_x_ No
_x_ Yes
Directions about where to get permission numbers: Contact the office of academic services at the GSE

Rutgers University welcomes students with disabilities into all of the University’s educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: https://ods.rutgers.edu/students/documentation-guidelines. If the documentation supports your request for reasonable accommodations, your campus’s disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: https://ods.rutgers.edu/students/registration-form.

Course Description

Learning goals:

New Jersey Professional Standards for Teachers (2014)¹:

| Standard 1. Learner Development | The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary |

¹ http://www.state.nj.us/education/code/current/title6a/chap9.pdf
| Standard 2.  
Learning Differences | The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards. |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standard 3.  
Learning Environments | The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self motivation. |
| Standard 4.  
Content Knowledge | The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches, particularly as they relate to the Common Core Standards and the New Jersey Core Curriculum Content Standards and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content. |
| Standard 5.  
Application of Content | The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues. |
| Standard 6.  
Assessment | The teacher understands and uses multiple methods of assessment to engage learners in examining their own growth, to monitor learner progress, and to guide the teacher’s and learner’s decision-making. |
| Standard 7.  
Planning for Instruction | The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context. |
| Standard 8.  
Instructional Strategies | The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways. |
| Standard 9.  
Professional Learning | The teacher engages in ongoing individual and collaborative professional learning designed to impact practice in ways that lead to improved learning for each student, using evidence of student achievement, action research, and best practice to expand a repertoire of skills, strategies, materials, assessments, and ideas to increase student learning. |

**Course catalog description:**

Focus on numeration skills, counting, place value and number base, and the four basic arithmetic operations as they are taught to, and learned by, elementary school children.

**Other description of course purposes, context, methods, etc.:**

This course has been designed to focus both on the details of children’s mathematics thinking, as well as how to use student thinking as a way to ground learning about the teaching of mathematics. The class will focus on preparing you to begin your career and
learn as you teach. As we address student thinking and instructional routines, we will also discuss ways to accommodate various learners and critical aspects of the teaching and learning of mathematics and equity (racial, ethnicity, SES, gender, language, (dis)ability), the use of mathematical tools, and pedagogically meeting the needs of all students. We will specifically discuss pedagogical strategies to support English Language Learners (ELLs). We will use the state content standards, readings, student work, classroom video, curricula, your practicum placement, instructional scenarios, including designing and implementing lessons to examine these issues. Additionally, we will discuss Student Growth Objectives (SGOs), PARCC (the new state assessment), and the Danielson Framework for Teaching (DFFT) in preparation for your future work in schools. Learning goals are to develop:

- knowledge of the mathematics in the elementary grades
- detailed knowledge about the development of children’s mathematical thinking
- ways to build instruction based on the development of students mathematical thinking
- a repertoire of pedagogical techniques and routines related to the above
- an understanding of equity and access inside and outside of the mathematics classroom and modifications for various learners
- a disposition to reflect on your role as a mathematics teacher within a community

**Required texts:**


Other readings will be available electronically

**Grading policy:**

The grading will be as follows -
A = 100-90% B+= 89-87% B = 86-80% C+= 79-77% C = 76-70% D = 69-60%
F < 60%

**Evaluation of Written Work:**

Your written work will be graded on the clarity of your writing and fulfilling the requirements of the assignment.

As your instructor, I will give you feedback and comments on your homework and assignments. I view all assignments as measures of process, not final measures of knowledge. Just because an assignment is completed does not mean that you (or I) should stop thinking about the implications of the assignment. If you have additional ideas about assignments after they are due,
I encourage you to share those with me. Ideas about teaching mathematics develop over time and cannot be conceptualized on a deadline. However, I do expect assignments to be completed on time so that I can see your progress.

**Academic Integrity Policy:**
Any violation of academic honesty is a serious offense and is therefore subject to an appropriate penalty. Refer to [http://academicintegrity.rutgers.edu/integrity.shtml](http://academicintegrity.rutgers.edu/integrity.shtml) for a full explanation of policies.

**Web site:**
[http://sakai.rutgers.edu](http://sakai.rutgers.edu), course TCHNG MATH ELEM SCH 02 F15

**Course Requirements**

**Attendance (this policy is separate from the participation grade):** You are allowed ONE absence, which I will assume is for a good reason. Beyond that, your final grade will be reduced as indicated (unless, of course, you have a doctor's note or other documentation indicating a bona fide reason): 2 absences—reduction of a half grade; 3 absences—reduction of 1 full grade; 4 absences—failing grade in course. Again, if it is an excused absence, you are responsible for contacting me, getting the course materials, and making up for the class in order to receive the participation points.

**Class Participation (28 points):** You are expected to participate in class. Each week you will have readings and you will need to be prepared to discuss the content of the readings and ask questions in class. Aside from the readings, we will be engaging in many discussions, group work, and individual activities in class. Your engagement in the course determines how successful the class will be and how much you will learn. You can earn a maximum of 2 points each class for in-class participation, individual assignments, completing the readings, and completing group work. If you miss a class for an excused absence, you can make up the points by doing out of class activities. We only have 42 hours to explore different ways to think and teach mathematics and then you need to be able to teach math on your own! We need to make the most of this limited time together.

**Discussion Forum Postings (15 points):** Each student is required to make 5 postings on the Sakai forum for threaded discussions. You will be given topics to investigate (e.g. questioning, group work) each week in your practicum placement, and topics arise related to readings and videos. You can choose the 5 weeks you want to post in the forum discussions. However, I urge you to space them out to get optimal benefits from this mode of reflective discussion (e.g., post once during weeks 1-3, 4-6, 7-10, 11-12 and 13-14). You will receive points for your postings if they are thoughtful and relate to class topics.

To maintain high quality discussions, here are some guidelines:
- Post in a timely manner. Do not save course reading or postings until the last minute. Because part of your responsibilities will include responding to your peers’ posts, a late post can jeopardize your peers’ contributions and grades.
- Provide thoughtful, detailed responses to questions and your peers’ posts. It is necessary to support your opinions and ideas with material from our class readings and discussions.
- Use academic language (not “texting language” you might use on a cell phone with friends) for your on-line contributions. Make sure you cite material/text/concepts from other sources.
Family Math Night (15 points): You will participate in the design and carrying out of Family Math Night in groups at your practicum placement school. Of course this should be fun for parents, but the main goal is to help parents both think about critical mathematical ideas as well as find new ways to support their children in understanding mathematics. You will turn in the activity you designed as well as a 2-page description of how it met the goals of the assignment. This may be an artifact that you choose to submit to the Teachscape portfolio exemplifying professionalism for DFfT domain 4 (particularly 4c).

Group Lesson Plan (15 points): You will be asked to develop a lesson plan in groups. Some time will be provided in class to work on this assignment. I will then give you feedback on the lesson plan. The goal is to demonstrate an understanding of the pedagogy discussed in class and to make the mathematics meaningful for students. Additionally this will prepare you for the Mathematics Lesson you will teach in your practicum. A rubric, template, and write-up examples will be posted on Sakai.

Mathematics Lesson (45 points): This has three parts, a lesson plan that needs to be approved by your practicum teacher, a video of yourself teaching the lesson, and a reflection on the lesson. All three parts will be submitted to your Teachscape portfolio.

Individual Lesson Plan (30 points): You will each write a lesson to be taught in your practicum classroom. Using what you learned from the group lesson plan, you will need to write a lesson plan that exemplifies teaching mathematics for understanding and have your practicum teacher approve and provide feedback on the lesson before you teach it in the classroom. The lesson plan will be rated primarily using DFfT domain 1.

Teaching video (required): The video does not need to show students, but does need to show you as the teacher practicing the pedagogy we’ve discussed in class in terms of modeling, questioning, assessing students, and providing feedback. The video will be rated primarily using DFfT domains 2 & 3.

Teaching Reflection (15 points): You are responsible to get feedback from a classmate on the video of the lesson. This should be written up in 1-2 pages. In addition to submitting this, you need to read their comments and reflect on details of the video including students’ thinking, the depth of the mathematics content covered, and your instruction practices. You should cite specific times in the video where you think you demonstrate teaching practices that are exemplary and areas where you could improve. The goal is to show you can be reflective and critical of yourself, but also that you know the types of instructional practices that produce substantive students learning in mathematics. The reflection should be 4-5 pages double-spaced. The reflection will be rated primarily using DFfT domain 4a.

Group Curriculum Development Project (30 points): You will revise a chapter in groups from an existing elementary mathematics curriculum. The focus of the curriculum development project is to meaningfully adopt, refine, and supplement existing curricular resources in ways that are aligned with children’s mathematical thinking. A description of the sequence of lessons, important content covered, and forms of student assessment must be provided. Your group’s project submission must highlight where and how mathematical problem solving plays a role in supporting children’s learning through the curriculum sequence. It is highly recommended to turn this in to the instructor for feedback before submitting it for a final grade. A rubric and template will be posted on Sakai.
Summary of Requirements

Attend all class sessions: 28 points
Five Discussion Forum posts: 15 points, due by end of course
Family Math Night: 15 points, due 10/7
Curriculum Development Project: 30 points, due 10/28
Individual Lesson Plan: 30 points, draft due 11/11, final 12/9
Teaching Reflection (and Video): 15 points, due 12/9

If you need ANY special accommodations during the course, please see me after the FIRST class.

Course Schedule by Week
(subject to change depending on weather, pacing, and student learning):

<table>
<thead>
<tr>
<th>Class Date</th>
<th>Topic and Standards</th>
<th>Readings Due</th>
<th>Assignments Due</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Introduction, Problem Solving, Making Mathematics Meaningful (1.6, 1.7, 4.9)</td>
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<td>September 2</td>
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<tr>
<td>Week 2</td>
<td>Addition and Subtraction Strategies &amp; Problem Types, Counting (1.8, 2.1, 4.1)</td>
<td>Sakai: Erlwanger</td>
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<td>September 9</td>
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<td>Sakai: Skemp</td>
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<td>Sakai: Khan article</td>
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<td>CM: Introduction and Ch 1</td>
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<td>Week 3</td>
<td>Addition &amp; Subtraction Student Strategies, Counting, Teacher Roles, Strategies for ELLs (1.4, 3.9, 4.5)</td>
<td>Sakai Friel</td>
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<td>September 16</td>
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<td>Sakai: Schwerdtfeger</td>
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<td>ST: Introduction</td>
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<td>Week 4</td>
<td>Counting and Multi-digit Strategies, Evaluation of Teaching Resources (1.9, 2.6, 2.8, 5.3)</td>
<td>ELLs: Ch 2</td>
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<td>September 23</td>
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<td>CM: Ch 2</td>
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<td>ST: CH1</td>
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<td>Week 5</td>
<td>Children’s Multi-digit Strategies, Mathematical Tools and Technology (2.3, 4.4, 4.5)</td>
<td>ST: Ch 2 and 3</td>
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<td>September 30</td>
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<td>Sakai: Nathan</td>
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<td>CM: Ch 3</td>
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</tbody>
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| Week 6  | October 7 | Algebraic Thinking & Relational Thinking, Questioning (1.5, 1.7, 2.1) | ST: Ch 5  
ELLs: Ch 6  
CM: Ch 6 | Family Math Night Assignment Due |
| Week 7  | October 14 | Multiplication and Division Strategies & Problem Types, Teaching for development differences (2.3, 2.7, 4.1, 4.3) | ELLs: Ch 3  
Sakai: Equal Sign  
CM: Ch 4 | Bring an idea for a task to class (you will use this for your individual lesson plan) |
| Week 8  | October 21 | Multi-digit Multiplication, Building on student lives (1.1, 2.7, 3.10) | ST: Ch 4, 6, Appendix B |  |
| Week 9  | October 28 | Multi-digit Division Strategies, and Assessment Strategies (1.1, 4.3, 4.11) | Sakai: NCTM 2001 Yearbook CH17 and 18 | Curriculum Development Project Due |
| Week 10 | November 4 | Fair Sharing, Multiple Representations, Connecting Instruction to Student Lives and Culture (2.2, 1.8, 3.9, 4.9) | Sakai: Fuson  
ELLs: Ch 5 |  |
| Week 11 | November 11 | Fractions, Mathematizing Social Issues (1.1, 1.4, 3.10) | Sakai: Karp  
Sakai: NCTM 2001 Yearbook CH 5 | Individual Lesson Plan Draft Due |
| Week 12 | November 18 | Fractions, Curricular Evaluation, Social Norms (1.1, 1.8, 4.8) | CM: Ch 7  
ELLs: Ch 1 |  |

**THERE IS NO CLASS ON NOV 25 – UNIVERSITY SCHEDULE IS FRIDAY**

| Week 13 | December 2 | Geometry, Using Technology and Tools (1.1, 1.2, 4.4) | Sakai: Taylor-Cox  
ELLs: Ch 7 | UPLOAD YOUR TEACHING VIDEO TO TEACHSCAPE BY 12/9 |
| Week 14 | December 9 | Data Analysis, Mathematizing Social Issues (1.4, 4.3, 4.9) |  | Teaching Reflection Due Last Day to turn in Individual Lesson Plans UPLOAD BOTH TO TEACHSCAPE |