



Graduate School of Education

Learning and Teaching  
Graduate School of Education  
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**Rutgers, The State University of New Jersey**

**15:254:543:01 Background for Teaching Elementary School Mathematics, 3 credits**

**Fall 2014**

**Tuesdays, 7:40pm-10:20pm**

**Graduate School of Education, Room 25A**

Instructor: Robert Sigley	Email: Robert.sigley@gse.rutgers.edu
Phone Number : 848-932-0776	Location: GSE-213
Office Hours: Tuesday 6:30-7:30 and by appointment	Prerequisites or other limitations: <i>Admission to the Teacher Education Program</i>
Mode of Instruction: <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Seminar <input type="checkbox"/> Hybrid <input type="checkbox"/> Online <input type="checkbox"/> Other	Permission required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Directions about where to get permission numbers: Contact me

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 documentations: <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)<sup>1</sup>:**

<b>Standard 1.</b> Learner Development	The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary
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<sup>1</sup> <http://www.state.nj.us/education/code/current/title6a/chap9.pdf>

<b>Standard 2.</b> 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.
<b>Standard 3.</b> 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.
<b>Standard 4.</b> 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.
<b>Standard 5.</b> 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.
<b>Standard 6.</b> 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.
<b>Standard 7.</b> 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.
<b>Standard 8.</b> 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
<b>Standard 9.</b> 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 in preparation for your future work in schools.

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

Continue to reflect on your role as a mathematics teacher within a community.

**Required texts:**

Featherstone et al. (2011). **(ST)** Smarter Together! Collaboration and Equity in the Elementary Math Classroom. NCTM. (ISBN: 978-0-87353-656-1)

Carpenter et al. (1999). **(CM)** Children's Mathematics: Cognitively Guided Instruction. Heinemann. (ISBN: 978-0325001371)

Coggins et al. (2007). **(ELLs)** English Language Learners in the Mathematics Classroom. Corwin Press. (ISBN: 978-1412937603)

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> for a full explanation of policies.

### **Web site:**

<http://sakai.rutgers.edu>, course TCHNG EL SCH MATH I 01 F14

## **Course Requirements**

**Attendance Policy** (*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.

### **Course assignments:**

**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 Board Postings (15 points)**: Each student is required to make 5 postings on the Sakai discussion board. Of these 5 postings, at least 1 should be a thread that you initiate. All postings should be related to the teaching and learning of mathematics, your practicum, readings, and class discussions. 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.

Introduction Letter to Parents (15 points): You will write a letter to the parents of your students introducing yourself. Include your background, what grade you are teaching, and what your expectations are for their children. I also want you to choose a topic (e.g., teaching addition) and explain how you will teach the subject conceptually and why it is important to take this approach vs. teaching the students algorithms. Offer ways the parents can help their children without giving them the answer. The letter should be approximately two pages. I encourage you to upload this assignment to Teachscape under the Communication with Parents requirement.

Teaching Reflection (15 points): You will teach and film yourself in your practicum classroom. The video you take must be uploaded to Teachscape and it will be graded on the Danielson framework for Domains 2 and 3 (the rubric will be posted onto the course website). Afterwards you will write a reflection about your experience. The reflection should be 2-3 pages double-spaced and address the classroom organization, mathematical content, and the pedagogical techniques that you used. **You must also upload this teaching reflection to teachscape.**

Group Curriculum Development Assessment (15 points): In class together, we 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. With your group you will develop an assessment that can be used as an end of unit test. Your assessment should focus on testing the students conceptual knowledge not their ability to do computations.

Individual Lesson Plan (50 points): You will need to write a detailed lesson plan that exemplifies teaching mathematics for understanding. You will bring an idea for a task for your lesson plan to class on October 14. The task should align with your practicum as you will be teaching it in your class. You will submit your Lesson Plan three weeks before the final version is due. **You must submit a draft, it is not optional.** I will give you feedback which you will use to re-write it. The expectation is that through these revisions you will have designed a professional quality lesson plan. The goal is to demonstrate an understanding of the pedagogy discussed in class and to make the mathematics meaningful for students. A rubric, template, and write-up examples will be posted on Sakai. Your lesson plan will be graded based on the Danielson Domains 1, and 4a.

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

## Summary of Requirements

Attend all class sessions: 28 points

Five discussion board posts: 15 points, due by end of course

Letter to parents: 15 points, due 9/30

Curriculum development project assessment: 15 points, due 10/28

Individual lesson plan: 50 points, draft due 11/11, final 12/2

Teaching Reflection (and video): 15 points, due 12/9

## Course Schedule by Week

(subject to change depending on weather, pacing, and student learning):

Class Date	Topic and Standards	Readings Due	Assignments Due
Week 1 September 2	Introduction, Problem Solving, Making Mathematics Meaningful (1.6, 1.7, 4.9)		
Week 2 September 9	Addition and Subtraction Strategies & Problem Types, Counting (1.8, 2.1, 4.1)	Sakai: Erlwanger Sakai: Skemp Sakai: Khan article CM: Introduction and Ch 1	
Week 3 September 16	Addition & Subtraction Student Strategies, Counting, Teacher Roles, Strategies for ELLs (1.4, 3.9, 4.5)	Sakai Friel Sakai: Schwerdtfeger ST: Introduction	
Week 4 September 23	Counting and Multi-digit Strategies, Evaluation of Teaching Resources (1.9, 2.6, 2.8, 5.3)	ELLs: Ch 2 CM: Ch 2 ST: CH1	
Week 5 September 30	Children's Multi-digit Strategies, Mathematical Tools and Technology (2.3, 4.4, 4.5)	ST: Ch 2 and 3 Sakai: Nathan CM: Ch 3	<b>Letter to parents due UPLOAD TO TEACHSCAPE</b>
Week 6 October 7	Algebraic Thinking & Relational Thinking, Questioning (1.5, 1.7, 2.1)	ST: Ch 5 ELLs: Ch 6 CM: Ch 6	

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	<b>Bring an idea for a task to class (you will use this for your individual lesson plan)</b>
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	<b>Curriculum development project assessment due</b>
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	<b>Individual Lesson Plan Draft Due</b>
Week 12 November 18	Fractions, Curricular Evaluation, Social Norms (1.1, 1.8, 4.8)	CM: Ch 7 ELLs: Ch 1	
<b>THERE IS NO CLASS ON NOV 25 – UNIVERSITY SCHEDULE IS THURSDAY</b>			
Week 13 December 2	Geometry, Using Technology and Tools (1.1, 1.2, 4.4)	Sakai: Taylor-Cox ELLs: Ch 7	<b>Last Day to turn in Individual Lesson Plans UPLOAD YOUR TEACHING VIDEO TO TEACHSCAPE BY 12/9</b>
Week 14 December 9	Data Analysis, Mathematizing Social Issues (1.4, 4.3, 4.9)		<b>Teaching Reflection Due UPLOAD TO TEACHSCAPE</b>