RHODE ISLAND COLLEGE
Feinstein School of Education and Human Development
Department of Elementary Education
Course Syllabus
Spring 2011

Course Number ELED 504-01

Course Title Mathematics in the Elementary School

Instructor Rainy Cotti
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Office Hours: M 8:00-9:00 am; T 2:30-3:30 pm; or by appointment

Course Location and Meeting Times

T 4:00-6:50pm HBS 215

COURSE INFORMATION

Catalog Description (2009-2011): The content and approach of modern mathematics programs are studied, with emphasis on current research and curriculum trends.

Extended Description: The course prepares candidates to teach mathematics to children in the elementary and middle schools. It focuses on the exploration of theories and methodologies related to modern mathematics programs whose goals are based on national standards and state grade level expectations for mathematics education. The emphasis in this course is on a cycle of active teaching, active learning, and ongoing assessment. Candidates will become acquainted with materials and models used in teaching mathematical concepts to all students, with emphasis on addressing cultural diversity and special populations. This course will also encourage the use of available technology in candidates' learning and teaching, and will require exploration of the vast resources available for getting and giving information.

Prerequisites: Graduate status and elementary school teaching experience, or consent of instructor. Offered fall and spring.

Relationship to the Professional Program: For candidates in the Master of Arts in Teaching program, this is one of the six methods courses required for initial teacher certification. It provides fundamental experience in mathematics pedagogy as described by the National Council of Teachers of Mathematics' (NCTM) Principles and Standards for School Mathematics, Professional Standards for Teaching Mathematics, and Assessment Standards for School Mathematics, and the Rhode Island Grade Level Expectations for mathematics. It also conforms with and prepares candidates to meet the goals and indicators of the Rhode Island Professional Teacher Standards.

Relationship to FSEHD Conceptual Framework: This course emphasizes the synthesis of the academic content of mathematics with mathematics pedagogy and technology into new knowledge of how diverse children learn mathematics and how that learning is facilitated and evaluated. This includes a focus on multicultural issues in mathematics education and the role the mathematics educator plays in preparing children to live in a global society. An overarching aspect of the course involves the development of the reflective practitioner as students learn and implement mathematical knowledge, skills, and understandings,

both in class and in their practicum experiences. The course requires meeting standards of professionalism delineated in the FSEHD's Conceptual Framework, NCTM's Professional Standards for Teaching Mathematics, and the Rhode Island Professional Teacher Standards.

COURSE TEXTS AND MATERIALS

Required Texts:

Burns, M. (2001). Teaching Arithmetic: Lessons for Introducing Multiplication, Grade 3. Sausalito, CA: Math Solutions Publications.

Ginsburg, H. Children's Arithmetic, 2nd ed. (1989). Texas: Pro-Ed, Inc. (no purchase-loaned by instructor)

Van de Walle, J.; Karp, K; & Bay-Williams, J. (2010). Elementary and Middle School Mathematics: Teaching Developmentally, 7th ed. Boston: Pearson Education, Inc. **(Special Rhode Island College edition)**

COURSE OUTCOMES

The objectives for this course are organized within the framework of the Standards for the Professional Development of Teachers of Mathematics (NCTM). During and after this course, teachers will be able to:

1. construct, teach, and reflect upon mathematics units/lessons that model developmentally appropriate practices consonant with the NCTM Standards, Rhode Island K-8 Mathematics Grade Level Expectations (GLEs), Conceptual Framework of the FSEHD, and the Rhode Island Professional Teacher Standards: ***RIPTS 1,2,3,4,5,6,7,8,9,10,11; ACEI 1, 2.3, 2.8, 3.1, 3.2, 3.3, 3.4, 3.5, 4, 5.1, 5.2, 5.4***
2. display content knowledge of mathematics through coursework and assessments, and through construction of units and practicum teaching: ***RIPTS 1,2; ACEI 1, 2.3***
3. describe the importance of positive mathematical attitudes to the teaching of mathematics: ***RIPTS 1, 7, 10, 11; ACEI 5.1, 5.2, 5.4***
4. explain and use varied methods of assessment that reflect both formative and summative evaluation, and use findings to plan/modify subsequent teaching: ***RIPTS 9; ACEI 4***
5. use technology appropriately in instructional planning and implementation of lessons, including the use of calculators, and the location and use of Internet resources: ***RIPTS 2,8; ACEI 1, 3.5***
6. describe relevant professional organizations and journals available for continued professional growth opportunities, and the importance of lifelong professional development in the teaching of mathematics: ***RIPTS 10; ACEI 5.1, 5.2***

Aspects of the Professional Standards for Teaching Mathematics embedded within the course outcomes include:

The Learning Environment
- Problem Solving/Thinking and Reasoning
- Manipulatives
- Technology
- Communication

Analysis of Teaching and Learning
- Assessment
- Evaluation
- Mathematical Power

Worthwhile Mathematical Tasks
- Child Development

Connections
Content
Primary
Intermediate
Classroom Discourse
Communication
Models of Teaching

COURSE REQUIREMENTS

Description	Conceptual Framework	RIPTS	ACEI Standards	Course Outcomes
Class Participation and Attendance (10%): This course has an underlying premise that candidates must construct their own knowledge and that working cooperatively fosters both intellectual and social development. It requires active participation in activities and discussions to optimize learning. Late work, tardiness to class, and unexcused absences all contribute to professionalism and will result in a lower grade.	Professionalism	7, 8, 10, 11	1, 2.3, 5.1, 5.2	1, 2, 3, 4, 5, 6
Ginsburg Response Paper (10%): Read and respond to the first four chapters in the Ginsburg book. This assignment consists of reflections about the Ginsburg reading and how you expect your teaching to be influenced by this reading. A separate sheet listing the details will be provided.	Knowledge	2, 3, 4	1, 2.3, 5.2,	1, 2, 3, 4
Action Research Assignment (15%): The Ginsburg book provides many examples of assessments used with children. You will select a minimum of two assessments that pique your interest and implement them with an appropriately aged child. You will write up the results, comparing them to the results described in the book. A separate sheet listing the details will be provided.	Plan-Act-Reflect Knowledge Pedagogy Diversity	9	4	4
Reading Analysis Assignment (10%): A sheet of critical questions associated with the reading of the Burns book will be given out and must be brought to class completed. The sheet will assist you in contributing to small group discussions about the structure and components of the unit described in the book. Papers will be collected and assessed.	Knowledge Pedagogy Diversity	2, 3, 4, 5, 8, 9	1, 2.3, 5.2	1, 2, 3, 4, 5
Research/Curriculum/Unit Project (40%): You will be required to complete a project in this course. The nature and scope of your project will be determined in consultation with the instructor and will be based upon your particular needs.	Plan-Act-Reflect Knowledge Pedagogy Diversity Professionalism	1, 2, 3, 4, 5, 7, 8, 9	1, 2.3, 2.8, 3.1, 3.2, 3.3, 3.4, 3.5, 4, 5.1, 5.2	1, 2, 3, 4, 5

Portfolio Artifact: Implemented Lesson Plan (15%): For MAT candidates: The FSEHD requires an Implemented Lesson Plan as part of your Preparing To Teach Portfolio/Admission to Student Teaching. One of the lessons from your unit will be used for this artifact. Further instructions will be provided. Or Research/Curriculum Presentation (15%): For students who are not MAT candidates, you will be asked to present your project to the class. Further instructions will be provided.	Plan-Act-Reflect Knowledge Pedagogy Diversity Professionalism	1, 2, 3, 4, 5, 7, 8, 9	1, 2.3, 2.8, 3.1, 3.2, 3.3, 3.4, 3.5, 4, 5.1, 5.2	1, 2, 3, 4, 5

COURSE SCHEDULE, TOPICS, AND ASSIGNMENTS

Topics that will be dealt with in the course include Number and Operations, Geometry, Algebra, Measurement, and Data Analysis and Probability. Each topic will be examined through the five process standards of NCTM's Principles and Standards for School Mathematics: Problem Solving; Reasoning and Proof; Communication; Connections; and Representation. The connections to the content and processes described in the Rhode Island Grade Level Expectations (GLEs) for Mathematics will also be a major focus of the course. Each topic will also be related to the professional standards for the teaching of mathematics that are listed after the topics.

#	Date	Topics and Associated Readings	Assignment Due
1	T 1/25	**Topics:** Introduction and Course Overview; Standards Guiding Instruction; Attitude Survey; Introductory Activities	Access Blackboard to view the syllabus and assignment instructions.
2	T 2/1	**Topics:** Introduction to Manipulatives and Children's Mathematical Development Begin reading Ginsburg: Chs. 1-4 Concepts in Babies; Little Children Learning to Count; Learning Practical Arithmetic; Children's Learning to prepare for assignment due next week	
3	T 2/8	**Topics:** NCTM Standards; New England Common Assessment Program (NECAP); Mathematics Objectives and Mathematics GLEs (grade level expectations); Mathematics Development in Early Childhood: Different Contexts for Teaching Mathematics	
4	T 2/15	**Topics:** How Children Learn Mathematics Van de Walle: Chs. 1,2 Teaching Mathematics in the Era of the NCTM Standards; Exploring What It Means To Do Mathematics	
5	T 2/22	**Topics:** Assessment Van de Walle: Chs. 4,5,6 Planning in the Problem-Based Classroom; Building Assessment into Instruction; Teaching Mathematics Equitably to All Children	**Ginsburg Response #1**
6	T 3/1	**Topics:** Number and Operations-Early Number Development; Number Sense	

		Ginsburg: Chs. 5-7 Learning About Symbols; Number Facts; Computing	
7	T 3/8	**Topics:** Number and Operations-Whole Number Concepts Van de Walle: Chs. 8,9,10 Developing Early Number Concepts and Number Sense; Developing Meanings for the Operations; Helping Children Master the Basic Facts	**Burns Reading Analysis Assignment**
	T 3/15	**Spring Break**	
8	T 3/22	**Topics:** Number and Operations-Place Value Van de Walle: Chs. 11,12,13 Whole Number Place-Value Development; Strategies for Whole-Number Computation; Using Computational Estimation with Whole Numbers	**Ginsburg Research Assignment**
9	T 3/29	**Topics:** Problem Solving Read entire Burns book: Teaching Arithmetic: Lessons for Introducing Multiplication, Grade 3 and thoughtfully answer the questions for the assignment due next week. This reading is designed to provide background regarding important components of mathematics units. Van de Walle: Ch. 3 Teaching Through Problem Solving	
10	T 4/5	**Topics:** Unit planning; Lesson Plan Structure; Writing Objectives; Word Walls; Math Journals	
11	T 4/12	**Topics:** Geometry Van de Walle: Chs. 19,20 Developing Measurement Concepts; Geometric Thinking and Geometric Concepts	**Research/Curriculum/Unit Project/Artifact**
12	T 4/19	**Topics:** Data Analysis and Probability-Graphing Van de Walle: Chs. 21,22 Developing Concepts of Data Analysis; Exploring Concepts of Probability	
13	T 4/26	**Topics:** Number and Operations-Fractions Van de Walle: Chs. 15,16,17 Developing Fraction Concepts; Developing Strategies for Fraction Computation; Developing Concepts of Decimals and Percents	**Research Presentations or Implemented Lesson Plans**
14	T 5/3	**Topics:** Algebra; Current Issues in Mathematics Education; Course Wrap-up Van de Walle: Ch. 14 Algebraic Thinking: Generalizations, Patterns, and Functions; Articles provided by instructor	**Research Presentations or Implemented Lesson Plans**

COURSE EVALUATION

Evaluation in this course will be concerned with your overall professional development in the teaching of mathematics. A major focus will be the attainment of a high level of growth in the course objectives. A variety of assessments will be used to evaluate progress, including class attendance and participation, a response paper, a research assignment, a reading analysis assignment, and a project. The percentages used to determine the final grade will be: Class Participation and Attendance-10%; Ginsburg Response Assignment-10%; Action Research Assignment-15%; Burns Reading Analysis Assignment-10%; Project-40%; Implemented Lesson Plan (MAT Artifact) or Research Presentation-15%.

Grading System:

93-100	=	A
90-92	=	A-
87-89	=	B+
83-86	=	B
80-82	=	B-
77-79	=	C+
73-76	=	C
70-72	=	C-
69 or below	=	F

REFERENCES

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Ashlock, R.B. (2002). Error patterns in computation, 8th ed. Columbus, Ohio: Charles E. Merrill Publishing Co.

Brooks, J.G. and Brooks, M.G. (1993). The Case for the Constructivist Classroom. Alexandra, VA: Association for Supervision and Curriculum Development.

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Cuisenaire Company of America. (1996). ...the Super Source: Snap Cubes, Gr. K-2. White Plains, NY: Cuisenaire Company of America, Inc.

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Irvine, J.J. and Armento, B.J., eds. (2001). Culturally Responsive Teaching: Lesson Planning for Elementary and Middle Grades. Boston: McGraw-Hill.

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Karp, K.; Brown, E.T.; Allen, L.; & Allen, C. (1998). Feisty Females: Inspiring Girls to Think Mathematically. Portsmouth, NH: Heinemann, Inc.

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Ma, L. (1999). Knowing and Teaching Elementary Mathematics. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

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Web site related to mathematics: Aviation and mathematics: http://www.planemath.com.

Web site related to mathematics: A Maths Dictionary for Kids by Jenny Eather: http://www.teachers.ash.org.au/jeather/maths/dictionary.html.

Other

Rhode Island College is committed to making reasonable efforts to assist individuals with documented disabilities. If you are seeking reasonable classroom accommodations under the Americans with Disabilities Act, and/or Section 504 of the Rehabilitation Act of 1973, you are required to register with the Student Life Office. The S.L.O. is located in Rm. 127 in Craig-Lee Hall. The phone number is 456-8061. To receive academic accommodations for this class, please obtain the proper S.L.O. forms and meet with me at the beginning of the semester.