

Course Syllabus
C&T 351: Mathematics in the Elementary Classroom
Fall 2019, 142 Joseph R. Pearson Hall
Tues 11 am – 12:15 pm and 3:30 pm – 4:45 pm
Thurs 8 am – 9:15 am and 12:30 pm – 1:45 pm
(blocked with C&T 347 and C&T 349)

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Office hours: Before or after class or by appointment

Course Description and Purpose: The purpose of this course is to explore how to help children learn mathematical concepts and skills with understanding. The emphasis will be on teaching children mathematics using an active learning and problem solving approach. We will examine theories and methodologies related to topics in elementary mathematics programs. We will analyze children's mathematical thinking through the lens of various learning theories. We will observe teaching and learning of mathematics and reflect on how teachers can help children make sense of mathematics. You will become familiar with materials and models used in teaching mathematical concepts to children. The field experience component of this course is designed to acquaint you with children and the classroom environment as related to mathematics education. This course will also explore the use of available technology in your learning and teaching.

Instructional Approach and Strategies: Active participation is a major component of this course. Cooperative learning strategies, formative assessment, and student reflection are used on a regular basis. This course has been designed in accordance with the philosophy set forth by the National Council of Teachers of Mathematics (NCTM) through the *Principles and Standards for School Mathematics* publication. The recommendations for mathematics education found in *Principles and Standards for School Mathematics* are based on the belief that all children "should learn important mathematical concepts and processes with understanding," (NCTM, 2000, p. ix). Learning experiences of the course are based on a constructivist view of learning in which the learner actively builds understanding through the refining of knowledge and skills based on experiences.

Use of Educational Technology in Course:

Course information, announcements, assignments, documents, required readings and grades will be posted to Blackboard, at <https://courseware.ku.edu/>. PowerPoint presentations and other online tools are used during the semester.

Readings: There is no required textbook for this class. Textbook materials will be made available in the classroom. Additional readings and resources will be posted to Blackboard.

Conceptual Framework for KU Teacher Education Program:



The primary mission of the School of Education is to prepare leaders in education and human services fields. As stated in the School Code:

Within the University, the School of Education serves Kansas, the nation, and the world by (1) preparing individuals to be leaders and practitioners in education and related human service fields, (2) expanding and deepening understanding of education as a fundamental human endeavor, and (3) helping society define and respond to its educational responsibilities and challenges.

The components that frame this mission for our initial and advanced programs are Research and Best Practice, Content Knowledge, and Professionalism. These interlocking themes build our Conceptual Framework.

C&T 351 emphasizes the interconnectedness of these three areas of the conceptual framework. Students are actively engaged as learners, which illustrates national recommendations for quality mathematics and science teaching. Students learn about best pedagogical practices through a series of readings, activities, and discussions. The goals and learning experiences of this course are designed to prepare teacher candidates who are developing educational practitioners and leaders as described in the mission of the University of Kansas, School of Education. Throughout the course we will be a community of learners that collectively reflects on mathematical content and pedagogical knowledge, research and best practice, and educational professionalism.

Statement about Diversity and Inclusivity: Diversity is an integral part of the University of Kansas School of Education's commitment to excellence. The faculty, staff, and students of the School of Education value inclusiveness and equal opportunity for diverse learners and an environment of mutual respect for all members of our community. We believe that all students benefit from training and experiences that will help them to learn, lead, and serve in an increasingly diverse society.

Course Objectives:

1. Develop confidence in teaching mathematics.
2. Demonstrate an understanding of the nature of mathematics.
3. Understand and apply theories of learning mathematics.
4. Identify aspects of mathematics that should be emphasized in the elementary grades.
5. Plan and teach mathematics lessons using instructional strategies that are developmentally appropriate for helping all students learn to understand and apply important mathematics concepts and procedures.
6. Investigate resources available for teachers of mathematics, including instructional materials, manipulative materials, multimedia, and human resources.
7. Explore and apply approaches to instruction and related assessment practices in mathematics that support the learning of important mathematics.
8. Conduct reflective reviews and participate in discussions regarding current research in mathematics.

Teacher Education Standards: This course helps the teacher candidate meet the following standard for elementary licensure in the state of Kansas.

KANSAS TEACHER EDUCATION AND LICENSURE STANDARDS: Early Childhood-Late Childhood (K-6)

Standard #2: The kindergarten through sixth grade teacher knows, understands, and uses the major concepts, procedures, and reasoning processes of mathematics that define numbers and operations, geometry, measurement, data analysis and probability, and algebra so that all students understand relationships that can represent phenomena, solve problems, and manage data.

Knowledge

1. The teacher knows and understands the mathematical concepts of number sense, number systems and their properties, computation, geometric figures and their properties, transformational geometry, measurement, data analysis, data representations, probability, patterns, functions, and representations of algebraic and geometric situations/solutions.
2. The teacher understands the five process standards (problem solving, reasoning and proof, communication, connections and representations).
3. The teacher is aware of effective, developmentally appropriate instructional strategies to help all students learn and use their mathematical skills in many different situations and applications to solve real life problems.
4. The teacher knows a variety of developmentally appropriate assessment tools that align with curriculum and instruction.

Performance

1. Appropriate to students' age and development, the teacher can use and apply, demonstrate, and teach the concepts of number sense, number systems and their properties, computation, geometric figures and their properties, transformational geometry, measurement, data analysis, data representations, probability, patterns, functions, representations of algebraic and geometric situations/solutions.
2. The teacher integrates the five process standards (problem solving, reasoning and proof, communication, connections and representations) into math instruction.
3. The teacher demonstrates the ability to use effective, developmentally appropriate instructional strategies to help all students learn and use their mathematical skills in many different situations and applications to solve real life problems.
4. The teacher uses diverse and developmentally appropriate assessments that align with curriculum and instruction.

Course Requirements (300 points possible):

Participation in class and field work – Attendance and participation is expected and is an indicator of your dedication to the profession of teaching. Full participation during field work is required. Hours missed will need to be made up. Professional behavior and professional language are expected at all times. This includes being prompt and prepared for each class and each teaching event. **Note:** *If an absence is necessary for a field experience it is critical that you notify me, the school to which you are assigned, your teaching partner, and the classroom teacher.*

Written Assignments and Presentations (105 points) –

- Math Life Story – You will write a math autobiography. This assignment is worth 15 points.
- Number Talks – You will share an idea for using Number Talks in the Elementary classroom. You will present your Number Talk to our class. This assignment is worth 25 points.
- Using Games – You will share an idea for a game. You will present your ideas to our class. This assignment is worth 25 points.
- Diversity Project – You will read literature about teaching all students. You will prepare a presentation and share your work with our class. This assignment is worth 40 points.

Field Work Assignments (95 points) –

- Journals – You will complete 2 journal entries while you are in the elementary classroom. Each journal is worth 15 points.
- Lesson Plans – You will work with a partner to develop 2 mathematics lesson plans for implementation in your field experience classroom. Each lesson plan is worth 25 points.
- Analysis of Teaching – You will work with your teaching partner to develop and teach mathematics lessons in your field experience classroom. You will reflect on the experience, analyze your teaching, and present the results to our class. This presentation is worth 15 points.

Final Project: Portfolio of Lesson Ideas (100 points) –

You will develop a portfolio of standards-based mathematics activities you could use in an elementary classroom. You will write and include your teaching philosophy.

Assignments and Grading Policy:

Grading Scale: 90 – 100% A; 80 – 89% B; etc. *Plus and Minus grades will be assigned.*

	Points	Due Date
Math Life Story	15	Tues., 9/3
Presentation – Game and materials	25	Tues., 9/10
Presentation – Number Talk	25	Tues., 9/17
Journal 1	15	Fri., 10/11
Lesson Plan 1 – Final Draft	25	Fri., 10/25
Journal 2	15	Fri., 11/15
Presentation – Diversity Project	40	Thurs., 11/21
Lesson Plan 2 – Final Draft	25	Fri., 12/6
Presentation – Analysis of Teaching	15	Tues., 12/10 or Thurs., 12/12
Final Project	100	Fri., 12/20

Assignments must be submitted by the due date. Generally, late work is not accepted. In certain situations, with a legitimate excuse, and with previous permission, assignments can be submitted after the due date but points may still be deducted.

University Policies:

Students with Disabilities: The KU Office of Disability Resources (DR) coordinates accommodations and services for all eligible students with disabilities. If you have a disability and wish to request accommodations please contact DR as soon as possible (22 Strong Hall; 864-2620 (V/TTY). Information about their services can be found at <http://www.disability.ku.edu/>. Please also contact me in regard to your needs in this course.

KU Policy on Scholastic Dishonesty: Students who violate university rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course. Since such dishonesty harms the individuals, all students, and the integrity of The University, policies on scholastic dishonesty will be strictly enforced.

<http://www.studenthandbook.ku.edu/codes.shtml#Academic%20Misconduct>

Course Schedule:

	Topics/Activities	Assignments
Week 1		
Tues. 8/27	Course Overview; Standards – NCTM, Common Core	
Thurs. 8/29	Number Sense; Computation & Estimation; Place Value Concepts	
Week 2		
Tues. 9/3	Developing Algebraic Thinking	DUE: Math Life Story
Thurs. 9/5	Data Analysis & Probability; Work on Game Presentations	
Week 3		
Tues. 9/10	Sharing Mathematical Games	DUE: Game presentation & materials
Thurs. 9/12	Work on Number Talks	
Week 4		
Tues. 9/17	Sharing Number Talks	DUE: Number Talk presentation
Thurs. 9/19	Geometry & Measurement; Preparing for field experience	
Week 5		
Tues. 9/24 & Thurs. 9/26	<i>Field Experience</i>	
Week 6		
Tues. 10/1 & Thurs. 10/3	<i>Field Experience</i>	
Week 7		
Tues. 10/8	<i>Field Experience</i>	
Thurs. 10/10	Field Experience conferences	<i>Journal 1: DUE Friday, 10/11</i>
Week 8		
Tues. 10/15	<i>Fall Break, no class or practicum</i>	
Thurs. 10/17	Field Experience conferences	
Week 9		
Tues. 10/22 & Thurs. 10/24	Lesson planning; Work on Diversity Project	DUE: Final draft of lesson plan 1
Week 10		
Tues. 10/29 & Thurs. 10/31	<i>Field Experience</i>	
Week 11		
Tues. 11/5 & Thurs. 11/7	<i>Field Experience</i>	
Week 12		
Tues. 11/12 & Thurs. 11/14	<i>Field Experience</i>	<i>Journal 2: DUE Friday, 11/15</i>

Week 13		
Tues. 11/19	<i>Field Experience</i>	
Thurs. 11/21	Sharing Diversity Projects	DUE: Diversity Project Presentation and materials
Week 14		
Tues. 11/26	Work on Assignments	
Thurs. 11/28	<i>Thanksgiving, no class or practicum</i>	
Week 15		
Tues. 12/3 & Thurs. 12/5	Field Experience conferences	DUE: Final draft of lesson plan 2
Week 16		
Tues. 12/10 & Thurs. 12/12	Presentations	DUE: Teaching Analysis Presentation

Final Project (Portfolio) - DUE: Friday, 12/20/19
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