EDIS 5320/5060: Mathematics in the Elementary School
Spring 2015

3 Credit Hours
Department of Curriculum, Instruction & Special Education
Prerequisites: Admission to Special Education or Elementary Education Teacher
Education Program; or instructor permission
Mondays &Wednesdays 2:00 – 3:15
Final Exam: TBA

Instructors

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Description
EDIS 5320/5060: Designed to teach elementary pre-service teachers the Virginia
Mathematics Standards of Learning content strands: Number and Number Sense;
Computation and Estimation; Measurement; Geometry; Probability and Statistics;
Patterns, Functions, and Algebra. This course also focuses on the processes for planning,
instructing, and assessing mathematics understanding – Problem solving, reasoning, and
proof, mathematical communication, mathematical connections, and representation.
Restricted to special education and elementary education.

Learning Objectives
Following the completion of EDIS 5320/5060, the prospective teacher of mathematics will be able to:
- understand the nature and structure of the mathematics content taught in elementary grades to help students develop mathematical understandings and proficiencies;
- utilize methods, ideas, and materials in mathematics to help students develop mathematical understanding;
- demonstrate an understanding of the national and state standards for school mathematics;
- design and implement mathematics lessons and tasks;
- use multiple pedagogical strategies for mathematics instruction;
- demonstrate knowledge of learning theories and human development in the teaching of mathematics;
- use assessment tools, strategies, and techniques to assess students' learning of mathematics;
- modify and adapt mathematics tasks and lessons for special education students, English Language Learners, and students with varying dispositions and motivations.
- use technology for planning and implementing mathematics lessons and tasks.

Instructional Methods
Following a theory into practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote students' development of attitudes, behaviors, and concepts in mathematics in support of the National Council of Teachers of Mathematics (NCTM), Common Core State Standards for Mathematics (CCSSM), and the Virginia Mathematics Standards of Learning (SOL).

Doing and Learning Mathematics
In this course, we will explore the National Council of Teachers of Mathematics' Process Standards and the Common Core State Standards for Mathematical Practice. The process of teaching mathematics to elementary and special education students is complex.

The differences in the students' experiences and learning preferences make the selection of teaching methods challenging. Before examining the details of effective teaching, we must first consider what it means to "do," and "learn" mathematics.

The Mathematics Curriculum
In this course, we examine the role of national and state curricula models. We will explore the National Council of Teachers of Mathematics' Content Standards, the Common Core State Standards for Mathematics' content standards, and the Virginia Mathematics Standards of Learning (SOL) content strands.

Decisions about the mathematics curriculum are not easy to make. It is difficult to reach universal agreement on the mathematics that every student should learn. Fortunately, curricular models exist at the national and state levels. These models provide direction for curriculum planners and teachers.

Teaching Mathematics

In this course, we will develop a framework for mathematics instructional quality with consideration of the various components of an effective mathematical learning environment.

Teachers make decisions regarding the quality of mathematics instruction. Teachers consider the several dimensions about instructional quality: multiple representations, connections and applications, mathematical tools, tasks that improve cognitive depth, mathematical discourse (explanation and justification), problem solving, and mathematical accuracy.

Assessment in Mathematics

In this course, we will examine the link between instruction and assessment. We will explore informal and formal assessment strategies; and explore common errors made by students.

When making curricular and instructional decisions, teachers must assess whether students are learning the stated objectives or outcomes. Assessment strategies must capture the full range of student abilities and dispositions towards mathematics.

Course Texts & Materials

Required Text

Van de Wall, J. A., Karp, K. S., & Bay-Williams, J. M. (2013). *Elementary and middle school mathematics: Teaching developmentally.* Boston: Pearson. Eighth edition.

Materials

These materials can be "borrowed" from Professor Berry for the semester. Or, students can purchase these materials on their own.

·   Base-ten blocks
·   Color Tiles
·   Cuisenaire Rods
·   Pattern Blocks

Course Requirements

Weekly Assignment Sheets & Attendance

Weekly assignment sheets will be posted on Collab. Typically, there are five parts to the weekly assignment sheets: (1) readings (2) reflect and discuss; (3) textbook questions for the mid-term and/or final exam(s); (4) participation/homework; and (5) video analysis. Readings, Participation/homework and video analysis will be discussed in class. This counts as 10% of your final grade. Members of the class bring a rich diversity of backgrounds, interests, and experiences to this course. A part of teaching is listening to other's ideas, questioning them, and sharing your ideas. All assignments are required to receive a final grade for this course. Attendance is mandatory. **Students with 15% unexcused absences will fail this course; please email if you are sick or have an emergency and will be unable to attend class.**

Annotated Bibliography

You will write an annotated bibliography. You annotated bibliography must include six articles focusing on a mathematics content area. The bibliography should focus on teaching articles. This is worth 10% of your final grade. **Due Date: February 4, 2015**

Manipulatives Lesson & Peer Teaching

You will develop a lesson using an assigned manipulative based on the content from your annotated bibliography. You should "script" your lesson so another teacher could teach the lesson in a similar manner. This lesson is worth **15%** of your final grade. **Due Dates: Draft 1 February 25, 2015; Final Draft April 15th ; Peer Teaching April 27, 2015**

Mid-Term Examination

The written examination will focus on readings, classroom discussion, lectures, and weekly questions/activities. The exam is worth **15%** of your final grade. **Due Date: March 4, 2015**

Tasks Library

Throughout the semester, you will collect 5 high cognitively demanding mathematical tasks from a variety of sources that can be used in your future classroom. You will also develop one rubric aligned with NCTM process standards that can be used most of the tasks. This assignment is worth **15%** of your final grade. **Due Date: March 25, 2015**

Mathematics Game

You will create and field test an original, interactive mathematics game that require children to think and reason mathematically. This is worth **10%** of your final grade. **Due Date: April 22, 2015**

Manipulative Examination

This examination requires students to use manipulatives to demonstrate and model mathematics concepts for elementary grades. This will be a one-on-one interview with the instructors. This is worth **15%** of your final grade. **Due Dates: TBA**

Final Examination
The written examination will focus on readings, classroom discussion, lectures, and weekly questions/activities. This is worth **10%** of your final grade. **Due Dates: TBA**

Course Evaluation and Grading
Through this course, you are learning a set of skills that you will use in your teaching career, and this has a direct impact on the grading policy. You must complete all parts of each assignment to receive a grade. Failure to complete an assignment can result in an incomplete or a failing grade for the course. Late assignments will not be accepted.

Course Grade Thresholds	
Grade	**Minimum %**
A+	100
A	95
A-	90
B+	87
B	83
B-	80
C+	77
C	73
C-	70
F	0

University Email Policy
Students are expected to activate and then check their official University of Virginia email address on a frequent and consistent basis to remain informed of University communications, as certain communications may be time sensitive. Students who fail to check their email on a regular basis are responsible for any resulting consequences.

University of Virginia Honor System
All work should be pledged in the spirit of the Honor System of the University of Virginia. The instructor will indicate which assignments and activities are to be done individually and which permit collaboration. The following pledge should be written out at the end of all quizzes, examinations, individual assignments and papers: "I pledge that I have neither given nor received help on this examination (quiz, assignment, etc.)". The student must sign the pledge. For more information, please visit http://www.virginia.edu/honor/.

Special Needs

It is the policy of the University of Virginia to accommodate students with disabilities in accordance with federal and state laws. Any student with a disability who needs accommodation (e.g., in arrangements for seating, extended time for examinations, or note taking, etc.), should contact the Student Disability Access Center (SDAC) and provide them with appropriate medical or psychological documentation of his/her condition. Once accommodations are approved, it is the student's responsibility to follow up with the instructor about logistics and implementation of accommodations.

If students have difficulty accessing any part of the course materials or activities for this class, they should contact the instructor immediately. Accommodations for test taking should be arranged at least 14 business days in advance of the date of the test(s). Students with disabilities are encouraged to contact the SDAC: 434-243-5180/Voice, 434-465-6579/Video Phone, 434-243-5188/Fax. For more information, visit the SDAC website at http://www.virginia.edu/studenthealth/sdac/sdac.html.

Course Outline
This class meets on Mondays and Wednesdays. This overview of topics is a tentative schedule and is subject to change at the instructors' discretion.

Dates	Topics	Textbook Chapters & Readings
Week 1 1/12 & 1/14	Syllabus	• VA SOL • Common Core • NCTM Overview
Week 2 1/21	VA SOL NCTM Standards Common Core	Chapter 1
Week 3 1/26 & 1/28	Learning Theory Cognitive Demand	Chapter 2
Week 4 2/2 & 2/4	Teaching Problem Solving & Counting	Chapter 3, 4, & 8
Week 5 2/9 & 2/11	Counting Number Talk	Chapter 8
Week 6 2/16 & 2/18	Number Talk Place Value	Chapter 8
Week 7 2/23 & 2/25	Adding/Subtract Structure & Basic Facts	Chapter 9 & 10
Week 8 3/2 & 3/4	Multiple/Divide Structure & Basic Facts	Chapter 6, 8, & 10
Week 9 3/16 & 3/18	Whole Number Computations Algorithms	Chapter 12 & 13
Week 10 3/23 & 3/25	Fractions Concepts	Chapter 15
Week 11 3/30 & 4/1	Fractions & Decimal Operations Algorithms	Chapter 16 & 17
Week 12 4/6 & 4/8	Patterns, Symbols, and Equations	Chapter 14
Week 13 4/13 & 4/15	Geometry	Chapter 20
Week 14 4/20 & 4/22	Measurement	Chapter 19
Week 15 4/27	Review	Review