## Syllabus

**EDU 314: Methods of Elementary Mathematics**

**November 26- December 19, 2018**

Anne Spencer

Office: 112 College Hall

Phone: 319-321-1218

Email: aspencer@cornellcollege.edu

Office hours: By appointment, or before or after class. Contact me after class, by phone or by email

**Class Meeting Place and Times**

Generally this class will meet from **9:00-12:00 in 303 College Hall .** The second week of class (Tuesday through Monday) you will participate as a practicum student in an elementary classroom for the full school day (Dec.4-7 and Dec 10). We will schedule regular meetings during this practicum to discuss observations and assignments. You will teach a small group math lesson that I will observe sometime during the week. You will receive information about your classroom assignment the week or so before Block 4.

Required Texts (for both EDU 314 and INT 310):

Burns, Marilyn. (2015). *About Teaching Mathematics*. Sausalito, CA: Math Solutions.

Sousa, D. (2008). *How the Brain Learns Mathematics.* Thousand Oaks, CA: Corwin Press

Richardson, K. (2012). *How children learn number concepts: A guide to the critical learning phases.* Bellingham, WA: Math Perspectives.

\*\*\*Selected articles/chapters on Moodle

***For this class, you will be required to use a notebook to hand-write observations, responses and reflections instead of a computer. Please bring one to the first day of class.***

Online Resources:

* Iowa Common Core <https://iowacore.gov/iowa-core/subject/mathematics>
* National Council of Teachers of Mathematics: www.nctm.org

Course Overview

The goal of this course is to examine and practice an investigative approach to elementary mathematics pedagogy, which is purposeful, inquiry-based, child-centered, developmentally appropriate, guided by formative assessment, and meaningful for all learners. Additionally, this course will offer experiences in developing targeted instruction in mathematics based on an in-depth study of a child learning mathematics, an investigation of instructional conversations in the teaching of mathematics, and opportunities to develop and experience elementary mathematics lessons using problem solving experiences, published curriculum, professional resources, and relevant technology.

Mathematical Power

The National Council of Teachers of Mathematics (NCTM) has called for fostering the mathematical power of ALL learners. In its most recent articulation of Principles and Standards for School Mathematics (2000), NCTM reinforced this call with a clear vision for school mathematics. Mathematical power involves:

* A positive disposition toward mathematics (e.g., the interest and confidence to learn and to use mathematics),
* The skills to conduct mathematical inquiry (e.g., problem solving and reasoning skills), and
* Understanding (well-connected knowledge).

This course, then, considers how K-6 instruction can foster each of these components of mathematical power via NCTM, the Common Core Student Standards, and the Iowa Core. In this course, we will move beyond procedural understanding of mathematical concepts and, instead, will focus on choosing worthwhile mathematical tasks that engage children’s curiosity, involve them in the processes of mathematical inquiry, and prompt them to develop a conceptual understanding of mathematical content.

Course Objectives

Upon successful completion EDU: 314, you will demonstrate through class discussions, presentations, assignments, and experiences the ability to:

* Understand the content, methods, and materials necessary to teach elementary mathematics. Cornell College *Educational Priorities and Outcomes: Knowledge, Inquiry, Reasoning, Communication, Vocation; InTASC standard #4*
* Examine, illustrate, and demonstrate various approaches to teaching elementary mathematics. *Cornell Educational Priorities and Outcomes: Knowledge, Inquiry, Reasoning, Communication, Intercultural Literacy, Vocation; InTASC standard #8*
* Understand how to employ informal ongoing assessments (formative) to better understand students’ mathematical thinking and how this informs future instructional decisions. *Cornell College Educational Priorities and Outcomes: Knowledge, Inquiry, Reasoning, Communication, Intercultural Literacy, Ethical Behavior, Vocation; InTASC standard #6*
* Make connections to the Iowa Core and NCTM Standards when planning lessons. *Cornell College Educational Priorities and Outcomes: Knowledge, Inquiry, Vocation; InTASC standard #7*
* Develop mathematics lessons to meet the needs of diverse learners through differentiated approaches to instruction. *Cornell College Educational Priorities and Outcomes: Knowledge, Inquiry, Reasoning, Intercultural Literacy, Ethical Behavior, Vocation; InTASC standards #2 and #7*
* Develop mathematics lessons with rich content, well-developed objectives, logical procedures, formative assessment and teacher reflection. *Cornell Educational Priorities and Outcomes: Knowledge, Inquiry, Reasoning, Intercultural Literacy, Vocation; InTASC standard #4, #6, #7, and #10*
* Examine the critical role of teacher language (questioning strategies) in the teaching of mathematics in order to foster mathematical instructional conversations that lead to deeper understanding for students. *Cornell College Educational Priorities and Outcomes: Knowledge, Inquiry, Reasoning, Communication, Intercultural Literacy, Vocation; InTASC standards #3, #5, and #8*
* Examine the critical role of student language in the learning of mathematics and in the assessment of what children understand about the mathematics they are learning. Specifically this means to invite, listen to and respect the mathematical thinking of all students, even when it is difficult to understand or it is not the “answer” you are seeking. *Cornell Educational Priorities and Outcomes: Knowledge, Inquiry, Reasoning, Communication, Intercultural Literacy, Ethical Behavior, Citizenship, Vocation; InTASC standards #1, #2, and #6*
* Become a scholarly and reflective practitioner as you critically examine perspectives on curriculum, instruction, assessment and differentiation as it relates to learner development, incorporate professional terminology into your spoken and written discourse, and articulate a complex understanding and philosophy of teaching mathematics in the elementary classroom; *Cornell College Educational Priorities and Outcomes: Knowledge, Inquiry, Reasoning, Communication, Intercultural Literacy, Vocation, Well-Being; InTASC standards #1, #4, #5, and #7*
* Successfully complete your practicum experience in a public school elementary classroom, 15+ hours; Cornell College Educational Priorities and Outcomes: Knowledge, Inquiry, Reasoning, Communication, Intercultural Literacy, Ethical Behavior, Citizenship, Vocation, Well-Being

\*This course supports the Educational Priorities and Outcomes of Cornell College as noted following each objective.

### OTHER HELPFUL INFORMATION

Documented Disabilities and Accommodations

Cornell College makes reasonable accommodations for persons with disabilities.  Students should notify the Coordinator of Academic Support and Advising and their course instructor of any disability related accommodations within the first three days of the term for which the accommodations are required, due to the fast pace of the block format.  For more information on the documentation required to establish the need for accommodations and the process of requesting the accommodations, see <http://www.cornellcollege.edu/academic-support-and-advising/disabilities/index.shtml>.

Academic Honesty

Part of your professionalism is your academic honesty. If you use a classmate’s or an author’s ideas or words in your own written work (including online sources), you must provide a citation through an appropriate APA reference.

Cornell College expects all members of the Cornell community to act with academic integrity. An important aspect of academic integrity is respecting the work of others. A student is expected to explicitly acknowledge ideas, claims, observations, or data of others, unless generally known. When a piece of work is submitted for credit, a student is asserting that the submission is her or his work unless there is a citation of a specific source. If there is no appropriate acknowledgement of sources, whether intended or not, this may constitute a violation of the College’s requirement for honesty in academic work and may be treated as a case of academic dishonesty. The procedures regarding how the College deals with cases of academic dishonesty appear in The Catalogue, under the heading “Academic Honesty.

Note: Plagiarism can result in an F for the assignment and denial of admission to the Teacher Preparation Program. For students already admitted, academic dishonesty is in violation of the teaching dispositions expected by our department and can result in removal from the program.

Diversity

My intention is that students from diverse backgrounds and perspectives be well served by this course and that students’ diversity be viewed as a resource and benefit to our collective learning. I also intend that diversity of K-8 students and notions of sociopolitical equality are central issues in the course. There are times when we will disagree, but we will not intentionally humiliate, intimidate, or embarrass each other, but rather listen to and entertain perspectives that differ from our own. Please remember that I am always interested in making the course a safe place for everyone to learn and grow. Please do not hesitate to set up a time to meet with me after class if you have concerns.

Helpful references

Cornell College, Education Department Handbook, online.

**Writing Studio:** The Writing Studio is housed on the first floor of Cole Library. Please familiarize yourself with this wonderful service provided by the Center for Teaching and Learning. Professional writing teachers and peer tutors will support you in aspects of your writing process by providing consultation and feedback at various stages of your draft. Appointments can be scheduled by phone (x4462) or walk-ins accepted during regular hours.

### OVERVIEW OF EXPECTATIONS

This is a professional development course and the following expectations are consistent with what is expected of practicing teachers:

* Attendance and punctuality, as well as preparation and professionalism are key to your success in this course, but alone do not constitute an A.
* All assignments are to be completed on time (see specific deadlines listed on course calendar).
* Bring course texts with you to class each day in order to participate fully in our discussions.
* Maintain a professional demeanor in the college classroom and the public school classroom. Be mindful of what you say and do, how you represent yourself and Cornell College, and your developing sense of yourself as a teacher. The sooner you begin to take on a scholarly and professional identity in teaching, the more likely you will adopt the behaviors and practices most beneficial to you and your future students and most appreciated by school administrators. This includes wearing clothing appropriate for a pre-service teacher (no pj’s please!) and eating before or after class or during our midmorning break. (Coffee or a drink in class is fine.)
* As mentioned in the materials section, you will be required to use a notebook to hand-write observations, questions, responses and reflections instead of a computer. Bring this to class each day.
* Computers will occasionally be used for referring to documents online or accessing resources for course purposes. Your computer screen should be closed if you are not required to use it.
* Cell phones should be turned off or silenced and put away for class time. You will be given time during class breaks only to record course-related times and dates.

### ATTENDANCE, PREPAREDNESS, ACTIVE PARTICIPATION AND PROFESSIONALISM

Your daily attendance, punctuality, preparation, and participation are course requirements. In-class discussion, demonstrations and collaborative activities are central vehicles for student learning and they can't be made up or compensated for by borrowing notes or working independently when you miss class.

Attendance and Punctuality

If you absolutely must miss class, email me before class. Take responsibility for finding out from classmates what you missed and for making an appointment with me if you have further questions. Attendance and punctuality will be taken into account in the grading process even when absences are for very good reasons. The exception is if you are on a sports team or other extracurricular events that take you away from class. In that case, please let me know in advance. Because we will cover a lot of territory in every class session it is important that you arrive and are ready to begin on time. More than one absence will lower your grade by one step (e.g., B to B-). Please don’t ask if it’s “all right” for you to miss class. You have to make that decision yourself.

Preparation

Complete reading assignments before the start of the class day during which they will be discussed. Bring assigned reading and responses to class daily. Be ready to talk and write about how course concepts and classroom applications relate to what you’ve read.

Active Participation

Active participation includes actively listening to and making relevant contributions to discussions of course topics. Contributing daily to large and small group discussions is a course requirement. Appropriate participation means sticking with the topic, listening to and building upon points brought up by other group members, referring specifically to course readings in your contributions (you should always have course readings with you in class), adjusting the amount you talk so everyone has a chance to contribute meaningfully, and helping to sustain relevant conversation for the allotted time. Teaching is scholarly work! It is your responsibility to bring questions and insights you have from the assignments to class each day so we can engage in a professional dialogue.

Professionalism

Please be conscious of how you talk and write about teachers, children and ideas. Confidentiality is essential in discussing schools, classrooms, teachers and children. It is unprofessional and unethical to make unsubstantiated statements about children, families, and teachers. It is important also to critique and express disagreement with ideas and practices in constructive ways that respect opposing opinions. A classroom community where risk-taking is valued involves the respect of all participants. I expect you to practice using professional vocabulary and terminology introduced in the course text and discussions as you grow in your scholarly identity as an elementary school teacher.

Professor Preview of Assignment

I will not preview finished assignments. However, if/when you have any questions regarding the assignments, class readings, or how your work will be assessed please ask them in class. I prefer to answer all questions in class so that all may benefit. It is your responsibility to ask questions and to access relevant resources to clarify confusion as needed. Note that all assignments in this course have a rubric, which will guide your thinking as you work through each assignment. I expect assignments to be turned in according to the deadlines on the calendar. The pacing of assignments is intended to allow you to build on your learning each week. I will not accept late assignments unless arrangements have been made ahead of time and I consider your request to be reasonable.

Grade Concerns

If you have questions about the grade you receive for any assignment, provide a written appeal within 2 days after an assignment has been returned to you in which you clearly articulate and support the strengths and weaknesses of your paper, using a professional tone.

Upon receiving your appeal, we will make an appointment to discuss your points in detail.

Grading Procedures

I will respond to each assignment. I will expect you to consider and apply my written and verbal feedback as you learn and grow in the course. I will ask you to self-evaluate your own work and to engage in a peer review workshop format in class as appropriate.

Grading Scale:

327-350 A

315-326 A-

303-314 B+

289-302 B

279-288 B-

268-278 C+

253-267 C

244-252 C-

233-243 D+

219-232 D

209-218 D-

208 or below

### Overview of Assignments (see specific assignment documents for detailed descriptions)

Journaling Notebook and Field Notes: (25 points total)

Beginning on the first day of class, you will use a Journaling Notebook to record responses to your daily reading assignments. Responses must be specific to the readings as you reflect on ideas, situations, strategies or problems from the text, connect to other readings, experiences or class discussions and solve problems posed by the authors. Your reflections will be your resource for contributing to class discussions as well as a reference for assignments and projects. Evidence that you used these entries when responding to your peers’ ideas in class and as a resource when completing class projects will be considered in the final participation grade.

A section in your notebook will be used for Field Notes, a daily record of your practicum experience. Field Notes are a record of observations, anecdotes, questions and reactions related to what happens in the classroom. A great deal of the processing of your week in a classroom depends on close observation, data collection, assessment, and data analysis. Thorough field notes based on observations of your child study participant engaging in mathematics are essential for completing your required child study project. Limited or insufficient data collection will result in the inability to successfully meet the requirements of this and other assignments.

Field Notes will be discussed in class prior to your school practicum week.

Problem Solving Lesson: (25 points)

To provide experience with planning and teaching lessons, you will be responsible for leading a problem solving activity with your classmates. This will involve writing a lesson plan using the required format in preparation for teaching the lesson as well as reflecting in writing following each lesson. The lesson plan and reflection will be turned in after you teach.

Class Participation Grade Assignment (25 points)

You will self-evaluate your class participation using the self-evaluation criteria on the class participation rubric, the dispositions handout from the Education Department, and the additional expectations listed below. Note: This is not an easy 25 points! My expectations for your participation in class are extremely high (regular attendance and minimally meeting these expectations does not constitute an A).

An “A” participation grade is an exemplary distinction that conveys exceptional effort, intellectual curiosity, enthusiasm for learning, willingness to be challenged, reflective teaching and learning, respect for classmates, instructors, new ideas, and authoritative resources, a commitment and high regard for the teaching dispositions of the department, and professionalism both in the college classroom and the elementary school classroom. I will consider the points in your self-evaluation in my final determination of your class participation grade alongside my observations, the evaluation from your mentor teacher and the quality of your participation throughout the block.

Practicum/Evaluation by Mentor Teacher (15+ hours)

This aspect of the course is pass/fail and is considered part of your participation grade.

In order to receive a grade in the course you must complete the 15+ hours in the school successfully. Daily attendance, promptness, professionalism, preparedness, enthusiasm and reflection are all key ingredients to your success during this week. Each individual placement will vary in what you are asked to assist with in the classroom to which you are assigned. Be prepared to participate as well as observe throughout the week!

**There are specific responsibilities related to course content required of you during this week.** You will complete a small group math lesson with the required math instructional materials your mentor teacher uses during your week in the schools. You will also observe, complete an interview of a student and gather the data necessary for the required MTSS Project. On your first day in the school, please ask your cooperating teacher when you can schedule time for these. You will need to audio or video tape both of these tasks, so locate the equipment needed ASAP. Also, let me know when you will teach your lesson so I can observe.

Small Group Lesson (25 points)

Teach one small group math lesson as determined with your mentor teacher. This may or may not be based on materials used in the classroom but you will write a lesson plan in your own words to hand in to your teacher the day before you teach. (Turn in a copy to me to be graded.) Be sure to include the Iowa Common Core standards addressed. Teaching this lesson is an expectation of fulfilling the practicum experience as well as the lesson you will audiotape for your Instructional Conversation Analysis (don’t forget, or you will need to teach an additional lesson!).

Instructional Conversation Analysis (100 points)

This assignment requires you to transcribe and analyze three “talking points” in your lesson, by reflecting on the effectiveness of your instructional conversation with students. You will focus on elements of structure, function, and content and how dialogue facilitated the goals of your lesson.

Child Study Records/Outline of Findings & Interview Protocol – (50 points -due w/MTSS Overview)

A summary of the information you gathered from school resources during your practicum and the Interview you conducted with your student will be turned in along with the MTSS plan. Consider this the evidence on which you base your Learning Goal and Instructional Plans.

MTSS Math Learning Goal and Instructional Overview (3-4 week plan)- 50 points

Presentation & Handout

This is a simulation of the Child Study/MTSS process used in schools to plan for the support of a student in need. You will prepare a presentation for a committee of your professional peers (in this case, your classmates) to provide the evidence mentioned above and the proposed plan, including an overview of the progression of lessons, for addressing the student’s needs. One of the lessons will be taught to your classmates.

Hard copies outlining your findings and proposal will be provided for the MTSS committee (your peers and me) in class.

Teaching Mathematics with Technology Lesson – 50 points

Using research based, authoritative and professional online resources, you will write and teach an engaging mathematics lesson that relies on technology. This may involve websites, online manipulatives, computer generated graphics or simulations, etc.

\*\*See assignment handouts for detailed descriptions and rubrics for evaluation criteria (in-class and on Moodle)