## Syllabus

**INT 310: Theoretical Foundations of Elementary School Mathematics**

**Block 3: October 22 –November 14, 2018**

**College Hall Room 102**

Anne Spencer, MA

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REQUIRED TEXTS (for both INT310 and EDU314)

Burns, M. (2015). *About teaching mathematics: A K-8 resource* (4th ed.). 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.

\*\*Select journal articles on Moodle

SCHEDULE

Generallythis class will meet 9:00 to 12:00 or 9:00-11:00 if afternoon workshop times are scheduled (1:00-2:00). Thursday of the 1st week is a scheduled practicum day. See *Student Plans* for details.

**Office hours:**

MWF after class or happily by appointment.

You may contact me directly after each class or by phone or email listed on this document (I will check email Monday through Friday no later than 9:00 pm to respond to questions about the course).

COURSE DESCRIPTION

In this course, pre-service teachers will understand the importance of and work to extend and deepen their understanding of the mathematical concepts taught at the K-8 grade levels and the pedagogical theories that accompany these concepts. They will have the opportunity to study and analyze the mathematics they will soon be teaching, focusing on math concepts and skills important in the elementary grades. Pre-service teachers will also learn strategies for creating memorable and lasting learning experiences for the elementary students in their charge and understand the research about teaching mathematical concepts so as to bridge the gap between theory and practice.

**Course Objectives**

\*This course supports the Educational Priorities and Outcomes of Cornell College and the InTASC Model Core Teaching Standards as noted following each objective.

Upon successful completion of INT 310, you will demonstrate through class discussion, presentations, written assignments and experiences the ability to:

1. Develop a deep understanding of mathematical skills and concepts taught at K-8 grade levels by learning to express abstract mathematical concepts in developmentally appropriate ways. *Cornell College* *Educational Priorities and Outcomes: Knowledge, Inquiry, Reasoning, Vocation; InTASC standards #1 and #4*

2. Have a greater appreciation and understanding of K-8 mathematics by engaging in math problem-solving activities that deepen conceptual understanding. *Cornell College* *Educational Priorities and Outcomes: Knowledge, Inquiry, Reasoning, Communication, Vocation; InTASC standards #3 and #9*

3. Develop lesson and assessment strategies that promote student understanding and positive attitudes toward mathematics. *Cornell College* *Educational Priorities and Outcomes: Knowledge, Inquiry, Reasoning, Vocation; InTASC standards #6 and #7*

4. Plan and teach engaging elementary school math lessons via games, children’s literature, technology, reading and/or writing aligned with the Iowa Core and the NCTM’s principles. *Cornell College* *Educational Priorities and Outcomes: Knowledge, Inquiry, Reasoning, Communication, Vocation; InTASC standards #7 and #8*

5. Understand your own perspectives and how these perspectives shift over time as you reflect on your own mathematical understanding and the effect of mathematical content knowledge on pedagogical content knowledge. *Cornell College* *Educational Priorities and Outcomes: Knowledge, Inquiry, Reasoning, Communication, Vocation; InTASC standards #4 and #9*

6. Understand how mathematical reasoning can be connected to children’s lived realities and can support interdisciplinary approaches to addressing challenges in schools, neighborhoods, communities, and on a global scale. *Cornell College* *Educational Priorities and Outcomes: Knowledge, Inquiry, Reasoning, Communication, Vocation; InTASC standards #2 and #5*

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 website.

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:

1. Attendance and punctuality, as well as preparation and professionalism are key to your success in this course, but alone do not constitute an A.
2. All assignments are to be completed on time (see specific deadlines listed on course calendar).
3. Bring course texts with you to class each day in order to participate fully in our discussions.
4. Cell phones should be turned off or silenced and put away for class time. I will designate time in class to record course-related information, times, and dates on smart phones and/or computers. We will schedule a mid-morning break time during which you can use your devices for social purposes. Unprofessional use of technology will be reflected in the final participation grade.
5. We will occasionally use computers to access online resources, as noted in the Class Plans. Notes are to be taken in your Reflection- Response Notebooks only.

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.

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 have course readings with you in class every meeting and your reflection notebook should be ready to share with a peer as well as available for your reference**), 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. We will engage in the mathematical concepts you will teach in elementary school. You will be expected to work on problems in small groups and contribute to the whole class activities in which we engage in mathematical problem solving. Being respectful of your colleagues, being positive and enthusiastic and demonstrating the willingness to explore new ideas are required as they are essential skills for pre-service teachers.

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 another extracurricular that takes you away from campus. In that case, please let me know in advance so I can clarify your need to be absent with your supervisor or coach if I have questions. 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 to class daily, questions you wish to discuss and your reflections to share with your classmates. You will be scheduled for teaching several lessons during this course. Be sure to plan your lesson as a professional, organize any materials needed (feel free to ask me if you have trouble finding what you need). Be ready to talk and write about your reactions to course concepts, assigned readings and classroom discussions.

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 to make unsubstantiated statements about children, families, and teachers. I expect you to show respect for the teaching profession and for the people you will serve within that profession.

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 of mathematics. You are expected to approach the resources, philosophies and ideas and the mathematical problem solving in the class with an open mind and professional disposition. It is important 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 and support of all participants as they work and learn together.

Professor Preview of Assignment

I will not preview assignments outside of class. 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. 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 so it is advisable to appropriately time your work on each assignment in order to take advantage of new information. **I will not accept late assignments unless arrangements have been made ahead of time and I consider your request to be reasonable.**

Grading Procedures

I will provide a written response to your assignments. Please see me if there is anything you need clarified. You also will evaluate your own performance because I believe it is essential for a teacher’s success to engage in ongoing reflective self-evaluation. I will consider your self-evaluative comments in the grading process.

**Grade Concerns:** If you have issues related to the grade you receive for any assignment, you are required to turn in a written document that clearly and professionally articulates and supports the strengths and weaknesses of your paper. Turn it in to me within two days after the assignment was returned to you, and then we will make an appointment to discuss your points in detail.

Note

If there are any specific accommodations you feel I need to make that are necessary for you to meet the objectives of the course due to a documented need, please discuss this with me on the first day of class so I can make necessary accommodations without delay.

Grading Scale/Assignment Point Totals:

**Assignment**  **Due Date** **Number of Points**

Analysis: “Understanding Math” 10/28 25

Practicum Reflection 10/26 25

Curriculum Analysis 11/4 100

A Series of 5 Lessons 11/11 at noon 100

Presentation of Series of 5 Lessons 11/12 25

Presentation: “Understanding Math” 11/13 25

Class participation self-evaluation 11/14 50

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 F

Assignment Descriptions

Below are brief descriptions of the graded assignments for this course.

Analysis: “Understanding Math” (25 points)

After the first week of class and your observations in math classrooms, you will be asked to write a reflection about what you have learned so far about what it means to “understand mathematics”: how information from the assigned readings and class discussion has affected your learning, what you have observed and done that relate to this question, how your ideas or beliefs have changed and what questions you continue to ponder.

Practicum Reflection (25 points)

After observing elementary math classes, you will write about the connections between class discussions, assigned readings and your observations. This reflection will be shared with your classmates and guide our discussion.

Curriculum Analysis (100 points)

This assignment is designed to provide you with the chance to explore curricular resources you may use in the future, develop understanding of how they are organized and analyze how curriculum materials connect to what we know about effective teaching and learning strategies. You will also be asked to select, develop, and adapt part of a lesson that needs to be modified to more effectively develop students’ math understanding.

A Series of 5 Lessons (100 points)

This assignment has several components. You will first reflect in written form on what you have learned about what it means to “understand mathematics” as a student AND as a teacher. (This is also the basis for the “Understanding Math” Presentation described below.)

For the second part of the paper, you will apply what you have learned about effective teaching strategies to create a set of five lessons that develops student understanding of a specific math concept.

For both sections, you will reference and cite the many resources used in class as well as any others that you found helpful.

Presentation of Series of 5 Lessons (25 points)

This presentation communicates the Series of Five Lessons project described above and includes explanations of the progression of chosen activities, your reasons for choosing them, and how the resources used in this class support your choices. You will also provide lesson plans for and teach one lesson or activity to your classmates.

Presentation: “Understanding Math” (25 points)

You will choose a creative and engaging format to share your learning journey about what it means to understand mathematics as a teacher and a student.

Class participation self-evaluation (50 points)

See descriptions of class participation expectations mentioned previously and the rubric provided. This will also include the Number Talk lesson you will teach.