EDUC4553
MATH AND SCIENCE METHODS AT THE ELEMENTARY LEVEL

Fall 2015 | Tuesdays: 4:35PM – 7:35PM | BK 750
September 15th – December 15th 2015
Instructor: Nina Araújo | Office Hours: By Appointment Only
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COURSE DESCRIPTION AND PURPOSE

The purpose of this course is to help pre-service teachers discover how elementary school children think about and learn mathematical concepts and science, and how to integrate mathematical concepts with scientific knowledge. The overall objective of teaching math and science should be to help each child develop the ability to understand the reasoning behind problems and how to solve them, as well as to enable them to become mathematically, scientifically and technologically literate. The focus of this class is on teaching for understanding, including a variety of methods that addresses diversity not only in the cultural realm, but also in the academic context.

Throughout this class, students will read, practice and discuss how to teach children to reason mathematically, solve problems employing a variety of strategies, and to communicate mathematically and scientifically about new and old knowledge. Students will be taught in a similar manner in how they are to teach, and are expected to participate actively in class problem solving. Students will experience how concepts and skills are developed from the concrete stage to the symbolic stage of development. In addition, video-based teaching modules will be presented to allow students the opportunity to observe mathematics and science use at the elementary level.

In addition to focusing on mathematics and science at the elementary level, we will also explore the role and benefits of technology in the classroom. When used appropriately and interactively, technology can be used to promote yet another entry point to learning in a constructive and creative manner.

REQUIRED COURSE READING MATERIALS

Bezuk, N. et al (2011). Learning Mathematics In Elementary And Middle Schools: A Learner-Centered Approach. Fifth Edition. Boston, MA: Pearson;

A copy of the Massachusetts Common Core Standards: Mathematics/Elementary.

REQUIRED WEBSITES

http://ivillagecentral.com
http://Zaption.com
http://voicethread.com
http://nctm.org
http://www.nsta.org

REQUIRED OBSERVATION LAB (30 HOURS)

The main goals of this field experience are:

- To meet the needs of various teacher preparation programs and background;
- To provide a collection of diverse tasks within a focus area (i.e.: interviews, guided observations, teaching experiences);
- To facilitate the process of connecting field experiences to what is discussed in class;
- To elaborate and provide activities that can further a candidate's understanding and application of the content offered in EDUC 4553.

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CLASS EXPECTATIONS ATTENDANCE

Attendance is mandatory. Please be on time for class. We already have a very limited time reserved for our meetings. The course is designed to keep students actively participating through every class, and therefore, it is extremely difficult to make up an absence.

CLASS EXPECTATIONS PARTICIPATION

Class participation will play a key role in the development of your skills as well as of your classmates' growth from each student's participation. In addition to working together during exercises, students will be required to comment on/during everyone's presentations and in-class discussions.

COURSE ASSIGNMENTS

All assignments are due electronically via your website. The only exception is your game project, for which you will have to develop a prototype and bring it to class.

GRADING BREAKDOWN

A=	94% – 100%
A-=	90% – 93%
B+=	87% – 89%
B=	84% – 86%
B-=	80% – 83%
C+=	77% – 79%
C =	74% – 76%

CLASS EXPECTATIONS WEEKLY READINGS

Completion of all required weekly readings. Generally, you can expect to read between 20 and 30 pages for each class session. Please plan accordingly! You are encouraged to take notes on the readings, jot down questions or areas of confusion, and draw connections among various assigned readings. During class, please be prepared to respond orally and in writing to the assigned readings, as well as to apply the readings to case studies and our video analyses observations. Please bring your textbook and reading notes with you to every class.

GRADING

You will either receive rubrics, or directions with clear expectations for every assignment to guide your progress and attempts at fulfilling the requirements for each project.

Class participation:	10%
Weekly Children's Lit:	20%
App Project:	5%
Game Night Project:	10%
In-class Activities and quizzes:	20%
Online Science Notebook:	10%
Unit Plan:	25%

NOTE: Late work will be marked down. For every class meeting the project is late, you will lose a full grade. Electronic submission applies to selected assignments – if you don't have it in class, you will have until midnight to submit your assignment on the day it is due.

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WEEK 1 – 9/15/15

Intro to class

Course Overview and website

MATH: rent or buy textbook. Info on website.

SCIENCE: submit website url by the end of class.

Texture pictures in your OSN by next class.

WEEK 2 – 9/22/15

MATH: Read Ch 1 and 2

Observations start (Zaption Tour)

SCIENCE: Read Assigned article and In-class Presentation

Children's Lit #1: Nina

Game Night Proposal and project explained.

WEEK 3 – 9/29/15

MATH: Read Chapter 3

Lab Assignment 1

SCIENCE: Read Assigned article and In-class Presentation

Children's Lit #2 and #3: see website

WEEK 4 – 10/6/15

MATH: Read Chapter 4

Lab Assignment 2

SCIENCE: Read Assigned article and In-class Presentation

Children's Lit #4: see website

Game night proposal due

WEEK 5 – 10/13/15

MATH: Read Chapters 5 and 6

Lab Assignment 3

SCIENCE: Read Assigned article and In-class Presentation

Children's Lit #5 and #6: see website

WEEK 6 – 10/20/15

MATH: Read Chapter 7

Lab Assignment 4

SCIENCE: Read Assigned article and In-class Presentation

Game Night!

WEEK 7 – 10/27/15

MATH: Read Chapters 8 and 9

Lab Assignment 5

SCIENCE: Read Assigned article and In-class Presentation

Children's Lit #7 and #8: see website

WEEK 8 – 11/3/15

MATH: Read Chapter 10

Lab Assignment 6

SCIENCE: Read Assigned article and In-class Presentation

Children's Lit #9: see website

Unit Plan Outline Due

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WEEK 9 – 11/10/15

MATH: Read Chapter 11

Lab Assignment 7

SCIENCE: Read Assigned article and In-class Presentation

Children's Lit #10: see website

WEEK 10 – 11/17/15

MATH: Read Chapters 12 and 13

Lab Assignment 8

SCIENCE: Read Assigned article and In-class Presentation

Children's Lit #11: see website

WEEK 11 – 11/24/15

MATH: Read Chapters 14 and 15

Lab Assignment 9

SCIENCE: Read Assigned article and In-class Presentation

Children's Lit #12: see website

WEEK 12 – 12/1/15

MATH: Read Chapter 16

Lab Assignment 10

SCIENCE: Read Assigned article and In-class Presentation

Children's Lit #13: see website

WEEK 13 – 12/8/15

MATH: Read Chapter 17

Observations start (Zaption Tour)

SCIENCE: Read Assigned article and In-class Presentation

WEEK 14 – TBD

Final Unit Plan Presentations

ACADEMIC MISCONDUCT

Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct either directly or indirectly through participation or assistance, are immediately responsible to the instructor of the class. In addition to other possible disciplinary sanctions that may be imposed through the regular instructional procedures as a result of academic misconduct, the instructor has the authority to assign an F, or zero in the course. For more information on the consequences of plagiarism please consult Northeastern University's student handbook.