

**The School of Education  
Houston Baptist University**  
**Course Syllabus**  
**INDC 4360. Essential Elements of Math**  
**Fall, 2013**

**COURSE DESCRIPTION**

This course prepares prospective teachers with knowledge of the content, methods, and materials needed to teach mathematics effectively in elementary and middle school grades. Students explore ways to develop children's problem solving and reasoning abilities as well as their understanding and use of whole numbers, decimals and fractions. Active learning using models and manipulatives is emphasized. Fieldwork in which students teach mathematics in an elementary or middle school is required.

**COURSE SEQUENCE IN CURRICULUM AND PREREQUISITE INFORMATION**

This course may only be taken by students who have been officially accepted into the HBU teacher education program and who have completed EDUC 4301 or 4311 (Curriculum and Instruction) with a grade of "B" or higher. It must be completed before student teaching. It is highly recommended that elementary education students take this course concurrently with EDEC 4313. Early Childhood Curriculum and Instruction.

**DATE AND TIME OF CLASS MEETINGS:** Tuesday and Thursdays 8:00-10:30 a.m.

**INSTRUCTOR INFORMATION**

Name/Title: Dr. Olivia Elmore

E-mail: oelmore@hbu.edu

Office Location: H346A or H328B

Office Hours: Tues. 1:30 - 4:30p.m.

Thurs. 1:30 - 4:00p.m

Additional Hours Before or After Class by Appointment

**LEARNING RESOURCES**

Course Text(s):

Van De Walle, John A., Karp, Karen S. & Bay-Williams, Jennifer M. 2013. *Elementary and middle school mathematics, Eighth edition*. Boston: Pearson. ISBN 13: 978-0-13-261226-5

Other Required Materials:

Math Materials Packet, 2009 Version. Dr. Linda Brupbacher. HBU Bookstore

## RELATION TO THE MISSION OF THE UNIVERSITY

The mission of Houston Baptist University is to provide a learning experience that instills in students a passion for academic, spiritual, and professional excellence as a result of our central confession, “Jesus Christ is Lord.”

In relation to the mission of the University, this course will help students gain professional knowledge and experience regarding the teaching of math within the context of a rigorous academic and field-based experience.

## RELATION TO THE GOALS AND PURPOSES OF THE SCHOOL OF EDUCATION

The mission of The School of Education is to prepare students to be effective professional educators who reflect Christ in their work and service.

To accomplish this mission we will provide students with the following:

- the courses and mentoring necessary for a **solid pedagogical grounding** in the art, science, and practice of teaching;
- **essential learning experiences** that will provide a sure foundation of knowledge and wisdom; and,
- an understanding of their **Christian mission and calling** as educators to influence individual students and the larger society.

In relation to the stated goals and purpose of the School of Education, this course will help students develop and apply knowledge about math learning (including instructional strategies and materials) that will serve as a foundation for effectively teaching elementary and middle school math. They will also explore how they as teachers can influence individual students and the larger society.

## COURSE LEARNING OBJECTIVES

Upon completion of this course, students should be able to:

1. Demonstrate knowledge of the organization and content of grade one through six math as articulated in TEKS (Texas Essential Knowledge and Skills)
2. Describe, demonstrate and justify methods and materials for elementary and middle school math instruction that reflect current knowledge and practice -- and which increase conceptual understanding, procedural knowledge, higher order thinking skills, problem solving abilities, life applications and communication skills
3. Describe and analyze effective processes for utilizing teacher-made and standardized testing
4. Describe, demonstrate and analyze methods for helping students become skilled problem solvers
5. Describe, demonstrate and analyze materials and processes for helping students develop a deep, flexible, and practical understanding of place value
6. Describe, demonstrate and analyze materials and processes for helping students develop operational sense (the ability to determine & use appropriate computational process(es) when solving routine word problems)

7. Describe, demonstrate and analyze materials and processes for helping students master facts
8. Describe, demonstrate, and analyze materials and processes for helping students develop computation skills (addition, subtraction, multiplication and division)
9. Describe and analyze materials and processes for helping students understand and use fractions and decimals.
10. Create and demonstrate the use of math manipulatives and technology resources for helping students become mathematically proficient

## **SCHOOL OF EDUCATION REQUIREMENTS RELATED TO TExES STANDARDS**

- The course learning objectives acquired through the experiences in this course supports the TEA Standards for Pedagogy and Professional Responsibilities and Standards.
- A matrix at the end of this document indicates the PPR topics addressed.
- Appropriate grade level TEA guidelines and TEKS are referenced as part of this course may be found at: <http://www.tea.state.tx.us/index2.aspx?id=6148>
- A list of specific competencies for this course is presented below. A complete listing of SBEC Standards for all certifications including knowledge and skills statements may be found at:  
[http://www.tea.state.tx.us/index2.aspx?id=5938&menu\\_id=2147483671&menu\\_id2=794](http://www.tea.state.tx.us/index2.aspx?id=5938&menu_id=2147483671&menu_id2=794)

### **The following TExES Pedagogy and Professional Responsibilities Standards are addressed in part or in full in this course:**

Domain I. The teacher designs instruction appropriate for all students that reflects an understanding of relevant content and is based on continuous and appropriate assessment.

Competency 004: The teacher understands learning processes and factors that impact student learning and demonstrates this knowledge by planning effective, engaging instruction, and appropriate assessments.

Domain II. The teacher creates a classroom environment of respect and rapport that fosters a positive climate for learning, equity, and excellence.

Competency 005: The teacher knows how to establish a classroom climate that fosters learning, equity, and excellence and uses this knowledge to create a physical and emotion environment that is safe and productive.

Competency 006: The teacher understands strategies for creating an organized and productive learning environment and for managing student behavior.

Domain III. The teacher promotes student learning by providing responsive instruction that makes use of effective communication techniques, instructional strategies that actively engage students in the learning process, and timely, high-quality feedback.

Competency 007: The teacher understands and applies principles and strategies for communicating effectively in varied teaching and learning contexts.

**The following TExES EC-6 Generalist standards are addressed in part or in full in this course:**

Domain II: Mathematics

Competency 013. Mathematics Instruction. The teacher understands how students learn mathematical skills and uses that knowledge to plan, organize, and implement instruction and assess learning.

Competency 014 . Number Concept and Operations. The teacher understands concepts related to numbers, operations and algorithms, and the properties of numbers.

Competency 015. Patterns and Algebra. The teacher understands concepts related to patterns, relations, functions and algebraic reasoning.

Competency 016. Geometry and Measurement. The teacher understands concepts and principles of geometry and measurement

Competency 017. Probability and Statistics. The teacher understands concepts related to probability and statistics and their applications.

Competency 018. Mathematical Processes. The teacher understands mathematical processes and knows how to reason mathematically, solve mathematical problems, and make mathematical connections within and outside of mathematic.

## **TOPICAL OUTLINE**

The content of this outline and the attached schedule are subject to change at the discretion of the professor. A course agenda is included at the end of this syllabus. It includes the following topics:

1. What's Involved in Mathematics
2. Teaching Mathematics: Principles for Helping Students Learn Mathematics
3. Developing Problem Solving Abilities and Using Them to Teach
4. Developing Whole-Number Place-Value Concepts
5. Developing Meanings for the Operations
6. Helping Students Master the Basic Facts
7. Developing Strategies for Whole-Number Computation and Estimation
8. Developing Fraction and Decimal Concepts
9. Geometry and Measurement

## TEACHING STRATEGIES

A variety of learning methods will be used including:

1. Reading, lecture and discussion
2. Reflection and journaling
3. Demonstration/modeling of the use of strategies & materials
4. Small group activities
5. Simulations and role plays
6. Practice exercises
7. Use of media and technology
8. Making and using manipulatives
9. Taking and analyzing Grades 3-8 STAAR Tests
10. Fieldwork in an elementary school classroom
11. Individual conferences
12. Self-assessment

## ASSESSMENT OF LEARNING

### Course Requirements

Foundational learning experiences required for all students seeking **initial teacher certification** are included in this course.

Assignment	Learning Objective(s)	Point Value	Due Date
Exam I	1, 2, 4	50%	See agenda at end of syllabus for due dates.
Exam II	5, 6, 7	<i>(Exams I-III: 12% each &amp; final exam 14%)</i>	
Exam III	8, 9		
Comprehensive Final Exam	1-9		
Field Experience with Related Paper (20 days for 1 ½ hours per day)	2, 10	25%	
Additional Learning Activities *		25%	
• TEKS	1		
• STAAR Analyses	1, 3		
• Journals	All		
• Materials	10		
• Technology Project	10		

\* Each of these will result in a 1-100 score and an average of these scores will be determined. All except TEKS will count double in the calculation.

## Grading Standards

### School of Education Undergraduate Grading Scale:

92-100 (A); 84-91 (B); 76-83 (C); 70-75 (D); <70 (F)

## Student Appraisal

Students will complete faculty appraisal forms as regularly administered by the University.

## CLASS POLICIES

Fieldwork Policy. In this course, special attendance policies apply to fieldwork. It is expected that students complete all fieldwork hours. Fieldwork should only be missed for documented emergencies beyond the control of the student (illness, death in the family, etc.). Both the classroom teacher and the HBU professor should be notified prior to any missed days. The student must then arrange a mutually agreeable make-up time with the classroom teacher. A minimum of 27 of the 30 hours of fieldwork must be completed to receive credit for this course. Deductions in the fieldwork grade will be made for unexcused absences and for any of the 30 required fieldwork hours not completed.

Late Work. All assignments are expected to be completed in their entirety by the beginning of class on the due date, even if the student is not in class. Late work will only be accepted with proper documentation of illness or other emergency situations beyond the control of the student. The work must then be turned in to the student's folder no more than one week after the student returns to class. No work will be accepted after the last day of class.

Missed Exams. All exams should be taken on the day and at the time when they are scheduled. Make-up exams will be given ONLY when the instructor is notified prior to the exam, and there is a documented excused reason for missing the exam. Legitimate reasons include documented illness, death in the family, etc. A make-up test will then be completed at a time mutually agreed upon by both the professor and student—as soon as possible after the exam date. Any unexcused absence on the test day will result in a grade of zero for the particular test with no opportunity for a make-up test.

Use of Electronic Devices. During class sessions, electronic devices are only to be used to support class activities. Other uses (texting, surfing the web, etc.) will result in the device not being allowed in the classroom.

## PERSON RESPONSIBLE FOR DEVELOPING SYLLABUS

Dr. Olivia Elmore

Students are required to read the University Classroom Policy addendum to this course syllabus

*Dr. Olivia Elmore*

Instructor's Signature

August 1, 2013

Date

**INDC 4360. Essential Elements of Math  
TENTATIVE FALL 2013 SCHEDULE**

*Note: This is a non-traditional schedule because this class requires 20 mornings of fieldwork. To accommodate this, the class is scheduled for a longer time period than the typical class. HBU class sessions will be held from 8:15-10:45 on Tuesdays and Thursdays during non-fieldwork weeks. During fieldwork, students will work in an assigned class for 1 ½ hrs. each day Mon. through Fri.*

DATE	TOPIC	READING	ASSIGNMENT DUE
Aug. 27	Introduction /Overview <b>What's Involved in Mathematics</b>		
Aug. 29	<b>Standards-based Teaching</b> Sign up for bean color	Ch. 1	<b>Signed Syllabus Statement and the Professional Integrity Statement.</b> <b>TEKS – Elem. School K-6; Middle School 3-8</b>
Aug. 30	<b>Aug 30: CENSUS DAY - LAST DAY TO DROP WITHOUT A “W”</b>		
Sept. 5	<b>Models &amp; Manipulatives</b> <b>Problem Solving</b>	Ch. 3-4	<b>Journal Entry 2</b> <b>ATPE Membership Form</b> <b>HISD Criminal History Check Forms &amp; Fieldwork Application</b>
Sept. 10	<b>Review</b> Discussion of 3 <sup>rd</sup> grade STAAR content		<b>GRADE 3 STAAR ANALYSIS</b> <b>Journal Entry 3</b>
Sept. 12	<b>EXAM 1</b>		
Sept. 17	<b>Meanings for Operations</b>	Ch. 9	<b>BEANS</b> <b>GRADE 4 STAAR ANALYSES</b> <i>*Materials: 1 Set of Storyboards; Structured Mats Kits</i>
<b>SEPT. 15: APPLICATION DEADLINE FOR SPRING PRACTICUMS &amp; STUDENT TEACHING</b>			
Sept. 19	<b>Facts</b>	Ch. 10	Journal Entry 4 <i>*Materials: Fact Finder Grid</i>
Sept. 24	<b>Whole Number Place Value</b> Discussion of Grade 5 STARR content	Ch. 11	<b>GRADE 5 STAAR ANALYSIS</b> Journal Entry 5 <i>*Materials: Happy Face Pieces with Place Value Boards</i>
Sept. 26	Review.		Journal Entry 6
Oct. 1	<b>EXAM 2</b>		
Oct. 3	<b>Addition &amp; Subtraction</b> Discussion of Grade 5 STAAR content Technology-based Resources Project	Ch. 12	<b>GRADE 6 STARR ANALYSIS</b> Journal Entry 7
Oct. 8	<b>Multiplication &amp; Division</b>	Ch. 13	Journal Entry 8 <i>*Materials: Strip kit, pie pieces, Cups &amp; beans</i>
Oct. 10	<b>Fractions &amp; Decimals</b>	Ch. 15 & 17	Journal Entry 9
Oct. 15	Review & Fieldwork Preparation		Journal Entry 10
Oct. 17	<b>EXAM 3</b>		
Oct. 22	Technology-based Resources Project Sharing Fieldwork Preparation – Room 4204		<b>TECHNOLOGY-BASED RESOURCES PROJECT</b>
FIELDWORK October 24th - Nov. 21st <b>Seminar</b> Th. Oct. 31st at 9 a.m. at HBU (H115) [Nov. 22nd-26th MAKE-UP DAYS]			
<b>THANKSGIVING HOLIDAY November 27-29</b>			
Dec. 3	<b>Geometry &amp; Measurement</b>	Ch. 19-20	<i>*Materials: Tangram</i>
Dec. 5	Fieldwork Debriefing & Review		<b>PORTFOLIO</b>
TBA	<b>COMPREHENSIVE FINAL EXAM:</b> Dec. 10-13		

*Changes to the tentative agenda may be made by the professor with timely student notification.*

## COURSE ACKNOWLEDGEMENTS

### Syllabus Statement

I am aware of all topics listed and described in the EDUC 2320 course syllabus --by reading the syllabus on my own and through class discussions. Such topics include, but are not limited to the following:

- course description; course sequence in the curriculum and pre-requisite information;
- instructor information and learning resources;
- relation to the mission of the University and to the goals and purposes of School of Education;
- course learning objectives;
- TexES competencies covered;
- topical outline and learning strategies;;
- assessment for learning: requirements & grading standards;;
- **HBU CLASS POLICIES – Please read the secondary document uploaded to Blackboard;**
- additional policies for this class: **attendance**, late work, missed tests and electronic devices; and
- the possibility of changes to the syllabus. [The content of this syllabus and the attached agenda are subject to change at the discretion of the professor.]

### Professional Integrity Statement

To maintain and uphold the highest level of professional integrity and honesty, cheating and plagiarizing are not allowed.

Cheating is a catch-all term for not doing your own work. Within the broader view of cheating is the idea of using someone else's work in place of your own. This is called plagiarism and is not allowed in this class. If a student cheats and/or plagiarizes, then the student will receive a "0" for the assignment and/or fail the course. Any attempt during a test to consult with notes or another person or to look at another's test will constitute cheating. If you share answers in any way, both students will receive a "0" for the test and/or fail this course. Using stolen tests or "borrowed" tests (any test that is not readily available to all members of the class) to study for an exam is cheating and will result in a "0" and/or course failure. **DO NOT:**

- copy another person's paper/project/work or part of that and turn it in as your own;
- copy a paper/project from the Internet and turn them in as your own;
- copy another paper/project (or cut and paste parts of Internet articles), make changes to it, and submit it as your own;
- include the work of others without documentation/reference (If seven or more words are taken directly from another source it must be quoted and referenced.);
- submit a paper/project or large parts of a paper/project you have done for another class at HBU or another institution to this class. (Always get a professor's approval before using a prior work or topic from a different class.);
- have someone write parts or all of your paper/project/work
- share your work with others; and,
- change references or make up references.

By signing this page, **I affirm** that I have read and understand the contents of this course **Syllabus Statement and the Professional Integrity Statement**. I understand that at any time during the course, I may request clarification, if needed.

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Printed Name

Signature

Date

[After reading the course syllabus and this page, please **print and sign** this form then put it in your class folder.]



## Pedagogy and Professional Responsibilities Course Correlation to TAC §228.30\*

\*Source: *TEA Audit Monitoring Handbook 2009*

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EC-12 PPR Standard	Curriculum Topic TAC §228.30	Essential Components	Learning Experiences/ Products
I, III	<b>1. Reading Instruction</b> <i>Programs are encouraged to select from a variety of theories and methods appropriate for teaching these five essential components of reading instruction.</i>	1. Text Structure (organization) 2. Vocabulary teaching strategies 3. Identifying the word (root, prefix, suffix) 4. Fluency (words per minute correct) basic teaching strategies 5. Comprehension (finding main idea, summarizing, supporting details, synthesizing/making connections, inferences, making generalizations)	
II, IV	<b>2. Code of Ethics</b>	Texas Educators' Code of Ethics TAC§ 247.2	Field Prep
I, II, III	<b>3. Child Development</b>	Programs will teach a variety of theories for child development.	
I, II, III,	<b>4. Motivation</b>	Programs will select from a variety of theories and methods appropriate for teaching motivation.	
I, II, III	<b>5. Learning Theories</b>	Programs will teach a variety of learning theories	Exam 1
I, III	<b>6. TEKS Organization,</b>	<a href="http://ritter.tea.state.tx.us/teks/">http://ritter.tea.state.tx.us/teks/</a>	Journals
I, III	<b>7. Content TEKS</b>	<a href="http://ritter.tea.state.tx.us/teks/">http://ritter.tea.state.tx.us/teks/</a>	Journals
I, II, IV	<b>8. TAKS Responsibilities</b>	<a href="http://www.tea.state.tx.us/">http://www.tea.state.tx.us/</a> click on Testing/ Accountability, click on Texas Essential Knowledge and Skills for much more information.	TAKS Analyses
I, II, III	<b>9. Curriculum Development and Lesson Planning</b>	Programs will select from a variety of theories and methods appropriate for teaching curriculum development and lesson planning.	Exams & Field
I, III	<b>10. Classroom Assessment and Diagnosing Learning Needs</b>	Programs will select from a variety of theories & methods appropriate for teaching formative assessment to diagnose learning needs & other types of classroom assessment.	TAKS Analyses
II, IV	<b>11. Classroom Management</b>	Programs will select from a variety of theories & methods appropriate for teaching classroom management.	Field
I, II, III, IV	<b>12. Special Populations</b> ELPS—English Language Proficiencies <a href="http://ritter.tea.state.tx.us/curriculum/biling/elps.html">http://ritter.tea.state.tx.us/curriculum/biling/elps.html</a> National Assoc. for Gifted Children Teacher Knowledge and Skills <a href="http://www.nagc.org/index2.aspx?id=1863">http://www.nagc.org/index2.aspx?id=1863</a> TEA website resources <a href="http://ritter.tea.state.tx.us/special.ed">http://ritter.tea.state.tx.us/special.ed</a>	<b>A. ESL/ Bilingual ELPS</b> 1. learning strategies 2. listening 3. speaking 4. reading 5. writing <b>B. G/T</b> 1. Learner characteristics and development 2. Instructional strategies 3. Socio-cultural influences 4. Identifying GT <b>C. Special Education</b> 1. Acronyms/Terms 2. Modifications/ Accommodations 3. Inclusion 4. Parent Involvement 5. Discipline	
III, IV	<b>13. Parent Conferencing and Communication Skills</b>	Programs will select from a variety of theories and methods appropriate for teaching communication skills and parent conferencing.	Exam 1 Role Play
I, III	<b>14. Instructional Technology</b> <a href="http://www.sbec.state.tx.us/SBECOnline/standtest/edstancertfieldlevl.asp">http://www.sbec.state.tx.us/SBECOnline/standtest/edstancertfieldlevl.asp</a>	<b>SBEC Technology Standards for All Teachers</b> 1. Tech terms, concepts, data input strategies and ethical practices to make informed decisions about tech app 2. Identify task requirements, apply search strategies, use tech to acquire, analyze, and evaluate a variety of information 3. Use technology to synthesize knowledge, create and modify solutions, and evaluate results 4. Communicate in different formats. 5. Plan, organize, deliver and evaluate instruction that uses technology, and technology TEKS for students.	Technology Resource Project
I, III, IV	<b>15. Pedagogy/ Instructional Strategies</b> <a href="http://olc.spsd.sk.ca/DE/PD/instr/index.html">http://olc.spsd.sk.ca/DE/PD/instr/index.html</a>	Programs will teach a variety of instructional strategies suitable for all classrooms and also for specific subjects and content.	Exams Class Activities
I, II, III, IV	<b>16. Differentiated Instruction</b>	Programs will teach a variety of instructional strategies suitable for differentiating instruction.	
IV	<b>17. Certification Test Preparation</b> (6 clock hrs required)	Testing study guides, standards, frameworks, competencies <a href="http://www.texas.ets.org">www.texas.ets.org</a>	Field Paper