

15800 Calvary Rd  
Kansas City, MO 64147

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Course: ED 434 D & ND Teaching Elementary Mathematics II  
Credit: 3 credit hours  
Semester: Spring, 2024 (Cycle 5) March 11 – May 3  
Time: 8:00 – 9:20 a.m. on Mondays & Wednesdays  
Instructor: Dr. Karen Hange  
Location: East Education, Room 125  
Contact Info: Office phone: 816-425-6186      Email: [karen.hange@calvary.edu](mailto:karen.hange@calvary.edu)

## I. DESCRIPTION

This course introduces the principles of teaching mathematical concepts and skills including number theory, addition, subtraction, multiplication, division, fractions, proportional reasoning, algebra, geometric concepts, data representation, and probability investigations. Each topic will be investigated through each stage of mathematical literacy within the elementary grades. Strategies for developing critical thinking and problem solving in mathematics will be developed. Consideration is given to curriculum development, differentiated instructional planning, instructional technology, and English language learners. (Prerequisite: ED190 and ED345 or permission from the Education Department program director; must be officially admitted to Teacher Education program)

*This course is offered in two formats: in-person and online. Students registered for in-person attend the classes in person, online students attend the classes via the online classroom. For both in-person and online students, assignments, and interaction outside of the class period are done in the learning management system.*

## II. DEPARTMENTAL THEME STATEMENT

The Educator Preparation program at Calvary promotes the development of teachers within a distinctly Christian environment grounded in a Biblical philosophy of education. The program emphasizes pedagogical skills, differentiated learning, diversity appreciation, instructional technology and a search for truth while setting standards for professionalism and character for each teacher candidate. Students should graduate with a desire to be lifelong learners and servant-leaders.

## III. OBJECTIVES

### A. General competencies to be achieved. The student will:

1. Recognize and reflect on the **attributes of God** as seen through creation and mathematics.
  - a. PLO-1; MTS 1, 2, 6
  - b. Assignments: B1, B4

2. Recognize the central concepts, structures, and **tools of inquiry** in the mathematics discipline to create learning experiences that are meaningful and engaging for all students with a focus on curriculum for grades 4-6.
  - a. PLO-2, 3, 4, 5; MTS 1, 4, 5, 7
  - b. Assignments: A1, A2, B1, B2, B3, B4
3. Analyze **how students learn**, develop, and differ in their approaches to learning.
  - a. PLO-2, 4, 5; MTS 2, 5, 6, 7
  - b. Assignments: A1, A2, B1, B3, B4

**B. Specific competencies to be achieved. The student will:**

1. Evaluate and utilize contemporary **mathematics standards** and curriculum materials for mathematics education as articulated by NCTM guidelines and the MO Learning Standards.
  - a. PLO 2, 3, 6; MTS 1, 3, 7
  - b. Assignments: A1, A2, B1, B2, B3
2. Create and **implement lessons** to facilitate student action to address real-world problems and engage students in inquiry thinking including concepts necessary to children's future mathematical endeavors.
  - a. PLO 2, 3, 4, & 5; MTS 2, 4, 5
  - b. Assignments: A3, B1, B2, B3
3. Connect instruction to culture and community; synthesize a comprehensive and consistently **biblical worldview** of elementary mathematics.
  - a. PLO 1; MTS 1, 2, 4, 6
  - b. Assignments: A1, B1, B4
4. Evaluate research-based models of **critical thinking and problem-solving**, including instructional strategies such as teaching from the concrete to the abstract and using manipulatives/pictorial math models to support student engagement in higher level thinking.
  - a. PLO 2, 4, 5; MTS 1, 4, 7
  - b. Assignments: A3, B1, B2
5. Understand individual/group motivation and behavior to create a **learning environment** that encourages active engagement in learning, facilitating cooperative learning through math lessons, develop positive social interaction, and self-motivation.
  - a. PLO 1, 2, 4; MTS 2, 5, 6, 8
  - b. Assignments: A2, B1, B3
6. Analyze effective **technology applications** to foster active inquiry, collaboration, and supportive interaction in the classroom.
  - a. PLO 2, 4, 5, 6; MTS 1, 3, 7, 9
  - b. Assignments: A2, B2, B3

**IV. MATERIALS required for this course:**

**A. Bible** (see note below in course policies)

**B. Textbooks**

Tipps, Steve, Art Johnson, and Leonard M. Kennedy. *Guiding Children's Learning of Mathematics*, 13<sup>th</sup> edition, Boston, MA: Cengage Learning, 2018. (ISBN: 978-1-305-96066-4)

This course will require MindTap from Cengage. **You must purchase through Cengage...do not try to purchase through Amazon or buy a used copy of this textbook!**

**MindTap** is a learning platform that will include videos, quizzes and other activities specifically for this course through Cengage Unlimited. **You may also request a print copy of the textbook and extend use beyond the subscription dates**

If you purchased Cengage Unlimited during ED 345, then there should be no additional cost for access for this course. If you were not enrolled in ED 345, then your cost to access MindTap for this course will be approximately \$80. To get started visit: **Cengage Start Strong Website** at <https://startstrong.cengage.com> for step-by-step instructions.

**Other**

**National Council of Teachers of Mathematics** website: <http://www.nctm.org/>

The NCTM is a voice of mathematics education, providing vision, leadership, and professional development to support teachers in ensuring mathematics learning of the highest quality for all students. The Council's "Principles and Standards for School Mathematics" are guidelines for excellence in mathematics education and issue a call for all students to engage in more challenging mathematics.

**Missouri Learning Standards for Mathematics**

<https://dese.mo.gov/media/pdf/curr-mls-standards-math-k-5-sboe-2016>

These are the Learning standards created by the Department of Elementary and Secondary Education for the state of Missouri. These goals ensure that all teachers in Missouri are guided by the same goals to promote equity across the state. DESE supports Missouri school districts as they develop coherent and focused standards-based mathematics standards that improve classroom instruction.

**Journals in JSTOR from National Council of Teachers of Mathematics**

<a href="#"><u>Journal for Research in Mathematics Education</u></a>	1970 - 2019
<a href="#"><u>Journal for Research in Mathematics Education. Monograph</u></a>	1985 - 2008
<a href="#"><u>The Mathematics Teacher</u></a>	1908 - 2019
<a href="#"><u>Mathematics Teacher Educator</u></a>	2012 - 2018
<a href="#"><u>Teaching Children Mathematics</u></a>	1994 - 2019
<a href="#"><u>The Arithmetic Teacher</u></a>	1954 - 1994

*JSTOR is currently offering a free registration for up to 100 articles per month.*

**V. REQUIREMENTS**

**A. Weekly Assignments**

**1. Reading**

Read the assigned textbook according to the reading schedule provided in the Tentative Class Schedule. Reading the text thoroughly will provide a context for class discussion and activities. There will be 1-2 chapters per week with accompanying activities.

**2. Cengage Activities & Video responses**

Each chapter in the textbook will include some video vignettes and quizzes based upon the material in the chapter. Students will access these activities through CANVAS and CENGAGE.

**3. Math Skills & Critical Thinking Activities**

The focus of this class will be on solidifying student understanding of the math concepts for elementary students. Each chapter will have several practice activities that will be assigned by the instructor to demonstrate understanding and provide hands-on experiences in the types of activities students may use in their future classrooms.

**B. Course Projects**

**1. Mathematics Tutoring**

Students will be connected to an elementary child who would benefit from some weekly math tutoring and meet with that student 2 times per week for 6 weeks—a total of 12 sessions. Each session will meet for 30-45 minutes. Students will submit a tutoring plan form for each “session” that will include activities, concepts, materials, behavior, and Biblical integration principles. A reflection section will also be included to be filled out as a follow-up to the tutoring session to identify the strategies that worked well and areas to improve or provide further practice with for future tutoring sessions. A template will be provided in CANVAS. A final reflection summary will be submitted at the end of the course to describe the overall experience and the reflect on the lessons learned.

**2. Meaningful Math Site Analysis**

Students will locate 10 different websites or supplementary resources that can be used to practice math facts and learn math concepts. Students will locate, explore, and spend some time interacting with the different sites or resources to determine ease of use and viability for elementary students in the classroom. Submit links to the websites and an analysis of the program. Further details for this assignment will be provided in CANVAS.

**3. Eureka Math Teaching Experience--2 separate mini-lessons presented in class**

- Teach a 15-20 minute lesson. One will be from a Eureka Math lesson for lower elementary and one for upper elementary.
- Students will be required to watch several Eureka math training videos and write responses based on their understanding of this new approach.

**4. Personal Philosophy Paper: Best Practices for Teaching Math**

What we believe matters. Many of the attributes of God are reflected in mathematical principles. Write a 1,200-word essay that describes what you believe about the principles of math and the learning principles that you feel will work best for your teaching style. Be sure to include at least 3 attributes of God that could be communicated to your students through math instruction. Support with Scripture.

**VI. METHODS**

**A. Teaching**

1. Lectures
2. Small and large group discussion
3. Research and reading
4. Projects
5. Writing
6. Practicing skills

**B. Grading**

**1. Weight given to assignments:**

Math Tutoring Experience	320 points
Eureka Instructional Video Responses	180 points
Eureka Teaching demonstration (2 lessons x 75 points)	150 points
Meaningful Math Websites	100 points
Personal Philosophy of Teaching Math	100 points
Weekly quizzers & Cengage activities (20 points each chapter)	200 points
Math Skills & Critical Thinking Activities (25 points each week)	<u>200 points</u>
Weekly Participation in Class or Online	<u>250 points</u>
<b>Total points for the class</b>	<b>1500 points</b>

**2. Late Assignments**

Late assignments may be penalized at the discretion of the instructor.

**3. Letter / Numerical Grade Scale**

The grading scale listed in the current University Catalog will be used for this course.

## VII. COURSE POLICIES

### A. Grade Requirements

Education majors must maintain a high standard for GPAs to successfully complete their program. Education majors must maintain a 3.0 GPA in Professional Education and Content Area coursework. *This course must be passed with a grade of "C" or higher depending on the student's GPA in Professional and Content Area courses. Receiving a grade lower than a "C" will mean that this course must be repeated.*

### B. The Bible as Required Textbook

The Bible is a required textbook in every course at Calvary University. To facilitate academic level study, students are required to use for assignments and research an English translation or version of the Bible based on formal equivalence (meaning that the translation is generally word-for-word from the original languages), including any of the following: New American Standard (NASB, English Standard Version (ESV), New King James (NKJV), or King James (KJV). Other translations and versions based on dynamic equivalence (paraphrases, and thought-for-thought translations like NLT and NIV) may be used as supplemental sources. Please ask the professor if you have questions about a particular translation or version.

### C. Academic Honesty

*Plagiarism is defined as copying any content without identifying the source. This also includes taking another person's or AI entity's ideas or constructs and presenting them as your own. The use of AI generated content in student work is prohibited (even if cited) as it does not represent original work created by the student and is an unreliable aggregate of ideas from other sources. Plagiarism of any kind will not be tolerated.*

### D. Attendance

Students must engage in the weekly in-class session(s).

Students who are enrolled as in-person students are expected to be punctual and present in-person for each class session.

Students who are enrolled as online students will demonstrate their engagement by submitting a thorough video reflection form and any additional participation activities BEFORE THE NEXT CLASS SESSION.

### E. Class Participation

Students are expected to attend class and participate in discussing the daily material. Learning takes place best when the student is personally involved in the process. Cell phones should be set to silent and placed on the table or in a backpack/purse. *Working on other assignments during class or using electronic devices for anything other than class activities or taking notes for the course will not be permitted.*

### F. Accommodations Statement

Students with disabilities have the responsibility of informing the Accommodations Support Coordinator (aso@calvary.edu) of any disabling condition that may require support.

### G. Style Guide

All class papers must follow the APA style according to the *Publication Manual of the American Psychological Association, 7th edition*.

### H. The Clark Academic Center

**The Clark Academic Center** (learning@calvary.edu) is dedicated to providing free academic assistance for Calvary University students. Student tutors aid with all facets of the writing process, tutor in various subject areas, prepare students for exams and facilitate tests. Please take advantage of this service.

**About Changes to this Syllabus:** *The instructor reserves the right to make changes to this syllabus at any time during the course, but any change made will only be done after clearly communicating the need for the change and the specific change to be made via in-class announcement and Canvas announcement.*

## VIII. TENTATIVE SCHEDULE

Week	Dates	Class Topics	Assignments
1	3/11 & 3/13	Developing Number Operations & Computational Fluency with Large Numbers Chapters 10 & 11	Looking ahead to future assignments  Tutoring Experience: 2 submissions per week for 6 weeks
2	3/18 & 3/20	Understanding Decimals & Fractions Chapter 12 & 13	
3	3/25 & 3/27	Developing Understanding of Ratio, Proportion & Percent Chapter 14	Due: Math Website Analysis
4	4/1 & 4/3	Thinking Algebraically Chapter 15	Due: Eureka Instructional Videos
5	4/8 & 4/10	Geometric Concepts & Systems Chapter 16	Due: Teaching Experience Eureka Math Lesson #1
6	4/15 & 4/17	Concepts of Measurement Chapter 17	Due: Personal Philosophy for Teaching Math
7	4/22 & 4/24	Representing Concepts of Data Chapter 18	Due: Teaching Experience Eureka Math Lesson #2
8	4/29 & 5/1	Investigating Probability Chapter 19	Due: Tutoring Reflection Summary