CALVARY UNIVERSITY

15800 Calvary Road
Kansas City, MO 64147-1341

Syllabus

Course: ED 344 T & NT Teaching Elementary Science
Credit: 3 hours
Semester: Fall, 2024 Sessions 1 & 2 August 19 – December 13 (This is a 16-week class)
Time: 9:30 – 10:50 a.m. Tuesdays & Thursdays
Location: East Education Building, Room 125
Instructor: Dr. Karen Hange
Contact Info: karen.hange@calvary.edu Office: 124 East Ed Building Cell: 816-425-6186

A. DESCRIPTION

This course explores various strategies and materials used in elementary school science programs with a special emphasis on use of educational technology, experiments, laboratory experiences and learning activities. Students will develop the knowledge, skills, and strategies needed to incorporate health and physical education competencies into elementary classroom integrated curriculum. Consideration is given to curriculum development, differentiated instructional planning, instructional technology, and English language learning. (Prerequisite: ED190 or permission of 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 the **nature**, value, and importance of science in elementary education.
    a. PLO-1, 2, 3, 4, 5, 6; MTS 1, 3, 4, 6
    b. Assignments: A1, B1, B2, B4

2. Demonstrate understanding of the big ideas of **science content**, the scientific process, inquiry investigation, and the nature of science appropriate for students in grades 1-6.
    a. PLO-1, 2, 3, 4, 5; MTS-1, 2, 3, 4, 6, 7
    b. Assignments: A1, A2, A3, B1, B2, B3, B4, B6

3. Understand the social, intellectual, and personal developments of students and recognize the **diverse needs**, interests, and abilities of students in regard to science in grades 1-6.
    a. PLO-1, 2, 4; MTS-2, 4, 5, 6, 7
    b. Assignments: A1, A3, B1, B2, B3, B5, B5, B6

4. Gain an increased awareness of **interdisciplinary connections** between science, language arts, mathematics, technology, health, physical education and society.
    a. PLO 1, 2, 4, 5 & 6; MTS-1, 3, 4, 7, 9
    b. Assignments: A1, A2, A3, B1, B2, B4, B6

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

1. Evaluate and utilize contemporary **science standards** and curriculum materials for science education.
    a. PLO 2, 5 & 6; MTS-1, 3, 7, 8
    b. Assignments A1, B1, B2, B4

2. Plan and implement a variety of **instructional strategies** and assessment techniques for teaching science at the elementary level.
    a. PLO 1, 2, 4, 5; MTS 1, 2, 4, 7
    b. Assignments A1, A3, B1, B2, B4

3. Create a positive **learning environment** that encourages science learning by modeling the attitudes and dispositions of scientific inquiry.
    a. PLO 1, 2, 3, 4; MTS 2, 3, 4, 5, 6
    b. Assignments A1, A2, A3, B1, B2, B3, B4, B5

4. Realize ethical, legal, and **safety issues** in teaching elementary science and use accepted science safety standards during all science investigations.
    a. PLO 1, 2, 3; MTS-1, 2, 5, 7
    b. Assignments A1, A2, A3, B1, B2, B4

5. Synthesize a comprehensive and **consistently Christian philosophy** of elementary science education based on the biblical worldview.
    a. PLO 1, 2, 3, 4; MTS-1, 2, 3, 4, 5, 6, 7, 9
    b. Assignments A2, B1, B2, B4, B6

I. MATERIALS

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

B. Required Textbooks

DeRosa, D. & Abruscato, J. *Teaching Children Science: A Discovery Approach,* 9th edition, Pearson, 2018. ISBN: 978-0134742878 E-book rental available for $43.96 through Pearson. Used copies available through Amazon for $94.

Kopp, Kathleen. *Teaching Science Today (Effective Teaching in Today's Classroom)*, 2nd edition, Shell Education, 2014. ISBN: 1425812090 (Retail: $29.75) Used copies also available.

C. Additional Reading

You will be expected to read additional material (handouts, journal articles, websites, etc.) that may be assigned by the instructor during the course.

D. **Websites**

- National Science Teachers Association https://www.nsta.org/
- Missouri Science Learning Standards https://dese.mo.gov/media/pdf/curr-mls-standards-sci-k-5-sboe-2016

IV. REQUIREMENTS

A. Weekly Assignments

1. Textbook Reading & Chapter Quizzes

Read the assigned textbook chapters according to the reading schedule provided in the Tentative Class Schedule. Reading the text thoroughly will provide a context for class discussion and activities. A quiz will be posted on CANAS to reinforce the main ideas and provide evidence of understanding. Students will be allowed to use the textbook as reference during the quiz.

To accomplish our learning goals, there will be activities and scenarios embedded in CANVAS and CENGAGE that you will complete while reading through the chapter. These will give you the opportunity to reflect on the concepts presented and demonstrate understanding of key concepts.

2. Discussion Questions

Discussion questions will be posted through CANVAS. Students are expected to respond with a 250-300 word response and respond to the reflections of two of their peers each week by midnight on Sunday. The purpose of this activity will be to engage with the other learners and hear other perspectives regarding concepts discussed in the lectures.

3. Reflection Responses

Read each chapter in the *Teaching Science Today* manual and respond to the reflection questions presented at the end of the chapter.

B. Assignments & Projects

1. Research-Based Lesson Teaching Experience

The student will select a lesson from the unit plan that includes a research project or formative assessment activity and teach it to our class. Further details will be provided on CANVAS for this assignment. Your lesson should only take 15-20 minutes to present.

- Submit your Lesson Plan on the Lesson Plan form received in class.
- Include any printed materials that you will use to teach the lesson.
- Provide a copy of your lesson plan and all materials before you teach each lesson.

2. STEM Day Teaching Experience

The students will prepare a STEM challenge activity and will facilitate the activity with local elementary school students. The lesson must be limited to 15-20 minutes. Students will submit both the lesson plan and a reflection statement with an evaluation of how the interaction with the students went and lessons learned.

- Include any printed materials that you will use to teach the lesson.
- Provide a copy of your lesson plan and all materials before you teach each lesson.

3. Technology Review: Science Sites & Virtual Field Trips

Identify 10 science websites or virtual field trips that connect with science that could be used in an elementary classroom to make the science topics more engaging. Students will spend a minimum of 15 minutes exploring each site and will complete an evaluation guide that analyzes the strengths and weaknesses of each site. Students should plan to include sites from a variety of science education topics that could include animals, plants, habitats, electricity, magnetism, space, sound, machines, etc. List the links and provide a brief description of the appropriate age level and topic. A template for this will be provided in CANVAS.

4. Science Unit Plan & Teaching Practice

See template provided on CANVAS. Include the following elements:

- Grade level & Science topic
- Select standards from MO Learning Standards to cover in the unit.
- Write out the learning objectives based on the **standards as "I Can" statements.**
- Include instructional plans that cover the 5 E method of science inquiry: Engage, Explore, Explain, Elaborate and Evaluate. Include Direct instruction, Small Group activities, and formative and summative assessment techniques.
- Scope and Sequence…what will be taught and when it will be taught
- **Create 3 detailed Daily Lesson Plans—1 to introduce the unit, 1 that includes formative assessment, and 1 that would include a research/report activity.**
- Differentiation: for English Language Learners, Learning Challenged, Academically Gifted/Talented, Physically Challenged, etc.
- Include integration: Biblical principles, writing, art, music, P.E., etc.
- Include one Activity or Learning center idea
- Include one Website or App to support the theme

5. Pinterest Portfolio Science Resources

Create a Pinterest board and share the link on Canvas. Organize your ideas with folders on the site. Include ideas that you will use in your future classroom:

- Bulletin boards, activity centers, apps and extensions, web quests or apps, simulations or games, and classroom visitors.
- Find 40 ideas and organize them within folders on Pinterest.
- Ideas should be organized by science topics which will be listed on CANVAS.

6. Connecting Literature & Science

Review 15 children's books connected to science topics. Locate at least 3 biographies about scientists, 3 Seymour Simon books, and 3 National Geographic readers. All books must be at a child's reading level. Do not include science experiment books or random science fact books. A template will be provided on CANVAS to summarize each book.

VI. METHODS

A. Teaching

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

B. Grading

1. Weight given to assignments:

Research Based Lesson Teaching Experience		100 points
STEM Experiment Demonstration		150 points
Science Sites & Virtual Field Trips		70 points
Science Unit Plan		150 points
Juvenile Science Literature Review		150 points
Pinterest Portfolio		50 points
Instructional Strategies Reading Reports		100 points
Chapter Quizzes	8 chapters x 10 points	80 points
Discussion posts	10 posts x 15 points	150 points
Weekly Participation in Class or Online		500 points
Total points for the class		1500 points

2. Late Assignments

Late assignments may be penalized 10 percent of the grade for that assignment.

3. Letter / Numerical Grade Scale

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

VII. COURSE POLICIES

Students in the Teacher Education Department at Calvary University are also to abide by the policies listed in the Educator Preparation Program Handbook.

A. Grade Requirements

Education majors must maintain a high standard for GPAs to successfully complete their program. Educations 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 (*paraphrase 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. Academic Activity & Participation

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 condition that may require support.

G. Style Guide

All class papers must follow the APA style guide according to *Publication Manual of the*

American Psychological Association, 7th edition.

H. The Clark Academic Center

The Clark Academic Center (learning@calvary.edu), located in the library building, is dedicated to providing free academic assistance for all Calvary University students. CAC assists with all facets of the writing process, tutors in various subject areas, prepares students for exams, facilitates with time management options and proctoring of 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	8/20 & 8/22	Inquiry: Thinking Like a Scientist Chapter 1	Assign: Weekly Readings Schedule & Overview of Syllabus & Projects
2	8/27 & 8/29	Becoming Scientifically Literate	
3	9/3 & 9/5	Science Practices & the Inquiry Process Chapter 2	
4	9/10 & 9/12	Science & Technology	Due: Technology Review: Science Sites & Virtual Field Trips
5	9/17 & 9/19	Integrating Science & Engineering Chapter 6	
6	9/24 & 9/26	Science & Math	Due: STEM Demonstrations
7	10/1 & 10/3	STEM Demonstrations with Elementary Students	
8	10/8 & 10/10	Creating Environments Chapter 4	Due: Pinterest Board Resources
	10/14 – 10/18	FALL BREAK—NO CLASSES	

9	10/22 & 10/24	Planning Units & Lessons in Science Chapter 3	
10	10/29 & 10/31	Exploring Nature as a Scientist	
11	11/5 & 11/7	Assessment in Science Instruction Chapter 5	
12	11/12 & 11/14	Science & Literacy	
13	11/19 & 11/21	Continuing as a Science Learner	Due: Connecting Literature & Science
14	11/26 & 11/28	Setting Up a Science Classroom Happy Thanksgiving—No class Thursday	
15	12/3 & 12/5	Student Teaching Demonstrations	Due: Unit Plan & Research-Based Teaching Demonstration
16	12/10 & 12/12	Instructional Strategies Wrap-Up	