



3301

**Math/Science Methods
For the Elementary Teacher
Spring 2015**

Instructor Information:

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Office Hours: Monday 5:00-6:00 p.m., Tuesday 10-11:00 a.m., Wednesday 3:30-4:30 p.m., Monday-Thursday 9:00 a.m. – 12:00 noon - Internet Office Hours/Student Teacher Observations.

Course Description:

A study of effective teaching practices to enhance delivery of Math/Science in the elementary grades K-6.

Class Sessions:

Monday 5:00-8:45 p.m. Teleconference/Split-Web. Del Rio 103, Eagle Pass B113, Uvalde Room B110

Course Requirements and Grading:

✓ Regular attendance and participation is required 10%

✓ TEXES Practice Test - 10%

✓ Midterm Exam - 10%

✓ Presentations - 10%

✓ Classroom Field Experience - 10%

✓ Lesson Plans - 10%

✓ Evidence of Learning

 Binder & Oral Defense - 10%

A = 90-100%

B = 80-89%

C = 70-79%

D = 60-69%

F = 59 and ↓

Total of 100%

Program Learning Outcomes

The learner will:

1. Construct lesson plans following the Madeline Hunter lesson cycle. TEKS and objectives, alongside PPR Standards will be included in the lesson plans.
Assessment: Presentations, Lesson Plans
2. Utilize instructional technological resources to enhance student learning.
Assessment: Presentations
3. Review responsibilities related to the STAAR standardized assessment.
Assessment: Classroom Discussions, Presentations
4. Identify the range of individual developmental differences and how to differentiate instruction for students in early childhood through grade 6.
Assessment: Videos, Presentations, Lesson Plans
5. Become familiar with and keep documentation of the math and science TEKS, grades K-6. The learner will keep an organized system of file folders for the different lessons presented and will be able to orally explain the purpose of the different TEKS.
Assessment: File Folders/binder, Oral Defense
6. Make a group presentation in both math and science, which will be graded utilizing a rubric. This lesson will be presented to fellow classmates, and will include visuals, demonstrations, and activities as to how to teach concepts.
Assessment: Presentations, Class Discussion, Exam
7. View videos in class that demonstrate best practices of teachers teaching math and science lessons via a virtual classroom format. Students will turn in a notebook summarizing their learning experience.
Assessment: Videos, Field Experience, Notebook
8. Review competencies and domains in the Math and Science areas on the Generalist exam. In addition, the learner will take a pre and a post-Generalist practice exam that will provide them with feedback as to areas that may need remediation.
Assessment: Practice Generalist exam
9. Take part in a 5 hour field experience that exposes them to actual teaching.
Assessment: Field Experience

Evaluation:

The learner will be evaluated utilizing the following methods in order to ensure that the learning outcomes are being addressed: The learner will make a small group classroom presentation over both a Math and Science lesson. Classroom discussions will follow these presentations and these presentations will be graded using a rubric. Additionally, the learner will write lesson plans in both Math and Science. Also, the learner will participate in a 5 hour field experience alongside with viewing videos of master teaching. Submission of written summaries and a reflection paper will be required. A midterm exam that focuses on utilizing TEKS and writing lesson plans will be administered. An individual oral defense exam will take place at the end of the semester with file folders/binder turned in. Students will take practice Generalist Exams at the beginning and end of the semester.

TEXES Standards

Generalist EC-6 Standards

Math Standards:

Standard VII. Mathematical Learning and Instruction: The mathematics teacher understands how children learn and develop mathematical skills, procedures, and concepts; knows typical errors students make; and uses this knowledge to plan, organize, and implement instruction; to meet curriculum goals; and to teach all students to understand and use mathematics.

Standard VIII. Mathematical Assessment: The mathematics teacher understands assessment and uses a variety of formal and informal assessment techniques appropriate to the learner on an ongoing basis to monitor and guide instruction and to evaluate and report student progress.

Standard IX. Professional Development: The mathematics teacher understands mathematics teaching as a profession, knows the value and rewards of being a reflective practitioner, and realizes the importance of making a lifelong commitment to professional growth and development.

Science Standards:

Standard VIII. The science teacher knows and understands the science content appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in physical science.

Standard IX. The science teacher knows and understands the science content appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in life science.

Standard X. The science teacher knows and understands the science content appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in Earth and space science.

**Pedagogical and Professional Responsibilities (PPR)
Standards (EC-Grade 12)**

Standard 1. The teacher designs instruction appropriate for all students that reflects an understanding of relevant content and is based on continuous and appropriate assessment

<p>Teacher Knowledge: What Teachers Know Teachers of Students in Grades EC-12</p> <p><i>The beginning teacher knows and understands:</i></p>	<p>Application: What Teachers Can Do Teachers in Grades EC-12</p> <p><i>The beginning teacher is able to:</i></p>
<p>Students</p> <p>1.11k appropriate strategies for instructing English language learners.</p>	<p>Students</p> <p>1.11a plan lessons that reflect an understanding of students' developmental characteristics and needs;</p> <p>1.11b adapt lessons to address students varied backgrounds, skills, interests, and learning needs, including the needs of English language learners.</p>
<p>Content and Pedagogy</p> <p>1.12k the importance of the state system and performance standards as outlined in the Texas Essential Knowledge and Skills (TEKS);</p> <p>1.12b the significance of the vertical alignment of content, including prerequisite knowledge and skills;</p> <p>1.11k current research on best pedagogical practices.</p>	<p>Content and Pedagogy</p> <p>1.12a use the Texas Essential Knowledge and Skills (TEKS) to plan instruction;</p> <p>1.12b plan instruction that reflects an understanding of important prerequisite relationships;</p> <p>1.11a use a variety of pedagogical techniques to convey information and teach skills.</p>
<p>Selection of Instructional Goals and Objectives</p> <p>1.12a the importance of developing instructional goals and objectives that are clear, relevant, meaningful, and age-appropriate;</p> <p>1.12b the importance of developing instructional goals and objectives that can be assessed;</p> <p>1.12c the importance of developing instructional goals and objectives that are suitable for students with varied learning needs; and</p> <p>1.12d the importance of aligning instructional goals with campus and district goals.</p>	<p>Selection of Instructional Goals and Objectives</p> <p>1.12a develop instructional goals and objectives that are clear, relevant, meaningful, and age-appropriate;</p> <p>1.12b develop instructional goals and objectives that are able to be assessed;</p> <p>1.12c develop instructional goals and objectives that reflect students' age, developmental level, prior skills, and knowledge, background, and interests; and</p> <p>1.12d develop instructional goals and objectives that reflect different types of student learning and skills.</p>
<p>Resources</p> <p>1.16a the use of appropriate materials and resources for preparing instruction, presenting lessons, and</p>	<p>Resources</p> <p>1.16a use various types of materials and other resources to aid in preparing and implementing</p>

<p>assessing learning:</p>	<p>instruction.</p>
<p>Designing Coherent Instruction</p> <p>I.19k the importance of designing instruction that reflects the TEKS;</p> <p>I.21k the importance of planning lessons and structuring units so that activities progress in a logical sequence;</p> <p>I.24k the importance of engaging in continuous monitoring and self-assessment of instructional effectiveness.</p>	<p>Designing Coherent Instruction</p> <p>I.19s plan instructional activities that progress sequentially and support stated instructional goals based on the TEKS;</p> <p>I.20s select instructional resources that support instructional goals, enhance student achievement, and engage students in learning;</p> <p>I.21s use varied activities and instructional groupings to engage students in instructional content and meet instructional goals and objectives;</p> <p>I.23s provide students with opportunities to explore content from many perspectives.</p>
<p>Assessment of Student Learning</p> <p>I.25k the role of assessment in guiding instructional planning;</p> <p>I.26k the importance of creating assessments that are congruent with instructional goals and objectives;</p> <p>I.30k the connection between the Texas statewide assessment program, the TEKS, and instruction.</p>	<p>Assessment of Student Learning</p> <p>I.24s use a variety of assessment methods, including technology, that are appropriate for evaluating student achievement of instructional goals and objectives;</p> <p>I.25s communicate assessment criteria and standards to students;</p> <p>I.26s design assessments, where appropriate, that reflect real-world applications of knowledge and understanding;</p> <p>I.27s promote students' use of self-monitoring and self-assessment.</p>

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

<p>Teacher Knowledge: What Teachers Know Teachers of Students in Grades EC-12</p> <p><i>The beginning teacher knows and understands:</i></p>	<p>Application: What Teachers Can Do Teachers in Grades EC-12</p> <p><i>The beginning teacher is able to:</i></p>
<p>Establishing an Environment for Learning and Excellence</p> <p>2.0k the importance of communicating enthusiasm for learning; and</p> <p>2.02 the necessity of communicating teacher expectations for student learning.</p>	<p>Establishing an Environment for Learning and Excellence</p> <p>2.4s communicate to all students the importance of instructional content and the expectation of high-quality work; and</p> <p>2.5s ensure that instructional goals and objectives, activities, classroom interactions, assessments, and other elements of the classroom environment convey high expectations for student achievement.</p>

Standard 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.

<p>Communication</p> <p>2.1K the importance of clear, accurate communication in the teaching and learning process;</p> <p>3.2K principles and strategies for communicating effectively in varied teaching and learning contexts;</p> <p>3.3K spoken and written language that is appropriate to students' ages, interests, and backgrounds; and</p> <p>4.4K skills and strategies for engaging in skilled questioning and leading effective student discussions.</p>	<p>Communication</p> <p>3.1E communicate directions, explanations, and procedures clearly, accurately, and with an appropriate level of detail, both orally and in writing;</p> <p>3.2E use effective interpersonal skills (including both verbal and nonverbal skills) to reach students and communicate the teacher's commitment to students;</p> <p>3.3E use spoken and written language that is appropriate to students' ages, interests, and backgrounds;</p> <p>3.4E use effective communication techniques, including questioning and discussion techniques, to foster active student inquiry, higher-order thinking, problem solving, and productive, supportive interactions;</p> <p>3.5E use carefully framed questions to enable students to reflect on their understanding of content and to consider new possibilities; and</p> <p>3.6E apply skills for leading discussions that engage all students in exploring important questions and that extend students' knowledge.</p>
<p>Engaging Students in Learning</p> <p>4.5K criteria for selecting appropriate instructional activities and assignments for students with varied characteristics and needs;</p> <p>5.1K techniques for structuring and pacing lessons in ways that promote student engagement and learning.</p>	<p>Engaging Students in Learning</p> <p>3.7E engage lessons with a clearly defined structure around which activities are organized;</p> <p>3.8E create activities and assignments that are appropriate for students and that actively engage them in the learning process;</p> <p>5.2E select and use instructional materials, resources, and technologies that are suitable for instructional goals and that engage students cognitively;</p> <p>4.1E engage students intellectually by teaching meaningful content in ways that promote all students' active and invested participation in the learning process; and</p> <p>4.1E encourage students' self-direction and active engagement in learning.</p>

Course Outline

Pedagogy

(TEXES PPR Standards: 1.6k, 1.1s, 1.2s, 1.7k, 1.9k, 1.11k, 1.6s, 1.9s, 1.11s)

- Implementation of TEKS in math/science lesson
- Relationship to prior/future learning
- Content sequence
- Instruction serving English Language Learners

Designing Instruction

(TEXES PPR Standards: 1.12k-1.16k, 1.12s-1.16s, 1.19k, 1.21k, 1.24k, 1.19s-1.12s)

- Development of instructional goals and objectives
- Utilize content sequence
- Develop goals that are measurable and can be assessed

Assessing Student Learning

(TEXES PPR Standards: 1.25k, 1.26k, 1.30k, 1.24s-1.27s)

- Monitor student learning and provide feedback
- Monitor lesson presentation and connect with original instructional goals and objectives and with the STAAR exam.

Meeting Students' Academic Needs

(2.4k, 2.5k, 2.4s, 2.5s, 3.1k-3.4k, 3.1s-3.6s, 3.5k, 3.11k, 3.7s-3.9s, 3.13s, 3.14s)

- Engaged learning
- Teacher expectations
- Clear administrative directions
- Relates instruction to interests and emphasizes value/importance
- Provides enrichment/extension

TENTATIVE SCHEDULE

<u>Date</u>	<u>Assignment</u>
<u>January 26</u>	<u>Introductions/Syllabus/Course Description, Expectations</u> <u>Math Concepts: Mathematical Development Video</u>
<u>February 2</u>	<u>Vocabulary & Writing Strategies/Math Learning Video</u> <u>Grades 1-2</u> <u>Vocabulary & Writing Strategies/Math Learning Video</u> <u>Grades 3-6</u>
<u>February 9</u>	<u>TEKS, Math Lesson Plans</u>
<u>February 16</u>	<u>Math Presentations Grades K-2</u>
<u>February 23</u>	<u>Math Presentations Grades K-2</u>
<u>March 2</u>	<u>Math Presentations Grades 3-6</u>
<u>March 9</u>	<u>MIDTERM, TEXES Practice Exam</u>
<u>March 16-20</u>	<u>Spring Break</u>
<u>March 23</u>	<u>Math Presentations Grades 3-6</u>
<u>March 30</u>	<u>Science Presentations K-2</u>
<u>April 6</u>	<u>Science Presentations K-2</u> <u>Field Experience Due</u>
<u>April 13</u>	<u>Science Presentations 3-6</u>
<u>April 20</u>	<u>Science Presentations 3-6</u>
<u>April 27</u>	<u>Portfolio Oral Defense Conference-Del Rio students</u>
<u>May 4</u>	<u>Portfolio Oral Defense Conference-Eagle Pass students</u>

ASSIGNMENTS AND REQUIREMENTS

Attendance and Participation: 10%

All students are expected to attend class regularly and be on time. Absences and tardies will result in a loss of points. Also, students are expected to participate in class discussions and class activities. The format of the class will be lecture, discussion, group activities, role-playing and presentations. Failure to participate will result in a loss of points.

Exam: 10%

There will be a Midterm exam worth 10%. The exam will consist of short answer and/or essay questions. You will have 1 hour and 45 minutes to complete the exam. Part I consists of 4 essay questions worth 10 pts. each. For Part II, you will be given math TEKS and will need to come up with a lesson plan, incorporating all of the steps of the Madeline Hunter Lesson Plan format.

TEXES Practice Tests: 10%

You will be required to take the TEXES Generalist Practice Test.

Classroom Field Experience: 10%

During the semester, you will need to complete 5 hours of classroom field experience. **For full credit, you must experience a minimum of 5 hours of classroom teaching and interaction.**

You will need to keep a Classroom Field Based Experience Journal. After every field experience (5), you will type a one page summary of your observations and experience. Summarize what you observed and reflect on how viewing an actual teacher can help you as a future teacher. After the 5 hours of actual field experience, type a two-page reflection detailing your experience. Your typed journal pages and typed two-page reflection will need to be turned in on **April 6, 2015**. Please note that this journal will also be graded on how visually appealing it is. A log with dates, times and teacher signatures will also need to be submitted at the same time as the journal.

Presentations: 10%

Students will work on presentations related to math and science. All students must have a speaking part during the presentation. Lessons will be presented to classmates and presentations will be graded utilizing a rubric. You will be required to post PowerPoint presentations, as well as handouts to the Discussion Board, when it is your turn to present. All others need to print out the handouts and bring to class, as well as **bring necessary materials that are required to complete the activity.**

Lesson Plans: 10%

Students will be expected to type up lesson plans and turn in at least one day prior to presenting their lesson. Lesson Plans will be graded utilizing a rubric. Lesson Plans must be turned in the day prior to presenting for full credit. The Lesson Plans will be deducted if they are submitted on the day of the presentation.

Evidence of Learning: 10%

You will need to keep a binder with dividers for each of the different math and science lessons taught in this class by you and by your peers. You will be asked to orally discuss what you learned/experienced by being exposed to the lessons presented.

Disability Statement Learning

No person shall be excluded from participation in, denied the benefits of, or be subject to discrimination under any program or activity sponsored by Sul Ross State University on any basis prohibited by applicable law, including, but not limited to race, color, national origin, religion, sex, age, or disability.

Distance Education Statement:

Students enrolled in distance education courses have equal access to the university's academic support services, library resources, and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should submit online assignments through Blackboard or SRSU email, which require secure login information to verify students' identities and to protect students' information. *(If the course requires students to take proctored exams or to purchase additional software or equipment, please describe those requirements here.)* The procedures for filing a student complaint are included in the student handbook. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website.