

EDUC 3301

Math/Science Methods

For the Elementary Teacher

Spring 2022

Instructor Information:

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Course Description:

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

Class Sessions:

Online, Web-delivered

Course Requirements and Grading:

- | | |
|---|--------------|
| ✓ Professionalism, Participation and Timely Assignment Submission - 10% | A = 90-100% |
| | B = 80-89% |
| | C = 70-79% |
| ✓ Final Exam –10% | D = 60-69% |
| ✓ Presentations – 35% | F = 59 and ↓ |
| ✓ Lesson Plans – 10% | |
| ✓ Blackboard – 35% | |

Total of 100%

Student 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: Online Presentations, Lesson Plans, Exam
2. Utilize instructional technological resources to enhance student learning.
Assessment: Online Presentations
3. Review responsibilities related to the STAAR standardized assessment.
Assessment: Blackboard, Online Presentations, Lesson Plans
4. Identify the range of individual developmental differences and how to differentiate instruction for students in early childhood through grade 6.
Assessment: Online Presentations, Lesson Plans, Exam
5. Make a presentation in both math and science, which will be graded utilizing a rubric. This lesson will be posted online via Blackboard to fellow classmates, and will include visuals, demonstrations, and activities as to how to teach concepts.
Assessment: Online Presentations, Discussion Board, Exam, Lesson Plans
6. Review competencies and domains in the Math and Science areas on the Core Content exams.
Assessment: Preparation Manuals in Math and Science, Exam
7. Become familiar with TExES objectives in Math and Science. Study how they build on each other from one grade to the next.
Assessment: www.tea.texas.gov, Exam

BA Interdisciplinary Studies (SLOs, Marketable Skills, & Dissemination Plan)

Student Learning Outcomes

1. BA Interdisciplinary Studies: SLO 1- Students will observe and identify the range of individual developmental differences that characterize students in early childhood through grade 8 (EDUC 3304).
2. BA Interdisciplinary Studies: SLO - 2 Students will identify instructional strategies to analyze children's strengths and needs for planning instruction.
3. BA Interdisciplinary Studies SLO - 3 Students will identify and select pertinent materials and resources including technological resources to enhance student learning and engagement in the planning process.

Marketable Skills

1. Students have the ability to understand human growth and development.
2. Students have the ability to recognize the influence of diverse social-cultural factors.
3. Student have the skills to utilize multiple methods and strategies to achieve a goal.
4. Students have the skills to effectively use technology.

Dissemination Plan

1. Instructors will include the marketable skills in course syllabi
2. Instructors will include assignments in writing and speaking so student will demonstrate these skills throughout the semester.
3. Instructors will discuss the four marketable skills with students to assure that they understand and can demonstrate each of them.

SACSCOC—Accreditation

Student Learning Outcomes

SLO 1—Students will identify range of individual developmental differences that characterize student in early childhood through grade 6.

SLO 2—Students will identify assessments to analyze children’s strength and needs for planning instruction.

SLO 3—Students will identify and select pertinent materials and resources including technological resources to enhance students learning and engagement in the planning process.

Evaluation:

The learner will be evaluated utilizing the following methods in order to ensure that the learning outcomes are being addressed: The learner will post a lesson presentation over both a Math and Science lesson. Additionally, the learner will write lesson plans in both Math and Science related to the lesson presentation. Both the online presentation as well as the lesson plan will be graded utilizing a rubric. Also, Discussion Board assignments will follow these online presentations. A final exam that focuses on utilizing TEKS and writing lesson plans will be administered.

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.

TEXES Standards

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

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

Teacher Knowledge: What Teachers Know Teachers of Students in Grades EC-12 <i>The beginning teacher knows and understands:</i>	Application: What Teachers Can Do Teachers in Grades EC-12 <i>The beginning teacher is able to:</i>
<p>Students</p> <p>1.6k appropriate strategies for instructing English language learners.</p>	<p>Students</p> <p>1.1s plan lessons that reflect an understanding of students' developmental characteristics and needs;</p> <p>1.2s 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>1.7k the importance of the state content and performance standards as outlined in the Texas Essential Knowledge and Skills (TEKS);</p> <p>1.9k 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>1.6s use the Texas Essential Knowledge and Skills (TEKS) to plan instruction</p> <p>1.9s plan instruction that reflects an understanding of important prerequisite relationships;</p> <p>1.11s use a variety of pedagogical techniques to convey information and teach skills.</p>
<p>Selection of Instructional Goals and Objectives</p> <p>1.12k the importance of developing instructional goals and objectives that are clear, relevant, meaningful, and age-appropriate;</p> <p>1.13k the importance of developing instructional goals and objectives that can be assessed;</p> <p>1.14k the importance of developing instructional goals and objectives that are suitable for students with varied learning needs; and</p> <p>1.15k the importance of aligning instructional goals with campus and district goals.</p>	<p>Selection of Instructional Goals and Objectives</p> <p>1.12s develop instructional goals and objectives that are clear, relevant, meaningful, and age-appropriate;</p> <p>1.13s develop instructional goals and objectives that are able to be assessed;</p> <p>1.14s develop instructional goals and objectives that reflect students' age, developmental level, prior skills and knowledge, background, and interests; and</p> <p>1.15s develop instructional goals and objectives that reflect different types of student learning and skills.</p>
<p>Resources</p> <p>1.16k the use of appropriate materials and resources for preparing instruction, presenting lessons, and</p>	<p>Resources</p> <p>1.16s use various types of materials and other resources to aid in preparing and implementing</p>

<p>assessing learning.</p> <p>1.17 k the importance of knowing when to integrate technology into instruction and assessment; and</p> <p>1.18k the use of resources beyond the campus to help students meet academic and nonacademic needs.</p>	<p>instruction.</p> <p>1.17s use technological tools to promote learning and expand instructional options; and</p> <p>1.18s use resources available outside the school (e.g., museums, businesses, community members to enhance students' learning opportunities.</p>
<p>Designing Coherent Instruction</p> <p>1.19k the importance of designing instruction that reflects the TEKS;</p> <p>1.20k features of instruction that maximize students' thinking skills;</p> <p>1.21k the importance of planning lessons and structuring units so that activities progress in a logical sequence;</p> <p>1.22k how materials, technology, and other resources may be used to support instructional goals and objectives and engage students in meaningful learning;</p> <p>1.23k the benefits of designing instruction that integrates content across disciplines;</p> <p>1.24k the importance of engaging in continuous monitoring and self-assessment of instructional effectiveness.</p>	<p>Designing Coherent Instruction</p> <p>1.19s plan instructional activities that progress sequentially and support stated instructional goals based on the TEKS;</p> <p>1.20s select instructional resources that support instructional goals, enhance student achievement, and engage students in learning;</p> <p>1.21s use varied activities and instructional groupings to engage students in instructional content and meet instructional goals and objectives;</p> <p>1.22s allocate time appropriately within lessons and units, including providing adequate opportunities for students to engage in reflection and closure; and prospective</p> <p>1.23s provide students with opportunities to explore content from many perspectives.</p>
<p>Assessment of Student Learning</p> <p>1.25k the role of assessment in guiding instructional planning;</p> <p>1.26k the importance of creating assessments that are congruent with instructional goals and objectives;</p> <p>1.30k the connection between the Texas statewide assessment program, the TEKS, and instruction.</p>	<p>Assessment of Student Learning</p> <p>1.24s use a variety of assessment methods, including technology, that are appropriate for evaluating student achievement of instructional goals and objectives;</p> <p>1.25s communicate assessment criteria and standards to students;</p> <p>1.26s design assessments, where appropriate, that reflect real-world applications of knowledge and understanding;</p> <p>1.27s 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>2.4k the importance of communicating enthusiasm for learning; and</p> <p>2.5k 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>3.1k 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>3.4k skills and strategies for engaging in skilled questioning and leading effective student discussions.</p>	<p>Communication</p> <p>3.1s communicate directions, explanations, and procedures clearly, accurately, and with an appropriate level of detail, both orally and in writing;</p> <p>3.2s use effective interpersonal skills (including both verbal and nonverbal skills) to reach students and communicate the teacher's commitment to students;</p> <p>3.3s use spoken and written language that is appropriate to students' ages, interests, and backgrounds;</p> <p>3.4s 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>3.5s use carefully framed questions to enable students to reflect on their understanding of content and to consider new possibilities; and</p> <p>3.6s 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>3.5k criteria for selecting appropriate instructional activities and assignments for students with varied characteristics and needs;</p> <p>3.11k techniques for structuring and pacing lessons in ways that promote student engagement and learning.</p>	<p>Engaging Students in Learning</p> <p>3.7s create lessons with a clearly defined structure around which activities are organized;</p> <p>3.8s create activities and assignments that are appropriate for students and that actively engage them in the learning process;</p> <p>3.9s select and use instructional materials, resources, and technologies that are suitable for instructional goals and that engage students cognitively;</p> <p>3.13s engage students intellectually by teaching meaningful content in ways that promote all students' active and invested participation in the learning process; and</p> <p>3.14s encourage students' self-motivation and active engagement in learning.</p>

Texas Administrative Code

[TITLE 19](#)

EDUCATION

[PART 7](#)

STATE BOARD FOR EDUCATOR CERTIFICATION

[CHAPTER 247](#)

EDUCATORS' CODE OF ETHICS

RULE §247.2

Code of Ethics and Standard Practices for Texas Educators

Enforceable Standards.

(1) **Professional Ethical Conduct, Practices and Performance.**

(A) Standard 1.1. The educator shall not intentionally, knowingly, or recklessly engage in deceptive practices regarding official policies of the school district, educational institution, educator preparation program, the Texas Education Agency, or the State Board for Educator Certification (SBEC) and its certification process.

(B) Standard 1.2. The educator shall not knowingly misappropriate, divert, or use monies, personnel, property, or equipment committed to his or her charge for personal gain or advantage.

(C) Standard 1.3. The educator shall not submit fraudulent requests for reimbursement, expenses, or pay.

(D) Standard 1.4. The educator shall not use institutional or professional privileges for personal or partisan advantage.

(E) Standard 1.5. The educator shall neither accept nor offer gratuities, gifts, or favors that impair professional judgment or to obtain special advantage. This standard shall not restrict the acceptance of gifts or tokens offered and accepted openly from students, parents of students, or other persons or organizations in recognition or appreciation of service.

(F) Standard 1.6. The educator shall not falsify records, or direct or coerce others to do so.

(G) Standard 1.7. The educator shall comply with state regulations, written local school board policies, and other state and federal laws.

(H) Standard 1.8. The educator shall apply for, accept, offer, or assign a position or a responsibility on the basis of professional qualifications.

(I) Standard 1.9. The educator shall not make threats of violence against school district employees, school board members, students, or parents of students.

(J) Standard 1.10. The educator shall be of good moral character and be worthy to instruct or supervise the youth of this state.

(K) Standard 1.11. The educator shall not intentionally or knowingly misrepresent his or her employment history, criminal history, and/or disciplinary record when applying for subsequent employment.

(L) Standard 1.12. The educator shall refrain from the illegal use or distribution of controlled substances and/or abuse of prescription drugs and toxic inhalants.

(M) Standard 1.13. The educator shall not be under the influence of alcohol or consume alcoholic beverages on school property or during school activities when students are present.

(N) Standard 1.14. The educator shall not assist another educator, school employee, contractor, or agent in obtaining a new job as an educator or in a school, apart from the routine transmission of administrative and personnel files, if the educator knows or has probable cause to believe that such person engaged in sexual misconduct regarding a minor or student in violation of the law.

(2) **Ethical Conduct Toward Professional Colleagues.**

(A) Standard 2.1. The educator shall not reveal confidential health or personnel information concerning colleagues unless disclosure serves lawful professional purposes

or is required by law.

(B) Standard 2.2. The educator shall not harm others by knowingly making false statements about a colleague or the school system.

(C) Standard 2.3. The educator shall adhere to written local school board policies and state and federal laws regarding the hiring, evaluation, and dismissal of personnel.

(D) Standard 2.4. The educator shall not interfere with a colleague's exercise of political, professional, or citizenship rights and responsibilities.

(E) Standard 2.5. The educator shall not discriminate against or coerce a colleague on the basis of race, color, religion, national origin, age, gender, disability, family status, or sexual orientation.

(F) Standard 2.6. The educator shall not use coercive means or promise of special treatment in order to influence professional decisions or colleagues.

(G) Standard 2.7. The educator shall not retaliate against any individual who has filed a complaint with the SBEC or who provides information for a disciplinary investigation or proceeding under this chapter.

(3) Ethical Conduct Toward Students.

(A) Standard 3.1. The educator shall not reveal confidential information concerning students unless disclosure serves lawful professional purposes or is required by law.

(B) Standard 3.2. The educator shall not intentionally, knowingly, or recklessly treat a student or minor in a manner that adversely affects or endangers the learning, physical health, mental health, or safety of the student or minor.

(C) Standard 3.3. The educator shall not intentionally, knowingly, or recklessly misrepresent facts regarding a student.

(D) Standard 3.4. The educator shall not exclude a student from participation in a program, deny benefits to a student, or grant an advantage to a student on the basis of race, color, gender, disability, national origin, religion, family status, or sexual orientation.

(E) Standard 3.5. The educator shall not intentionally, knowingly, or recklessly engage in physical mistreatment, neglect, or abuse of a student or minor.

(F) Standard 3.6. The educator shall not solicit or engage in sexual conduct or a romantic relationship with a student or minor.

(G) Standard 3.7. The educator shall not furnish alcohol or illegal/unauthorized drugs to any person under 21 years of age unless the educator is a parent or guardian of that child or knowingly allow any person under 21 years of age unless the educator is a parent or guardian of that child to consume alcohol or illegal/unauthorized drugs in the presence of the educator.

(H) Standard 3.8. The educator shall maintain appropriate professional educator-student relationships and boundaries based on a reasonably prudent educator standard.

(I) Standard 3.9. The educator shall refrain from inappropriate communication with a student or minor, including, but not limited to, electronic communication such as cell phone, text messaging, email, instant messaging, blogging, or other social network communication. Factors that may be considered in assessing whether the communication is inappropriate include, but are not limited to:

(i) the nature, purpose, timing, and amount of the communication;

(ii) the subject matter of the communication;

(iii) whether the communication was made openly or the educator attempted to conceal the communication;

(iv) whether the communication could be reasonably interpreted as soliciting sexual contact or a romantic relationship;

(v) whether the communication was sexually explicit; and

(vi) whether the communication involved discussion(s) of the physical or sexual attractiveness or the sexual history, activities, preferences, or fantasies of either the educator or the student.

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>
January 10	Introductions/Syllabus- Course Description and Expectations
January 16	Discussion Board Due
January 17	MLK HOLIDAY
January 24	Review Preparation Manuals – Core Subjects exam, either K-6 or 4-8, or your subject matter if secondary
January 30	Discussion Board Due
January 31 February 6	Review the Educator Code of Ethics Discussion Board Due
February 7 February 13	Review TEKS in Math and Science- www.tea.texas.gov Discussion Board Due
February 14 February 20	Review Lesson Plan and Presentation Rubrics Discussion Board Due
February 21 February 27	Math Presentations Grades K-2 Discussion Board Due
February 28 March 6	Math Presentations Grades K-2 Discussion Board Due
March 7 March 13	Math Presentations Grades K-2 Discussion Board Due
March 14 March 20	Math Presentations Grades K-2 Discussion Board Due
March 21-25	Spring Break
March 28 April 3	Science Presentations Grade 6 Discussion Board Due
April 4 April 10	Science Presentations Grade 6 Discussion Board Due
April 11 April 17	Science Presentations Grade 6 Discussion Board Due

April 18
April 24

Science Presentations Grade 6
Discussion Board Due

April 25

Exam - Online

ASSIGNMENTS AND REQUIREMENTS

Professionalism, Attendance and Online Participation: 10%

All students are expected to attend to their assignments on a weekly basis. Demonstration of professionalism is expected in the field of education, as well as in this class.

Exam: 10%

There will be a Final exam worth 10%. The exam will consist of short answer and/or essay questions. You will have 2 hours to complete the exam. Part I consists of 6 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 the steps of the Madeline Hunter Lesson Plan format

PowerPoint Presentations: 35%

Students will independently work on presentations related to math and science. I will post a list with names and due dates once late registration is over. Lesson presentations will be posted online and will be graded utilizing a rubric. You will be required to post Lesson Plans, PowerPoint presentations, as well as handouts and materials needed to Discussion Board, when it is your turn to post your lesson. Those assigned to complete the lesson will need to have necessary materials that are required to enact the lesson as well as complete the activity that is included in the lesson.

Lesson Plans: 10%

Students will be expected to type up lesson plans and turn in prior to presenting their lesson. The lesson plan will be **Due on the Sunday before the Monday** that the lesson presentation is due. Example: If Linda's Lesson Plan PowerPoint Presentation is due on Monday February 21, then the Lesson Plan needs to be posted on Sunday, February 20 by noon!
Lesson Plans will be graded utilizing a rubric.

Why Lesson Plans are due on the Sunday before the PowerPoint Presentation is due – I will be grading each assignment independently. So, I will utilize the rubric to grade the lesson plans before I ever see the Presentations. Then I will use the presentation rubric to grade the Presentation. Both rubrics are very similar, however Lesson Plans and Presentations are graded independently of each other.

Blackboard: 35%

The utilization of Blackboard will be an important component of this course. Blackboard Discussion Board assignments will be due on a weekly basis. Assignments will be posted on Mondays and will be due on **Sundays at midnight**.

Required by American with Disabilities Act

For RGC:

SRSU Disability Services. Sul Ross State University (SRSU) is committed to equal access in compliance with Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. RGC students seeking accessibility services should contact Paulette Harris, Executive Assistant to the Vice President and Dean, at 830-279-3023 or email pharris@sulross.edu. Ms. Harris's office is at 2623 Garner Field Road, Uvalde, TX 78801 (this is the mailing address, too).

For Remote/Online Courses Only - SRSU Distance Education Statement.

Students enrolled in distance education courses have equal access to the university's academic support services, such as library resources, online databases, and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should correspond using Sul Ross email accounts and submit online assignments through Blackboard, which requires secure login. 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. Directions for filing a student complaint are located in the student handbook.