EDT 3371: EDUCATIONAL TECHNOLOGY (ONLINE)

CRN: 29668
Credit: 3
Spring 2022

Instructor info:
Yi-Yu Liao, Ph.D.
/ee yoo lee-ow/
(She/Her/Ella)
yliao2@utep.edu

Office Hours: Virtually via Zoom Wednesdays, 8:20 to 10:30 pm (MT)

INSTRUCTIONAL METHOD
This section will be delivered 100% online. Students will not be required to meet on specific days or times.

COURSE INFORMATION

Course Description
This course covers the fundamentals of educational technologies that support teaching and learning, including terminology, historical development, learning theories, social impacts, and ethical implications. It focuses on building proficiency in the application of technologies that improve communication and collaboration within schools. Students will examine and evaluate educational technologies in relation to national and state standards, with an emphasis on integrating technology into teaching with the goal of promoting children's digital literacy and learning across academic content areas.

Course Objectives and Learning Outcomes
At a minimum, by the end of the class the participating students should be able to achieve the following course objectives, as prescribed by 19 TAC 228.30 (c)(8) and TEC 21.0452 (b)(5) in alignment with the latest version of the International Society for Technology in Education's (ISTE) standards as appears on the ISTE website (additional course objectives that will be covered time permitting are included in Appendix A and B):

1. Will have learned to assess their degree of digital literacy and identified resources to address any deficiencies identified by the digital literacy evaluation.

2. Will have learned to integrate technology effectively into curricula and instruction, including activities consistent with the principles of universal design for learning.

3. Will have learned to use technology effectively to collect, manage, and analyze data to improve teaching and learning for the purpose of increasing student academic achievement.
4. Will have learned to continually improve their practice by learning from and with others and exploring proven and promising practices that leverage technology to improve student learning.

5. Will have learned to seek out opportunities for leadership to support student empowerment and success and to improve teaching and learning.

6. Will have learned to inspire students to positively contribute to and responsibly participate in the digital world.

7. Will have learned to dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems.

8. Will have learned to design authentic, learner-driven activities and environments that recognize and accommodate learner variability.

9. Will have learned to facilitate learning with technology to support student achievement of the ISTE Standards for Students.

10. Will have learned to understand and use data to drive their instruction and support students in achieving their learning goals.

*Note: Course objectives #4-10 from the ISTE Standards for Educators, Third Edition, 2016 ISTE (International society for Technology in Education), https://www.iste.org/standards/for-educators

Required Materials
There is no required textbook for this course. All course materials will be posted on Blackboard for you to download. You should read the required readings and prepare for discussion online. Links to multimedia materials will also be provided.

Course Assignments
This course assignments include, but are not limited to, weekly module of coursework activities—Discussion Board (DB), Educational Technology Blog (ETB), and Educational Technology Journal (ETJ). At the end of the semester, you will have a final project and a final exam.

Discussion Board (DB): Discussion board in an online forum to promote a thread conversation about course concepts. You are expected to create your own discussions and participate in existing ones.

*Learn more about DB: Click here.

Ed Tech Blog (ETB): A blog is your personal online platform to express your ideas and share information with the class.
Ed Tech Journal (ETJ): The journal provides a personal space for you to communicate **publicly** with the class. You can post personal reflections on course topics and/or experiences. **Anyone** can see the entries and **only faculty** can comment.

**My Self-Assessments:** The journal of my self-assessments provides a personal space for you to communicate **privately** with your instructor. You can post personal reflections on course topics and/or experiences. **Only** the individual student can add entries and **only faculty** can comment.

**Final project:** The final project will be a portfolio representing a culmination of the work you did in the coursework activities. So long as you complete all of the coursework on time and meeting all criteria then you should not have any difficulties with the final project. The final project will include several components, all of which will be submitted via a Final Project near the end of the semester.

**Final exam:** At the end of the course, a final exam will be conducted to test students on the content that was taught in the first and second half of the semester. The final exam will be primarily open-ended short essay questions and will be submitted via Blackboard near the end of the semester.

**Grade Breakdown and Scale**
Weekly module of coursework activities (70 points), final project (20 points), and final exam (10 points).

**A:** The key to getting an “A” grade in this class is completing all the coursework activities before the deadlines, making sure they are meeting the described criteria.

**B:** If you either meet all the criteria but coursework activities are consistently late, or coursework activities are done on time but do not meet the described criteria, then you will most likely earn a “B” in this class.

**C or worse:** If you don’t meet the described criteria plus coursework activities are consistently completed late then please contact me so we can discuss options for taking an Incomplete or Withdrawing from the class. If you take an Incomplete, then you will have up to 12-months to complete the coursework activities, but can only get a maximum grade of B.

Total possible: 100 points

A: 90-100 points / B: 80-89 points / C: 70-79 points / D: 60-69 points / F: 0-59 points
Technology and Other Requirements

Equipment: This course requires that you have weekly access to UTEP Email, Blackboard, Zoom, and Grammarly for the duration of the class. Using proofread tools for grammar, word choice, and sentence structure in your writing is required before any short essays and other assignment submissions.

*Learn more about above equipment in the “COURSE RESOURCES” section.

Time: The standard workload for a university course requires a minimum of two hours of study time for every class hour. All course work, both in and outside class, should be of high quality and reflect your development as an aspiring technology-savvy teacher.

Participation: Students are expected to adhere to a social contract of common decency. Stealing or academic cheating will not be tolerated.

COURSE COMMUNICATION

Because this is an online class, we won’t see each other in the ways you may be accustomed to: small group meetings and office hours. However, there are a number of ways we can keep the communication channels open:

Office Hours

My office hours will be held virtually on Zoom using this link: https://utep-edu.zoom.us/j/7252606539 and during the following times:

• Wednesdays, 8:20 to 10:30 pm (Mountain Time = MT)

• By appointment only (BAO)

Email

UTEP e-mail is the best way to contact me. I will make every attempt to respond to your e-mail within 1-2 days of receipt, excluding weekends and holidays. In the body of your e-mail, clearly state your question. At the end of your e-mail, be sure to put your first and last name, and your UTEP email address.

“Email etiquette” is necessary for a quicker response. It serves as a guide to a critical form of communication when entering into academic and professional contexts.

*Note: Here are some tips for effective communications through email in higher education: https://www.uis.edu/cas/thelearninghub/writing/handouts/other/email-etiquette/
Blackboard Announcements
Check the Blackboard announcements weekly for any updates, deadlines, or other important messages.

Blackboard Discussions and Communications
We will communicate through Blackboard’s Discussion Board, Educational Technology Blog, Educational Technology Journal, Zoom, etc.

*Blackboard Learn Help for Students: Click here.

Netiquette (network etiquette)
As we know, sometimes communication online can be challenging. It’s possible to miscommunicate what we mean or to misunderstand what our classmates mean given the lack of body language and immediate feedback. Therefore, please keep these netiquette guidelines in mind.

*Learn more about “Student Conduct and Discipline”: Click here.

- Always consider audience. This is a college-level course; therefore, all communication should reflect polite consideration of other’s ideas.

- Respect and courtesy must be provided to classmates and to the instructor at all times. No harassment or inappropriate postings will be tolerated.

- When reacting to someone else’s message, address the ideas, not the person. Post only what anyone would comfortably state in a face-to-face situation.

- Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professor only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space.

COURSE POLICIES
Participation
During each week of this class, students will complete at least one module of coursework activities in Blackboard. It is essential to complete the coursework on time, both to receive full credit, and because many of the activities build on the materials created in previous coursework.

It is important that students complete the coursework in a timely manner, but it is more important that coursework get completed before moving to the next module of coursework activities—missing any of the coursework activities will decrease your likelihood of getting a desirable grade in this class.
Deadlines
The essence of this class is that each week you will complete new coursework, which will become available at noon on Monday. All assignments are due by **midnight of the following Monday** to receive full credit. For example, for the Week 1 (1/18–1/21) module, your coursework will be due by Monday, 1/24 at midnight. Be sure to check “My Grades” regularly to ensure you are getting the correct points.

Late/Make-up Work
There is no make-up coursework, but late work is accepted. Yet, 10% will be deducted for each week of late submission. In total, you can request up to 3 no-penalty extensions for your late work, no questions asked. Please send your extension request to the instructor via UTEP email before the deadline.

Incomplete Grades
Incomplete grades may be requested only in exceptional circumstances after you have completed at least half of the course requirements. Talk to me immediately if you believe an incomplete is warranted. If granted, we will establish a contract of work to be completed with deadlines.

Accommodations
The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the UTEP Center for Accommodations and Support Services (CASS). Contact the Center for Accommodations and Support Services at 915-747-5148, or email them at cass@utep.edu, or apply for accommodations online via the CASS portal.

Scholastic Integrity
Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another person’s as ones’ own. More information can be found at: [http://admin.utep.edu/Default.aspx?PageContentID=2084&tabid=30292](http://admin.utep.edu/Default.aspx?PageContentID=2084&tabid=30292)
COURSE RESOURCES

Technology
If you have technical problems, please contact the Technology Support Center: Library Room 300 (in-person), Tech Support 915-747-4357 (HELP), Email helpdesk@utep.edu. If you are on-campus, you may also visit the GAIA lab located within the Undergraduate Learning Center (UGLC) building.

Equal Educational Opportunity
In order to create equal educational opportunities in the class, all students are expected to demonstrate respect for the diverse voices and individual differences in the class. Particularly, no person shall be excluded from participation in, denied benefits of, or be subject to discrimination under any program or activity sponsored or conducted by the University of Texas at El Paso on the basis of race, color, national origin, religion, sex, age, veteran status, disability, or sexual orientation. Any member of the University community who engages in discrimination or other conduct in violation of University policy is subject to the full range of disciplinary action, up to and including separation from the University. Complaints regarding discrimination should be reported to the University's Equal Opportunity Office. Inquiries regarding applicable policies should be addressed to the University's Equal Opportunity Office, Kelly Hall, 3rd Floor, 915-747-5662 or eoaa@utep.edu.

Free Writing Assistant and Proofreading Tools
Using either one of the following proofread tools for grammar, word choice, and sentence structure in your writing is required before any short essay submissions.

- UTEP University Writing Center (UWC): Click here for in-person or online meeting with a UWC consultant. The proof of visit can be requested.

- Grammarly: https://www.grammarly.com/ for free online proofreading. A screenshot can be used as the proof of visit the proofreading website.

Other Online Tools
The course online tools include, but are not limited to:
Blackboard for UTEP Students: Click here
Zoom for UTEP Students: Click here
Class Dojo: https://www.classdojo.com/
Kahoot!: https://kahoot.com/
Quizlet: https://quizlet.com/
TeacherKit: https://www.teacherkit.net/
Google Classroom: https://classroom.google.com/
Scratch: https://scratch.mit.edu/
Tinkercad: https://www.tinkercad.com/
Gamification in Education: Click here and read the article HERE
Ed-Media: https://www.aace.org/conf/edmedia/
GlobalLearn: https://www.aace.org/conf/glearn/
SITE: https://site.aace.org/
Innovate Learning Summit: https://www.aace.org/conf/summit/about/
ISTE: https://www.iste.org/about/about-iste
HyFlex: Click here
Floor Plan Style: https://en.wikipedia.org/wiki/Floor_plan

Instructor info:
Yi-Yu Liao, Ph.D.
/ee yoo lee-ow/
(She/Her/Ella)
yliao2@utep.edu

Office Hours: Virtually via Zoom Wednesdays,
8:20 to 10:30 pm (MT)
### COURSE SCHEDULE (SUBJECT TO CHANGE): FROM 1/18–5/5

<table>
<thead>
<tr>
<th>Wk#</th>
<th>Date</th>
<th>Objectives &amp; deadlines</th>
<th>Activities</th>
<th>Outcomes</th>
</tr>
</thead>
</table>
| 1   | 1/18–1/21  | Module 1 due 1/24: Digital literacy assessment. Identification of digital literacy resources. | • Activity 1: My Ed Tech Autobiography  
• Activity 2: My Current Resume  
• Activity 3: My Classroom-Support Websites | Overview of syllabus. Self-introduction. Understanding the definition of educational technology and familiarizing educational technology in schools. |
|     | 1/24–1/28  | Module 2 due 1/31: Universal design. Integration of technology. | • Activity 1: My Two Favorites  
• Activity 2: Discussion of Resumes  
• Activity 3: My Own Ed Tech | Understanding educational technology in the classroom and the school.                                                                  |
| 3   | 1/31–2/4   | Module 3 due 2/7: Collect, analyze data. Increase student engagement. | • Activity 1: Revised Resumes  
• Activity 2: Our Ed Tech Blog  
• Activity 3: Improved Ed Tech Table | Understanding educational technology and teachers and educational technology and students.                                             |
| 4   | 2/7–2/11   | Module 4 due 2/14: Digital skills. Technology-rich classrooms. | • Activity 1: A Cover Letter for My Resume  
• Activity 2: Our Ed Tech Blog  
• Activity 3: Instruction Versus Pedagogy | Understanding educational technology historically and contemporary educational technology.                                             |
| 5   | 2/14–2/18  | Module 5 due 2/21: Professional development. Teaching and learning. | • Activity 1: My Cover Letter Reviews  
• Activity 2: An Alternative to Scratch  
• Activity 3: The Pedagogy of Tinkercad | Understanding educational technology in informal settings and adaptation to educational technology.                                    |
| 6   | 2/21–2/25  | Module 6 due 2/28: The purpose of educational technology. Gamification and makification. | • Activity 1: Revised Cover Letter  
• Activity 2: Gamification  
• Activity 3: Makification | Understanding the resistance to educational technology and educational technology action research.                                  |
• Activity 2: Ed Tech for Gamification  
• Activity 3: Ed Tech for Makification | Understanding educational technology in K-12 as well as higher education, and innovative educational technology.                        |

Last modified date: Monday, January 24, 2022
<table>
<thead>
<tr>
<th>Wk#</th>
<th>Date</th>
<th>Objectives &amp; deadlines</th>
<th>Activities</th>
<th>Outcomes</th>
</tr>
</thead>
</table>
| 8   | 3/7–3/11   | Evolution of educational technologies. Developing innovations.                           | • Activity 1: Let's Meet AACE  
• Activity 2: Gamification Reviews  
• Activity 3: Makification Reviews | Knowing the evolution of technologies that support schools. Factors that encourage and discourage the development of innovation applicable to schools.          |
|     | 3/14–3/18 | Spring break.                                                                           | No assignments this week                                                     |                                                                                                                                          |
• Activity 2: Gamification Revised  
• Activity 3: Makification Revised | Understanding the importance of contextualization of instruction. Creating engaging and memorable thematic contexts.                      |
| 10  | 3/28–4/1   | Gamification as a pedagogy.                                                             | • Activity 1: HyFlex  
• Activity 2: Combining Instructional Strategies  
• Activity 3: My Preference | Understanding the roles for gamification and game-based learning in schools and informal learning.  
(5/25 Cesar Chavez Holiday – no classes) |
| 11  | 4/4–4/8    | Makification as a pedagogy. Makerspaces.                                                | • Activity 1: Your Own Ideas  
• Activity 2: Combining Instructional Strategies  
• Activity 3: My Classroom Design | Understanding the roles and makerspaces in schools and informal education.  
(4/1 Spring Drop/Withdrawal Deadline) |
| 12  | 4/11–4/15  | Augmented Reality. Virtual Reality.                                                     | • Activity 1: My Classroom Design  
• Activity 2: My Classroom Design Continued  
• Activity 3: My Own Classroom Wall | Understanding the roles for augmented reality (AR) and virtual reality (VR) in schools.                                                  |
| 13  | 4/18–4/22  | Digital portfolio knowledge and skills. Web 2.0.                                         | Activity 1: Your Assembled Classroom                                          | Creating an online portfolio showing your educational technology skills and accomplishments. Using Web 2.0 to deliver dynamic digital content. |
The Final Project is a digital portfolio demonstrating teaching with technology skills.

Final Project: My Technology-Rich Classroom

Understanding educational technology topics synthesis. Providing summation and conclusions.

16 5/2–5/6
Final Exam due 5/9

Final Exam.

Final Exam.

(5/6 Dead day)

*Note: The course instructor reserves the right to adjust the course syllabus or change coursework as needed. I will give you ample notice prior to any changes.
## RUBRIC FOR COURSEWORK

<table>
<thead>
<tr>
<th>Grade</th>
<th>Standard to be Achieved for Earning this Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Fully achieves the goals and objectives of the coursework, has made accurate observations, drawn insightful conclusions or extensions, and showed a clear understanding of concepts. Communicates effectively. Completed on time.</td>
</tr>
<tr>
<td>B</td>
<td>Addresses all aspects of coursework, but goals and objectives may not be fully met. The student displays an understanding of the main concepts, although some less important ideas may not be in place. Results may be incomplete or not clearly presented.</td>
</tr>
<tr>
<td>C</td>
<td>Important goals or objectives of the coursework are not met. Work may need redirection. Gaps in conceptual understanding are present. Students’ approach to coursework may lead away from coursework completion. Attempts communication.</td>
</tr>
<tr>
<td>D</td>
<td>The goals and objectives of the coursework are not met. Shows little or no evidence of appropriate reasoning. Presents a fragmented understanding of concepts. Presents erroneous or extraneous conclusions.</td>
</tr>
<tr>
<td>F</td>
<td>Do not attempt coursework.</td>
</tr>
</tbody>
</table>
## Student Learning Outcomes and Assessment

The course’s learning outcomes will require the student to acquire throughout the semester new knowledge and skills pertaining to educational technology, and then build upon them. The following table provides a list of outcomes for the course.

<table>
<thead>
<tr>
<th>Student Learning Outcomes</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>By the end of course, the student:</td>
<td>Assessment procedures:</td>
</tr>
<tr>
<td>Will have learned to assess their degree of digital literacy and identified resources to address any deficiencies identified by the digital literacy evaluation.</td>
<td>Class discussion, coursework activities, and final project.</td>
</tr>
<tr>
<td>Will have learned to integrate technology effectively into curricula and instruction, including activities consistent with the principles of universal design for learning.</td>
<td>Class exercises, coursework activities, final exam, final project.</td>
</tr>
<tr>
<td>Will have learned to use technology effectively to collect, manage, and analyze data to improve teaching and learning for the purpose of increasing student academic achievement.</td>
<td>Class exercises, coursework activities, and final exam, final project.</td>
</tr>
<tr>
<td>Will have learned to continually improve their practice by learning from and with others and exploring proven and promising practices that leverage technology to improve student learning.</td>
<td>Class exercises, discussions, coursework activities, and final project.</td>
</tr>
<tr>
<td>Will have learned to seek out opportunities for leadership to support student empowerment and success and to improve teaching and learning.</td>
<td>Class exercises, discussions, coursework activities, and final project.</td>
</tr>
<tr>
<td>Will have learned to inspire students to positively contribute to and responsibly participate in the digital world.</td>
<td>Class exercises, discussions, coursework activities, and final project.</td>
</tr>
<tr>
<td>Will have learned to dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems.</td>
<td>Class exercises, discussions, coursework activities, and final project.</td>
</tr>
<tr>
<td>Will have learned to design authentic, learner-driven activities and environments that recognize and accommodate learner variability.</td>
<td>Class exercises, discussions, and weekly coursework activities, and final project.</td>
</tr>
<tr>
<td>Will have learned to facilitate learning with technology to support student achievement of the ISTE Standards for Students.</td>
<td>Class exercises, discussions, and weekly coursework activities, and final project.</td>
</tr>
<tr>
<td>Will have learned to understand and use data to drive their instruction and support students in achieving their learning goals.</td>
<td>Class exercises, discussions, and weekly coursework activities, and final project.</td>
</tr>
</tbody>
</table>
APPENDIX A: TEXES COMPETENCIES ADDRESSED DURING COURSE

Here is the list of additional TExES Competencies that this class will address time permitting—

DOMAIN I—TECHNOLOGY APPLICATIONS CORE

Competency 001. The teacher knows technology terminology and concepts; the appropriate use of hardware, software, and digital files; and how to acquire, analyze, and evaluate digital information.

Competency 002. The teacher knows how to use technology tools to solve problems, evaluate results, and communicate information in a variety of formats for diverse audiences.

Competency 003. The teacher knows how to plan, organize, deliver, and evaluate instruction that effectively utilizes current technology for teaching the Technology Applications Texas Essential Knowledge and Skills (TEKS) for all students.

DOMAIN II—DIGITAL GRAPHICS/ANIMATION AND DESKTOP PUBLISHING

Competency 004. The teacher demonstrates knowledge of the principles of design and their application to digital graphics/animation products.

Competency 005. The teacher demonstrates knowledge of principles of typography and page design and knows how to use technology tools to create desktop publishing products.

Competency 006. The teacher knows how to use graphics, animation, and desktop publishing software to produce products that convey a specified message to an intended audience.

DOMAIN III—VIDEO TECHNOLOGY AND MULTIMEDIA

Competency 007. The teacher knows how to produce and distribute digital video and multimedia products.

Competency 008. The teacher demonstrates knowledge of strategies and techniques used in the preproduction, production, and postproduction of video products.

Competency 009. The teacher knows how to design, produce, and distribute multimedia products.

DOMAIN IV—WEBMASTERING

Competency 010. The teacher demonstrates knowledge of strategies and techniques for Web site administration.

Competency 011. The teacher knows principles of Web page design and uses a variety of tools and techniques to design and troubleshoot Web pages for a diverse audience.

Competency 012. The teacher knows how to use Web pages to communicate and interact effectively with others.
APPENDIX B: TEA TEST FRAMEWORKS ADDRESSED DURING COURSE

Here is the list of additional TEA Test Framework for Generalist EC-6 that this class will address time permitting—

10 Competency 009 (Reading, Inquiry, and Research)
The teacher understands the importance of research and inquiry skills to students’ academic success and provides students with instruction that promotes their acquisition and effective use of those study skills in the content areas.

The beginning teacher:
A. Teaches students to develop open-ended research questions and a plan (e.g. timeline) to locate, retrieve, and record information from a range of content-area, narrative, and expository texts
B. Selects and uses instructional strategies to help students comprehend abstract content and ideas in written materials (e.g., manipulatives, examples, graphic organizers)
C. Selects and uses instructional strategies to teach students to interpret information presented in various formats (e.g., maps, tables, graphs) and how to locate, retrieve, and record information from technologies, print resources, and experts
D. Selects and uses instructional strategies to help students understand study and inquiry skills across the curriculum (e.g., brainstorming; generating questions and topics; using text organizers; taking notes; outlining; drawing conclusions; applying critical-thinking skills; previewing; setting purposes for reading; locating, organizing, evaluating, and communicating information; summarizing information; selecting relevant sources of information; using multiple sources of information; recognizing identifying features of sources, including primary and secondary sources; interpreting and using graphic sources of information) and knows the significance of organizing information from multiple sources for student learning and achievement
E. Knows grade-level expectations for study and inquiry skills in the Texas Essential Knowledge and Skills (TEKS) (e.g. in kindergarten, use pictures in conjunction with writing to document research; in fifth-sixth grade, refine research through use of secondary questions)
F. Provides instruction to develop a topic sentence, summarize findings, and use evidence to support conclusions
G. Understands how to foster collaboration with peers, families, and with other professionals to promote all students’ ability to develop effective research and comprehension skills in the content areas

13 Competency 012 (Viewing and Representing)
The teacher understands skills for interpreting, analyzing, evaluating, and producing visual images and messages in various media, including electronic, and provides students with opportunities to develop skills in this area.

The beginning teacher:
A. Knows grade-level expectations for viewing and representing visual images and messages as described in the Texas Essential Knowledge and Skills (TEKS)
B. Understands and teaches the characteristics and functions of different types of media (e.g., film, print) and knows how different types of media influence and inform
C. Teaches students to compare and contrast print, visual, and electronic media, including levels of formality and informality (e.g. email, Web-based news article, blogs)
D. Teaches students to evaluate how visual image makers (e.g., illustrators, documentary filmmakers, political cartoonists, news photographers) represent messages and meanings, and provides students with opportunities to interpret and evaluate visual images in various media
E. Knows how to teach students to analyze visual image makers’ choices (e.g., style, elements, media) and evaluate how those choices help represent or extend meaning

F. Provides students with opportunities to interpret events and ideas based on information from maps, charts, graphics, video segments, and technology presentations and to use media to compare ideas and points of view

G. Knows steps and procedures for teaching students to produce visual images and messages with various meanings to communicate with others

H. Teaches students how to select, organize, and produce visuals to complement and extend meanings

I. Provides students with opportunities to use technology for producing various types of communications (e.g., class newspapers, multimedia reports, video reports) and helps students analyze how language, medium, and presentation contribute to the message

J. Understands how to foster collaboration with families and with other professionals to promote students’ development of media literacy

**Competency 014 (Mathematics Instruction)**

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

The beginning teacher:

A. Plans appropriate instructional activities for all students by applying research-based theories and principles of learning mathematics

B. Employs instructional strategies that build on the linguistic, cultural, and socioeconomic diversity of students and that relate to students’ lives and communities

C. Plans and provides developmentally appropriate instruction that establishes transitions between concrete, symbolic, and abstract representations of mathematical knowledge and that builds on students’ strengths and addresses their needs

D. Understands how manipulatives and technological tools can be used appropriately to assist students in developing, comprehending, and applying mathematical concepts

E. Creates a learning environment that motivates all students and actively engages them in the learning process by using a variety of interesting, challenging, and worthwhile mathematical tasks in individual, small-group, and large-group settings

F. Uses a variety of tools (e.g., counters, standard and nonstandard units of measure, rulers, protractors, scales, stopwatches, measuring containers, money, calculators, software) to strengthen students’ mathematical understanding

G. Implements a variety of instructional methods and tasks that promote students’ ability to do the mathematics described in the Texas Essential Knowledge and Skills (TEKS)

H. Develops clear learning goals to plan, deliver, assess, and reevaluate instruction based on the mathematics in the Texas Essential Knowledge and Skills (TEKS)

I. Helps students make connections between mathematics and the real world, as well as between mathematics and other disciplines such as art, music, science, social science, and business

J. Uses a variety of questioning strategies to encourage mathematical discourse and to help students analyze and evaluate their mathematical thinking

K. Uses a variety of formal and informal assessments and scoring procedures to evaluate mathematical understanding, common misconceptions, and error patterns

L. Understands the relationship between assessment and instruction and knows how to evaluate assessment results to design, monitor, and modify instruction to improve mathematical learning for all students, including English-language learners
M. Understands the purpose, characteristics, and uses of various assessments in mathematics, including formative and summative assessments
N. Understands how mathematics is used in a variety of careers and professions and plans instruction that demonstrates how mathematics is used in the workplace

**Competency 016 (Patterns and Algebra)**
The teacher understands concepts related to patterns, relations, functions, and algebraic reasoning.
The beginning teacher:
A. Illustrates relations and functions using concrete models, tables, graphs, and symbolic and verbal representations, including real-world applications
B. Demonstrates an understanding of the concept of linear function using concrete models, tables, graphs, and symbolic and verbal representations
C. Understands how to use algebraic concepts and reasoning to investigate patterns, make generalizations, formulate mathematical models, make predictions, and validate results
D. Formulates implicit and explicit rules to describe and construct sequences verbally, numerically, graphically, and symbolically
E. Knows how to identify, extend, and create patterns using concrete models, figures, numbers, and algebraic expressions
F. Uses properties, graphs, linear and nonlinear functions, and applications of relations and functions to analyze, model, and solve problems in mathematical and real-world situations
G. Translates problem-solving situations into expressions and equations involving variables and unknowns
H. Models and solves problems, including those involving proportional reasoning, using concrete, numeric, tabular, graphic, and algebraic methods (e.g., using ratios and percent with fractions and decimals)
I. Determines the linear function that best models a set of data
J. Understands and describes the concepts of and relationships among variables, expressions, equations, inequalities, and systems in order to analyze, model, and solve problems
K. Applies algebraic methods to demonstrate an understanding of whole numbers using any of the four basic operations

**Competency 019 (Mathematical Processes)**
The teacher understands mathematical processes and knows how to reason mathematically, solve mathematical problems, and make mathematical connections within and outside of mathematics.
The beginning teacher:
A. Understands the role of logical reasoning in mathematics and uses formal and informal reasoning to explore, investigate, and justify mathematical ideas
B. Applies correct mathematical reasoning to derive valid conclusions from a set of premises
C. Applies principles of inductive reasoning to make conjectures and uses deductive methods to evaluate the validity of conjectures
D. Evaluates the reasonableness of a solution to a given problem
E. Understands connections among concepts, procedures, and equivalent representations in areas of mathematics (e.g., algebra, geometry)
F. Recognizes that a mathematical problem can be solved in a variety of ways and selects an appropriate strategy for a given problem
G. Expresses mathematical statements using developmentally appropriate language, Standard English, mathematical language, and symbolic mathematics

H. Communicates mathematical ideas using a variety of representations (e.g., numeric, verbal, graphic, pictorial, symbolic, concrete)

I. Demonstrates an understanding of the use of visual media such as graphs, tables, diagrams, and animations to communicate mathematical information

J. Demonstrates an understanding of estimation, including the use of compatible numbers, and evaluates its appropriate uses

K. Knows how to use mathematical manipulatives and a wide range of appropriate technological tools to develop and explore mathematical concepts and ideas

L. Demonstrates knowledge of the history and evolution of mathematical concepts, procedures, and ideas

M. Recognizes the contributions that different cultures have made to the field of mathematics and the impact of mathematics on society and cultures

N. Demonstrates an understanding of financial literacy concepts and their application as it relates to teaching students (e.g., describes the basic purpose of financial institutions, distinguishes the difference between gross and net income, identifies various savings options, defines different types of taxes, identifies the advantages and disadvantages of different methods of payments savings and credit uses and responsibilities)

O. Applies mathematics to model and solve problems to manage financial resources effectively for lifetime financial security as it relates to teaching students (e.g., distinguishes between fixed and variable expenses, calculates profit in a given situation, develops a system for keeping and using financial records, describes actions that might be taken to develop and balance a budget when expenses exceed income

Competency 025 (Lab Processes, Equipment, and Safety)

The teacher understands how to manage learning activities, tools, materials, equipment, and technologies to ensure the safety of all students.

The beginning teacher:

A. Understands safety regulations and guidelines for science facilities and science instruction

B. Knows procedures for and sources of information regarding the appropriate handling, use, disposal, care, and maintenance of chemicals, materials, specimens, and equipment

C. Knows procedures for the safe handling and ethical care and treatment of organisms and specimens

D. Selects and safely uses appropriate tools, technologies, materials, and equipment needed for instructional activities

E. Understands concepts of precision, accuracy, and error with regard to reading and recording numerical data from a scientific instrument

F. Understands how to gather, organize, display, and communicate data in a variety of ways (e.g., charts, tables, graphs, diagrams, written reports, oral presentations)

G. Understands the international system of measurement (i.e., metric system) and performs unit conversions within measurement systems including the use of non-standard units