



Mathematics Pedagogy and Core Principles Practicum

Primary Career Cluster:	Education & Training
Course Contact:	CTE.Standards@tn.gov
Course Code:	TBD
Suggested Prerequisites:	Introduction to Teaching as a Profession, Teaching as a Profession I, and Teaching as a Profession II.
Credit:	1
Grade Level:	12
Elective Focus-Graduation Requirement:	This course satisfies one of three credits required for an elective focus when taken in conjunction with other Education and Training courses.
Program Of Study (POS) Concentrator:	This course satisfies one out of two required courses to meet the Perkins V concentrator definition when taken in sequence in an approved program of study.
Program of Study Sequence:	This is the capstone course in the Teaching as a Profession or Early Childhood Education Careers program of study.
Aligned Student Organization(s):	Family, Career and Community Leaders of America (FCCLA): https://www.tennesseeefccla.org/
Coordinating Work-Based Learning (WBL):	Teachers who hold an active WBL certificate may offer placement for credit when the requirements of the state board's WBL Framework and the Department's WBL Policy Guide are met. For information, visit https://www.tn.gov/education/educators/career-and-technical-education/work-based-learning.html .
Tennessee Promoted Student Industry Credentials:	Credentials are aligned with postsecondary and employment opportunities and with the competencies and skills that students acquire through their selected program of study. For a listing of promoted student industry credentials, visit https://www.tn.gov/education/educators/career-and-technical-education/student-industry-certification.html .
Teacher Endorsement(s):	Any teacher who has completed an educator preparation program and has a current practitioner or professional educator license in secondary education covering grade spans 6-12.
Required Teacher Certifications:	None
Required Teacher Training:	All teachers who teach this course within this program of study MUST attend the required professional development provided by the Department of Education.
Teacher Resources:	Best for All Central: https://bestforall.tnedu.gov/

Course at a Glance

CTE courses provide students with an opportunity to develop specific academic, technical, and 21st-century skills necessary to be successful in careers and life. In pursuit of ensuring every student in Tennessee achieves this level of success, we begin with rigorous course standards that feed into intentionally designed programs of study.

Students engage in industry-relevant content through general education integration and experiences such as career & technical student organizations (CTSO) and work-based learning (WBL). Through these experiences, students are immersed with industry-standard content and technology, solve industry-based problems, meaningfully interact with industry professionals, and use/produce industry-specific, informational texts.

Using a Career and Technical Student Organization (CTSO) in Your Classroom

CTSOs are a great resource to put classroom learning into real-life experiences for students through classroom, regional, state, and national competitions, and leadership opportunities. Below are CTSO connections for this course; note this is not an exhaustive list.

Participate in the CTSO Fall Leadership Conference to engage with peers by demonstrating logical thought processes and developing industry-specific skills that involve teamwork and project management.

Participate in contests highlighting job demonstration, interviewing skills, community service activities, extemporaneous speaking, and job interviews.

Participate in leadership activities such as the National Leadership and Skills Conference, National Week of Service, and 21st Century Skills.

Using Work-Based Learning (WBL) in Your Classroom

Sustained and coordinated activities that relate to the course content are the key to successful work-based learning. Possible activities for this course include the following. This is not an exhaustive list.

- **Standards 1.1-3.2** | Invite a guest speaker to explain and demonstrate in practice the instruction of the math core principles.
- **Standards 4.1-5.2** | Complete an integrated project with an industry professional.
- **Standards 6.1-7.2** | Complete an integrated project with a local school on data instruction and assessments.
- **Standards 8.1-8.2** | Participate in an internship.

Course Description

Mathematics Pedagogy and Core Principles Practicum is a capstone course in the Education and Training career cluster for students interested in applying the knowledge and skills learned in previous courses toward becoming an early childhood teacher, a K-12 teacher, or a math specialist. Focusing on the Tennessee Academic Standards, it covers core math principles, instructional strategies, curriculum design, and the developmental needs of students at different grade levels.

Course Standards

1. Introduction to Tennessee's Key Math Principles

- 1.1 Key Math Principles: Analyze and interpret the **Tennessee Academic Standards for Mathematics**, identifying key elements of **Focus, Coherence, and Rigor** as they relate to K-12 instruction.
- 1.2 Integrating Elements in Lessons: Differentiate between **conceptual understanding, procedural skills, fluency, and application, and develop strategies** for **integrating** these elements **into mathematics lessons**.

2. Mathematical Practices for Instruction

- 2.1 Practices for Instruction: Demonstrate the **ability to integrate the Standards for Mathematical Practice (SMPs) into lesson plans**, including strategies for fostering student perseverance in problem-solving and reasoning quantitatively.
- 2.2 Instructional Plans: Develop **case-based instructional plans** that **incorporate explicit mathematics vocabulary, modeling with mathematics, and constructing viable arguments**, tailored to K-12 classroom scenarios.

3. Effective Instructional Strategies in Mathematics

- 3.1 Application of Instructional Strategies: Apply **differentiated instructional strategies** to **address** the diverse **learning needs and abilities of students** in mathematics.
- 3.2 Examples of Strategies: Design and implement **inquiry-based, problem-solving, and cooperative learning activities** that encourage mathematical discourse and enhance conceptual understanding.

4. Curriculum Planning and Lesson Design

- 4.1 Lesson Planning: Develop **lesson plans that align with Tennessee grade-level standards and district adopted high-quality instructional materials (HQIM)** using backward design and goal-setting techniques.
- 4.2 Curriculum Planning: Incorporate real-world applications and interdisciplinary connections into **curriculum planning** to enhance the relevance and engagement of mathematics instruction.

5. Technology and Math Instruction

- 5.1 Technology Tools: Evaluate and integrate **educational technology tools**, such as graphing software and digital manipulatives, **to enhance mathematical understanding and engagement**.
- 5.2 Technology-based Instructional Activities: Design **technology-based instructional activities** that maintain a balance between conceptual focus and technological integration.

6. Classroom Management and Student Engagement in Math

- 6.1 Classroom Management: Develop **classroom management strategies** specifically **tailored to math instruction**, focusing on fostering a productive and inclusive learning environment.
- 6.2 Student Engagement: Implement **techniques to engage reluctant learners**, reduce math anxiety, and promote a growth mindset among students.

7. Assessment and Data-Driven Instruction

- 7.1 Assessment: Create and analyze a **variety of assessments** (formative, summative, and diagnostic) **to monitor and enhance student learning outcomes** in mathematics.
- 7.2 Data-Driven Instruction: **Utilize assessment data to inform instructional decisions, adapt teaching strategies, and support student progress** aligned with Tennessee's math standards.

8. Practicum and Reflection

- 8.1 Practicum Experience: Plan and deliver **microteaching sessions, incorporating feedback** from peers and instructors to refine teaching practices.
- 8.2 Reflection: Maintain a **reflective journal to document observations, personal growth, and strategies for continuous improvement** in mathematics instruction.

Standards Alignment Notes

*References to other standards include:

- P21: Partnership for 21st Century Skills [Framework for 21st Century Learning](#)
 - Note: While not all standards are specifically aligned, teachers will find the framework helpful for setting expectations for student behavior in their classroom and practicing specific career readiness skills.