T & L 5XX
Specialized Methods – Mathematics in the Secondary Classroom

Conceptual Framework
The teacher education programs at the University of North Dakota are grounded on constructivist principles. Through our programs, we support the development of educators who:

- Are committed to the continuing process of learning about many things, especially about their content and learning to teach;
- Are able to take an active role in promoting the learning of all students;

Will advocate with and for students, parents, colleagues, school and community.

Course description and purpose: This specialized module will provide students with the knowledge of current trends, practices, and standards-based pedagogy that will facilitate learning in the secondary mathematics classroom.

Course Objectives and Goals:
You will:

- Become familiar with the Common Core State Standards in Mathematics, the National Council of Teachers of Mathematics standards, and your particular state's standards.
- Use standards to create mathematics lessons and units that will meet the needs of your diverse learners
- Become knowledgeable about appropriate resources, materials, and tools that will support your practice
- Critically examine current research, issues, and trends in mathematics education
- Learn how to assess students' understandings of mathematical content and use relevant data to guide your instruction

InTASC Standards

Standard #1: Learner Development
The teacher understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
Standard #2: Learning Differences
The teacher uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
Standard #3: Learning Environments

The teacher works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

Standard #4: Content Knowledge

The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.

Standard #5: Application of Content

The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.

Standard #6: Assessment

The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.

Standard #7: Planning for Instruction

The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.

Standard #8: Instructional Strategies

The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

Standard #9: Professional Learning and Ethical Practice

The teacher engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

Standard #10: Leadership and Collaboration

The teacher seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

Math Module Learning Plan

1. Standards (2 weeks)
    a. CCSS-M, NCTM, state – content and rationale
    b. ESPB/InTASC/CAEP
    c. Themes and integration across mathematics courses
2. Math practices (1 week)
3. Unit planning and curriculum (4 weeks)
    a. Scope and sequence
        i. Course sequencing across high school

        ii. Unit sequencing within courses
    b. Unit-building
    c. Aligning units to standards
    d. UbD – Stage 1
    e. Curriculum resources
4. Lesson planning and Pedagogy (2 weeks)
    a. UbD – Stage 3
    b. Templates
    c. Lesson flow
    d. Constructivism in math
    e. Aligning to standards
5. Active learning tasks/instructional strategies/critical tasks in math (2 weeks)
    a. Manipulatives
    b. Games
    c. Problem-based learning/collaborative group work/engineering integration
6. Math Technology (1 week)
7. Assessment (2 weeks)
    a. Formative/summative – UbD Stage 2
    b. Diagnostic, interventions
    c. Project-based, integrated assessments
    d. Standardized testing? SBAC? STARS?
8. Diversity, differentiation, equity, and accommodations in math instruction (2 weeks)