



Concepts of Mathematics - 22524 - GNMT 3003 - X21 COURSE SYLLABUS: Spring 2021 (Second Half)

INSTRUCTOR INFORMATION

Instructor: Dr. Austin Kureethara Manuel, Assistant Professor

Office Location: 222 Bridwell Hall

Office Hours: Tuesdays & Thursdays 3 pm – 5 pm, Wednesdays 4 pm – 5 pm

Office Phone: (940)397-4136

Office Fax: (940)397-4694

University Email Address: austin.kureetharamanuel@msutexas.edu

Preferred Form of Communication: austin.manuel@d2lmail.msutexas.edu

Communication Response Time: 24 hours

COURSE INFORMATION

Materials – Online Resources, Readings, Supplementary Readings

Textbooks –None. Numerous links and files will be provided within the course.

Course Description

This course focuses on the mathematics content emphasizing the skills related to knowing Texas Educational Knowledge and Skills (TEKS) standards, and the skills related to teaching Number and Operations, Algebraic reasoning, Geometry and measurement, Data analysis, and Personal financial literacy.

Competency List

This course will build mastery of the following competency (standards):

Commissioner's Standards

Standard 3— Content Knowledge and Expertise.

Teachers exhibit a comprehensive understanding of their content, discipline, and related pedagogy as demonstrated through the quality of the design and execution of lessons and their ability to match objectives and activities to relevant state standards.

- (A) Teachers understand the major concepts, key themes, multiple perspectives, assumptions, processes of inquiry, structure, and real-world applications of their grade-level and subject-area content.
- i. Teachers have expertise in how their content vertically and horizontally aligns with the grade-level/subject-area continuum, leading to an integrated curriculum across grade levels and content areas.
 - ii. Teachers identify gaps in students' knowledge of subject matter and communicate with their leaders and colleagues to ensure that these gaps are adequately addressed across grade levels and subject areas.

- iii. Teachers keep current with developments, new content, new approaches, and changing methods of instructional delivery within their discipline.
- (B) Teachers design and execute quality lessons that are consistent with the concepts of their specific discipline, are aligned to state standards, and demonstrate their content expertise.
- i. Teachers organize curriculum to facilitate student understanding of the subject matter.
 - ii. Teachers understand, actively anticipate, and adapt instruction to address common misunderstandings and preconceptions.
 - iii. Teachers promote literacy and the academic language within the discipline and make discipline-specific language accessible to all learners.
- (C) Teachers demonstrate content-specific pedagogy that meets the needs of diverse learners, utilizing engaging instructional materials to connect prior content knowledge to new learning.
- i. Teachers teach both the key content knowledge and the key skills of the discipline.
 - ii. Teachers make appropriate and authentic connections across disciplines, subjects, and students' real-world experiences

Content Standards PK-3

[19 TAC §235.13(d)] Mathematics

The Early Childhood: Prekindergarten-Grade 3 classroom teachers demonstrate understanding of Kindergarten-Grade 5 Mathematics TEKS, with an emphasis on Kindergarten-Grade 3, and Mathematics Texas Prekindergarten Guidelines and apply knowledge of developmentally appropriate, research- and evidence-based assessment and instructional practices to promote students' development of grade-level skills.

Exam Frame Work PK-3 Domain V – Learning Across the Curriculum

Competency 011 (Mathematics): Understand foundational principles, concepts, and methods in mathematics to provide developmentally appropriate instruction for students in prekindergarten to grade 3.

- A. Demonstrate knowledge of the Mathematics domain of the Texas Prekindergarten Guidelines and the Texas Essential Knowledge and Skills (TEKS) for Mathematics (Kindergarten through Grade 5), as well as ways to scaffold and sequence skills and concepts to teach mathematics to young children.
- B. Demonstrate knowledge of foundational characteristics and processes in children's mathematical development, including elements of mathematical understanding (e.g., conservation, one-to-one correspondence, counting, cardinality), and indicators that a student may be experiencing difficulties or demonstrating advanced abilities in mathematics.
- C. Apply knowledge of developmentally appropriate strategies and activities, including the progression of conceptual to procedural understanding

specific to areas of mathematical content (e.g., number sense, numeracy, whole-number operations, geometry, spatial sense, fractions, algebraic reasoning), and mathematical language for developing children's knowledge and skills in these areas through a variety of meaningful, authentic learning experiences and real-world applications.

- D. Demonstrate knowledge of instructional resources, tools, and materials, including manipulatives, children's literature, and technology for teaching mathematics.
- E. Apply knowledge of ways to build on children's interests by creating meaningful opportunities and experiences that promote the development of students' conceptual understanding and mathematical thinking, including incorporating play and manipulatives into daily activities.
- F. Apply knowledge of teaching practices that enhance children's mathematical problem solving and reasoning and promote their ability to represent, communicate, and connect mathematical ideas in their everyday lives.
- G. Apply knowledge of developmentally appropriate strategies for encouraging students to view themselves as competent mathematical thinkers and activities for promoting students' ability to think and communicate mathematically.
- H. Apply knowledge of approaches for integrating mathematical content with other areas of the curriculum and with everyday activities, including written expression.
- I. Demonstrate knowledge of ways to foster collaboration with families and with other professionals to promote and encourage all students' development of mathematical thinking and numeracy.
- J. Demonstrate knowledge of developmentally appropriate activities for teaching mathematical language, vocabulary, and key concepts specific to financial literacy.

PPR PK-3 Standard 19 TAC §235.11(d) Content Knowledge and Expertise.

Early Childhood: Prekindergarten-Grade 3 classroom teachers exhibit an understanding of content, discipline, and related pedagogy as demonstrated through the quality of the design and execution of lessons and the ability to match objectives and activities to relevant state standards. Early Childhood: Prekindergarten-Grade 3 classroom teachers must:

- (1) have expertise in how their content vertically and horizontally aligns with the grade-level/subject area continuum, leading to an integrated curriculum across grade levels and content areas.
- (7) teach both the key content knowledge and the key skills of the discipline.

Student Learning Outcomes Arranged in Modules

M1 – LO1. Know your TEKS. (Grades K-5)

Upon completion of this course, the student-teacher will be able to

(LO1): Demonstrate knowledge of the Mathematics domain of the Texas Prekindergarten Guidelines and the Texas Essential Knowledge and Skills (TEKS) for

Mathematics (Kindergarten through Grade 5), as well as ways to scaffold and sequence skills and concepts to teach mathematics to young children.

Standards addressed in this module:

- Classroom teachers demonstrate understanding of Kindergarten-Grade 5 Mathematics TEKS, with an emphasis on Kindergarten-Grade 3, and Mathematics Texas Prekindergarten Guidelines and apply knowledge of developmentally appropriate, research- and evidence-based assessment and instructional practices to promote students' development of grade-level skills. CSPK-3.19TAC235.13.(d)
- Demonstrate knowledge of the Mathematics domain of the Texas Prekindergarten Guidelines and the Texas Essential Knowledge and Skills (TEKS) for Mathematics (Kindergarten through Grade 5), as well as ways to scaffold and sequence skills and concepts to teach mathematics to young children. EFPK-3.Domain V.Comp 011.A
- Classroom teachers exhibit an understanding of content, discipline, and related pedagogy as demonstrated through the quality of the design and execution of lessons and the ability to match objectives and activities to relevant state standards. Prekindergarten-Grade 3 classroom teachers must have expertise in how their content vertically and horizontally aligns with the grade-level/subject area continuum, leading to an integrated curriculum across grade levels and content areas PPR_PK-3.Standard 19 TAC §235.11.(d).1

M2 – LO2, LO3. Number and Operations (Grades K-5)

Upon completion of this course, the student-teacher will be able to

(LO2): Design and execute quality lessons that are consistent with the concepts of their specific discipline, are aligned to state standards, and demonstrate their content expertise related to Number concepts and Operations (Grades K-5) and demonstrate content-specific pedagogy that meets the needs of diverse learners, utilizing engaging instructional materials to connect prior content knowledge to new learning.

(LO3): Understand the major concepts, key themes, multiple perspectives, assumptions, processes of inquiry, structure, and real-world applications of their grade-level and subject-area content related to Number concepts and Operations (Grades K-5)

In addition, to the above, the learning objectives of this course are tied with the following standards.

Standards addressed in this module:

- CSPK-3.19TAC235.13.(d)
- EFPK-3.Domain V.Comp 011.D, E, F, G, H, I, J
- Comm.S3.A.i, ii, iii
- Comm.S3.B.i, ii, iii
- Comm.S3.C.i, ii
- PPR_PK-3.Standard 19 TAC §235.11.d.7
- EFPK-3.Domain V.Comp 011.A, B, C

M3 – LO2, LO4 Algebraic reasoning (Grades K-5)

Upon completion of this course, the student-teacher will be able to

(LO2): Design and execute quality lessons that are consistent with the concepts of their specific discipline, are aligned to state standards, and demonstrate their content expertise related to Number concepts and Operations (Grades K-5) and demonstrate content-specific pedagogy that meets the needs of diverse learners, utilizing engaging instructional materials to connect prior content knowledge to new learning.

(LO4): Understand the major concepts, key themes, multiple perspectives, assumptions, processes of inquiry, structure, and real-world applications of their grade-level and subject-area content related to Algebraic reasoning (Grades K-5)

In addition, to the above, the learning objectives of this course are tied with the following standards.

Standards addressed in this module:

- CSPK-3.19TAC235.13.(d)
- EFPK-3.Domain V.Comp 011.D, E, F, G, H, I, J
- Comm.S3.A.i, ii, iii
- Comm.S3.B.i, ii, iii
- Comm.S3.C.i, ii
- PPR_PK-3.Standard 19 TAC §235.11.d.7
- EFPK-3.Domain V.Comp 011.A, B, C

M4 – LO2, LO5 Geometry and measurement (Grades K-5)

Upon completion of this course, the student-teacher will be able to

(LO2): Design and execute quality lessons that are consistent with the concepts of their specific discipline, are aligned to state standards, and demonstrate their content expertise related to Number concepts and Operations (Grades K-5) and demonstrate content-specific pedagogy that meets the needs of diverse learners, utilizing engaging instructional materials to connect prior content knowledge to new learning.

(LO5): Understand the major concepts, key themes, multiple perspectives, assumptions, processes of inquiry, structure, and real-world applications of their grade-level and subject-area content related to Geometry and measurement (Grades K-5)

In addition, to the above, the learning objectives of this course are tied with the following standards.

Standards addressed in this module:

- CSPK-3.19TAC235.13.(d)
- EFPK-3.Domain V.Comp 011.D, E, F, G, H, I, J
- Comm.S3.A.i, ii, iii
- Comm.S3.B.i, ii, iii
- Comm.S3.C.i, ii
- PPR_PK-3.Standard 19 TAC §235.11.d.7
- EFPK-3.Domain V.Comp 011.A, B, C

M5 – LO2, LO6 Data analysis (Grades K-5)

Upon completion of this course, the student-teacher will be able to

(LO2): Design and execute quality lessons that are consistent with the concepts of their specific discipline, are aligned to state standards, and demonstrate their content

expertise related to Number concepts and Operations (Grades K-5) and demonstrate content-specific pedagogy that meets the needs of diverse learners, utilizing engaging instructional materials to connect prior content knowledge to new learning.

(LO6): Understand the major concepts, key themes, multiple perspectives, assumptions, processes of inquiry, structure, and real-world applications of their grade-level and subject-area content related to Data analysis (Grades K-5)

In addition, to the above, the learning objectives of this course are tied with the following standards.

Standards addressed in this module:

- CSPK-3.19TAC235.13.(d)
- EFPK-3.Domain V.Comp 011.D, E, F, G, H, I, J
- Comm.S3.A.i, ii, iii
- Comm.S3.B.i, ii, iii
- Comm.S3.C.i, ii
- PPR_PK-3.Standard 19 TAC §235.11.d.7
- EFPK-3.Domain V.Comp 011.A, B, C

M6 – LO2, LO7 - Personal financial literacy (Grades K-5)

Upon completion of this course, the student-teacher will be able to

(LO2): Design and execute quality lessons that are consistent with the concepts of their specific discipline, are aligned to state standards, and demonstrate their content expertise related to Number concepts and Operations (Grades K-5) and demonstrate content-specific pedagogy that meets the needs of diverse learners, utilizing engaging instructional materials to connect prior content knowledge to new learning.

(LO7): Understand the major concepts, key themes, multiple perspectives, assumptions, processes of inquiry, structure, and real-world applications of their grade-level and subject-area content related to Personal financial literacy (Grades K-5)

In addition, to the above, the learning objectives of this course are tied with the following standards.

Standards addressed in this module:

- CSPK-3.19TAC235.13.(d)
- EFPK-3.Domain V.Comp 011.D, E, F, G, H, I, J
- Comm.S3.A.i, ii, iii
- Comm.S3.B.i, ii, iii
- Comm.S3.C.i, ii
- PPR_PK-3.Standard 19 TAC §235.11.d.7
- EFPK-3.Domain V.Comp 011.A, B, C

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Must be able to use Microsoft, Google Suites, Webtools available for teachers, & D2L.

INSTRUCTIONAL METHODS & ASSESSMENTS

This is an online Competency Based Education (CBE) course. Learning activities include assorted reading and videos, discussions, quizzes, pre and posttests, and a final project.

Pretest

The Pretest for this course assesses your knowledge in mathematical content emphasizing the skills related to number and operations, algebraic reasoning, geometry and measurement, data analysis and personal financial literacy. The purpose of the pretest is to provide a baseline understanding of your knowledge in this competency. The pretest is required for the course.

Module Tests

You need to complete a test in each module. You should score at least 80% in each test to move to the next module. Again, it is a great opportunity to review what you learned in each module. The standards addressed in the module tests are:

Module Test Standards.

- PPR_PK-3.Standard 19 TAC §235.11.d.7
- EFPK-3.Domain V.Comp 011.B
- EFPK-3.Domain V.Comp 011.C

Quality Mini Lessons

You need to design one quality mini lesson that are consistent with the concepts of their specific discipline, are aligned to state standards, and demonstrate your content expertise related to the content in each module. The quality mini lessons should demonstrate content-specific pedagogy that meets the needs of diverse learners, utilizing engaging instructional materials to connect prior content knowledge to new learning. The associated template with instructions and the rubrics are provided in each module. The following standards are addressed in each quality mini lesson.

Quality Mini Lesson Requirements/Standards

(Refer the section “Competency List” to see full description of the standards).

- Comm.S3.A.i
- Comm.S3.B.iii
- Comm.S3.C
- Comm.S3.A.ii
- Comm.S3.B.i
- PPR_PK-3.Standard 19 TAC §235.11.d.7
- Comm.S3.B.ii
- EFPK-3.Domain V.Comp 011.D
- EFPK-3.Domain V.Comp 011.E
- EFPK-3.Domain V.Comp 011.F
- EFPK-3.Domain V.Comp 011.G
- Comm.S3.C.ii
- EFPK-3.Domain V.Comp 011.H
- EFPK-3.Domain V.Comp 011.I
- Comm.S3.A.iii
- CSPK-3.19TAC235.13.(d)
- EFPK-3.Domain V.Comp 011.A

Posttest

for this course assesses your knowledge in mathematical content emphasizing the skills related to number and operations, algebraic reasoning, geometry and measurement, data analysis and personal financial literacy. The Posttest is an assessment of your knowledge of the material required for the competency. The standards required to meet for this assessment are enlisted in the section “Module Tests”, above. A score of 80 points or higher is required to demonstrate the competency. If you score less than 80 points on any competency, you will have an opportunity to review the material and re-take the competency Posttest. You may take the Posttest assessment up to three times. If you have not passed the competency in three attempts, you will work with a Faculty Coach to determine another method of fulfilling the program requirements in this subject.

Comprehensive Assessment. Final Quality Mini Lesson Plan.

After successfully creating five mini lesson plans, you should have learned the concept of creating a quality lesson plan. You are required to create a final quality mini lesson plan, which follows the same guidelines and rubrics as the ones that you did in each module. This final quality mini lesson plan will serve as your comprehensive assessment for this course, in addition to the posttest. The standards required to meet in this assessment are enlisted in the section “Quality Mini Lesson”, above. You are required to score at least 80% in this assessment to be successful in this course. You should not use the TEKS that you had selected for any of the previous quality mini lesson plans in this course for this assignment. You will see more directions in the corresponding dropbox.

Competency assessments.

- The Posttest and the module tests assess your overall knowledge of the learning outcomes related with content knowledge for this course (See the standards in the corresponding section.). To emphasize, **a score of 80 percent or higher on the Posttest is required to demonstrate competency.** You should also score at least 80% in the module tests to move on to the next module. You are allowed to retest the module tests.
- The Quality mini lessons included in each module and the Comprehensive Assessment measure the standards listed in the section “Quality Lesson Plans”, above. The corresponding template (with instructions) and a rubric are posted in each module for your help.

If the 15-week term ends and you do not complete all competencies, you will receive a grade of "F" and be required to complete the remaining competencies in the next term.

Student Responsibilities or Tips for Success in the Course

To be successful in this course, plan to spend at least 2 hours a day to read/listen to online content, post discussion responses, complete assignments, and study the course material.

GRADING

Final grades in this course will be based on the accumulated grade and the table below:

A = 90%-100%

B = 80%-89%

F = 70%-79% or Below

TECHNOLOGY REQUIREMENTS

LMS (Desire 2 Learn – D2L)

All course sections offered by MSU have a corresponding course shell in the D2L Online Learning Management System (LMS). See the technical requirements and associated system check in the webpage, [D2L Technical Requirements](#)

ACCESS AND NAVIGATION

You will need your user name and password to log into the course. If you do not know your user name or have forgotten your password, contact helpdesk@mwsu.edu. For more information on the MSU's IT services, see [Information Technology](#).

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your Instructor Coach.

Technical Support

If you are new to D2L or if you are having technical difficulty with any part of D2L, please contact [Distance Education](#). Other support options can be found in their [webpage](#).

Interaction with Instructor Statement

Expect responses to email within **24** hours and feedback on your posttest within **48** hours.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

In order to demonstrate competency, you must achieve 80% or higher on each required competency assessment.

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

UNIVERSITY SPECIFIC PROCEDURES

Student Conduct

Students are expected to uphold and abide by certain standards of conduct that form the basis of the Student Code of Conduct. These standards are embodied within a set of core values that include integrity, social justice, respect, community, and responsibility. When members of the MSU community fail to exemplify these values, campus conduct proceedings are used to assert and uphold the Student Code of Conduct. The Code of Student Conduct is described in detail in the Student Handbook. Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:

<https://www.britannica.com/topic/netiquette>

Electronic Network Access

Students using the university network facilities and services will indemnify and hold harmless the university against any and all actions or claims of infringement of intellectual property rights arising from the use of a network-based service or facility provided by the university. Network access is provided by password control. All passwords are managed and controlled by Information Systems. See Student Handbook for specific policies on electronic network access.

Academic Dishonesty

Students at MSU are expected to maintain high standards of integrity and honesty in their scholastic work. For more details and the definition of academic dishonesty see the Student Handbook.

STUDENTS WITH DISABILITIES—ADA STATEMENT

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. It is the policy of Midwestern State University that no otherwise qualified person, on the basis of disability, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any education program, activity, or employment of the university. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services

Physical location: Room 168, Clark Student Center, 3410 Taft Blvd, Wichita Falls, TX 76308.

Phone: (940) 397-4140

Email: debra.higginbotham@msutexas.edu

Website: <https://msutexas.edu/student-life/disability/>

Nondiscrimination Notice

MSU will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an

environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

CAMPUS CONCEALED CARRY STATEMENT

MSU is committed to providing a safe and secure learning, working, and living environment for students, faculty, staff, and visitors, and to respecting the right of individuals who are licensed to carry a handgun where permitted by law. Individuals who are licensed to carry may do so on MSU’s campus premises except in locations and at activities that are prohibited. The carrying of any handgun by an unlicensed person or the open carry of a handgun is not permitted in any place on MSU’s campus premises. For more information on Carrying Concealed Handguns, see the [Student Handbook](#).

Assignments

Module	Assignment Name	Assignment score	Required Score
Pretest	Pretest (out of 200; not counted towards your grade)	-	-
M1	Know Your TEKS Test	100	80%
M2	Number and Operations (Grades K-5) Test	100	80%
M2	Number and Operations (Grades K-5) Quality Mini Lesson	100	80%
M3	Algebraic reasoning (Grades K-5) Test	100	80%
M3	Algebraic reasoning (Grades K-5) Quality Mini Lesson	100	80%
M4	Geometry and measurement (Grades K-5) Test	100	80%
M4	Geometry and measurement (Grades K-5) Quality Mini Lesson	100	80%
M5	Data analysis (Grades K-5) Test	100	80%
M5	Data analysis (Grades K-5) Quality Mini Lesson	100	80%
M6	Personal financial literacy (Grades K-5) Test	100	80%
M6	Personal financial literacy (Grades K-5) Quality Mini Lesson	100	80%
M7	Posttest (Modules 1 -5)	200	80%
M7	Comprehensive Assessment – Final Quality Mini Lesson	200	80%
Total	Total	1500	-

COURSE OUTLINE

Module Topic	Materials to Read and Review	Assignments
Pretest	No Review Needed	Complete on first day. Module M1 will open only after you finish the Pretest.
M1 – LO1. Know your TEKS. (Grades K-5)	Read articles and watch videos in the module.	<ul style="list-style-type: none"> • Module 1 Assignment – Know Your TEKS
M2 – LO2, LO3. Number and Operations (Grades K-5)	Read articles and watch videos in the module.	<ul style="list-style-type: none"> • Number and Operations (Grades K-5) Test • Number and Operations (Grades K-5) Quality Mini Lesson
M3 – LO2, LO4 Algebraic reasoning (Grades K-5)	Read articles and watch videos in the module.	<ul style="list-style-type: none"> • Algebraic reasoning (Grades K-5) Test • Algebraic reasoning (Grades K-5) Quality Mini Lesson
M4 – LO2, LO5 Geometry and measurement (Grades K-5)	Read articles and watch videos in the module.	<ul style="list-style-type: none"> • Geometry and measurement (Grades K-5) Test • Geometry and measurement (Grades K-5) Quality Mini Lesson
M5 – LO2, LO6 Data analysis (Grades K-5)	Read articles and watch videos in the module.	<ul style="list-style-type: none"> • Data analysis (Grades K-5) Test • Data analysis (Grades K-5) Quality Mini Lesson
M6 – LO2, LO7 Personal financial literacy (Grades K-5)	Read articles and watch videos in the module.	<ul style="list-style-type: none"> • Personal financial literacy (Grades K-5) Test • Personal financial literacy (Grades K-5) Quality Mini Lesson
M7 – Competency Assessments POSTTEST & Final Quality Mini Lesson Plan	REVIEW ALL NECESSARY MODULES	<ul style="list-style-type: none"> • COMPLETE BEFORE FINAL DAY 5:00PM (80% or higher) • Posttest and • Final Quality Mini Lesson Plan