

Designing Coherent Mathematics Intervention for Diverse Learners

Instructors:

Erica Moy, PhD

Molly Snow, M.Ed. and Post Grad Certificate

Meeting date and times:

In Person 8 am - 4 pm, including office hours on October 10, 2026; January 9, 2027; April 10, 2027

Asynchronous hours: 8 hours of video modules and journals; 5 hours of case study work

Virtual Meetings - 3 hours; 1 hour in November, February, and March

Location: VTSU Willison Campus Room TBD

Credits: 3

Course Rationale and Description:

This course is designed for all educators, especially those providing tier 2 or 3 small group targeted lessons teaching any level while focusing on K-8 content standards. This could include math interventionists/specialists, special educators/learning specialists, multilingual learner educators, instructional assistants/paraeducators, and classroom teachers.

In this course, we will explore routines and structures for intervention. We will use research and evidence-based practices to design learning environments that support engagement and student understanding to maximize student learning. This will be done through the use of various models and strategies that support mathematical reasoning and sense-making. We will review additive, multiplicative, and proportional reasoning to deeply reflect on how these are incorporated into setting goals and planning for intervention. This course will explore methods to gather evidence of student mastery in math content and practice standards. Participants will learn to implement a variety of assessment strategies to monitor progress, evaluate skills, and target future instructional steps.

Each day of class will incorporate:

1. Content - engage with an aspect(s) of content standards, synthesize and connect concepts from different domains and number types,
2. Instruction - engage with evidence-based teaching practices (NCTM) and instructional routines/strategies, and reflect on how these practices can apply to instructional design
3. Assessment - analyze student skills to precisely plan your next instructional steps; consider the role of formative and summative assessments - including observational data, exit tickets, interviews, student self-reflection
4. Intervention structures - discuss ideas for implementation, explore and discuss research on effective practices, and apply evidence to prepare differentiated instruction

Learning Objectives:

Participants will

1. Consider different formats and structures for intervention, developed for sense-making and explicitly making connections to grade-level standards
2. Increase understanding of effective teaching practices, UDL, and instructional routines to meet students' needs
3. Understand how assessments and feedback are ongoing and are critical to responsive intervention and planning the next instructional steps
4. Apply their learning to design, implement, and reflect on an intervention

Required Readings and Videos:

Fennel, F., Kobett, B., Wray, J. (2017) *The Formative 5: everyday assessment techniques for every math classroom*

Harris, Pam *Developing Mathematical Reasoning* Modules 1-4 - online

One of the following, select the appropriate grade band for your work/interest to complete your case study project:

SanGiovanni, J. (2017). *Mine the Gap for Mathematical Understanding: Common holes and misconceptions and what to do about them Grades K-2*

SanGiovanni, J. (2016). *Mine the Gap for Mathematical Understanding: Common holes and misconceptions and what to do about them Grades 3-5*

SanGiovanni, J., Novak, J. (2016). *Mine the Gap for Mathematical Understanding: Common holes and misconceptions and what to do about them Grades 6-8*

Recommended Readings:

SanGiovanni, J., Bay-Williams, J., Katt, S. (2024). *Figuring Out Fluency--Ten Foundations for Reasoning Strategies with Whole Numbers A Classroom Companion*.

Lambert, R. (2024). *Rethinking Disability and Mathematics: A UDL Math Classroom Guide for Grades K-8*.

[Redefining What it Means to Be Good At Math](#) Mike Flynn

Harris, P. (2025). *Developing Mathematical Reasoning: Avoiding the Trap of Algorithms*.

Instructional Sequence:

Daily activities and topics might shift. These are the broad topics that will be explored.

In person Day 1	- Structures of interventions - Evaluate and analyze assessment to analyze current student knowledge and set intervention goals - Engaging students in reasoning and sensemaking
Asynchronous Modules 1-4	8 hours of video modules from Math is Figureoutable - Journal for each module - Module 1: What is Mathematical Reasoning - Module 2: Additive Reasoning - Module 3: Multiplicative Reasoning - Module 4: Proportional and Functional Reasoning
Virtual Meeting 1	- Update on case study - Planning next steps - Reading the discussion on the assignment from the previous class
Day 2	- Progress monitoring - Adjusting instruction in response to student needs - Engaging students in reasoning and sensemaking - Explicit connections across all tiers of instruction
Virtual Meeting 2	- Update on case study - Planning next steps - Reading the discussion on the assignment from the previous class
Virtual Meeting 3	- Update on case study - Planning next steps - Reading discussion on the assignment from the previous class
Day 3	- Presenting intervention case studies - Reflecting on systemic changes to improve student learning - Integrating new learning into professional practice

Course Assignments:

Class Assignments:

Daily classwork, reading/video reflection and discussion, math tasks - individual and collaborative, journal responses, exit tickets, self-reflections, asynchronous modules and accompanying journal responses, virtual meetings

Final Project: Case study and presentation.

Case study:

- Get to know your student(s) through data review, work samples and student observation.
- Use this information to set a goal, plan intervention sessions, then implement and reflect on intervention sessions.
- One video of your intervention should be recorded, this will be incorporated into the final project and case study analysis.

Presentation:

- Prepare a 10 minute presentation to highlight assessments, goals, and student progress throughout the intervention.
- Include a reflection on successes, next steps with the student(s) and elements that would be changed for future implementation of this type of intervention.

Course Grading:

Daily classwork, assigned readings, tasks, and journals - 30%

Final project - 40%

Attendance, class participation, and helpfulness to colleagues - 30%

Course Requirements:

1. Attendance Expectations: Full attendance is required. In the event of an emergency requiring an absence, the participant will arrange with the instructor to make up all work that was missed on the day of the absence. No grade will be issued until the submission of completed assignments.
2. Religious Observance: The official policy for excused absences for religious holidays: Students have the right to practice the religion of their choice. Each semester, students should submit in writing to their instructors by the end of the second full week of classes their documented religious holiday schedule for the semester. Faculty must permit students who miss work for the purpose of religious observance to make up this work.
3. Contributions in Class: All participants are expected to model excellence, embrace and practice communication, overflow with intellectual curiosity, welcome opportunities for change, and contribute to a positive learning culture in class. In particular, participants should contribute to a positive group experience by helping others and participating in discussion groups and morning homework groups, and by maintaining a positive attitude.
4. Quality of Completed Assignments: All class assignments should be neat, organized, and professionally completed. Assignments that do not meet this level should be revised and rewritten.
5. Academic Honesty & Professionalism: All students are required to be familiar with and adhere to the academic honesty policies established by VT State University.
6. Accommodations: The Vermont Mathematics Initiative is dedicated to providing equal access to individuals with disabilities, in accordance with Section 504 of the Rehabilitation Act of 1973, Title III of the Americans with Disabilities Act (ADA) of 1990, and the Americans with Disabilities Act Amendments Act of 2008.
7. Course Grading: VMI participants are expected to show growth in mathematics content understanding, relative to where they started. Not everyone will be at the same place mathematically at the end of the course, but every participant should have made gains. It is the responsibility of the participant to contact the

instructor(s) or program director to make arrangements for additional learning experiences or one-on-one tutoring if one feels they are not making gains in their content understanding.