

Western New Mexico University

Graduate Certificate in Mathematics Program

The Program

18 Graduate Credit Hours of Mathematics, based of some of the recommendations from *The Mathematical Education of Teachers II* (CBMS 2012):

- Linear Algebra for Teachers (3 CR hrs.)
- Number Theory for Teachers (3 CR hrs.)
- Abstract Algebra for Teachers (3 CR hrs.)
- A History of Mathematics for Teachers (3 CR hrs.)
- Further Topics in Mathematics for Teachers (3 CR hrs.)
- Pedagogical Practices for Mathematics Teachers (3 CR hrs.)

The Design

Collaboration with colleagues at UNM-Taos and Central New Mexico College:

- Courses are available online
- One course offered each semester and one course offered in the summer
- Each course emphasizes connections with the content taught by two-year college teachers
- Each course offers an opportunity for teachers to use and share evidenced-based pedagogical approaches
- Participants meet weekly (via Zoom or face-to-face) to work on problems and/or discuss pedagogical strategies
- Participants meet monthly with the instructor (via Zoom)
- Each course starts with a day-long workshop prior to the beginning of the semester

The Material

Sources used:

- *Linear Algebra and Its Applications*, by Lay, et. al.
- *An Illustrated Theory of Numbers*, by Martin H. Weissman
- The MAA Instructional Practice Guide, by the Mathematical Association of America
- AMATYC IMPACT, by the American Mathematical Association of Two-Year Colleges

Background

- UNM Taos is a 2 year Branch Campus of University of New Mexico; a Rural Community located in N. Central NM
- Opportunity**
- A Title V 'Guided Pathways to Success' (GPS) grant permitted recruitment of 2 new full time faculty
 - GPS also included funds for Math Department Professional Development
- Grant Objective**
- Increase Student learning and completion rates by restructuring Developmental Courses.

Vision & Approach

Vision

- Reshape UNM-T Math department to become a fully collaborative Professional Learning Community.
'Any course problem is a Math Department problem'
- Remove identification of faculty as the 'Remedial Teacher'/'Trig Teacher'/'Algebra Teacher' etc.
 - Faculty choose their preferred courses & all faculty participate in all course development

Approach

- Enhance Faculty Content Knowledge (and ensure HLC compliance) by enrolling in WNMU Graduate Certificate in Mathematics
- Use instructional approaches outlined in AMATYC IMPACT document
- Support Pedagogical shifts with additional Professional Development – in class and out of class – partner with MC² group at NMSU.

Program Format

WNMU Course Format

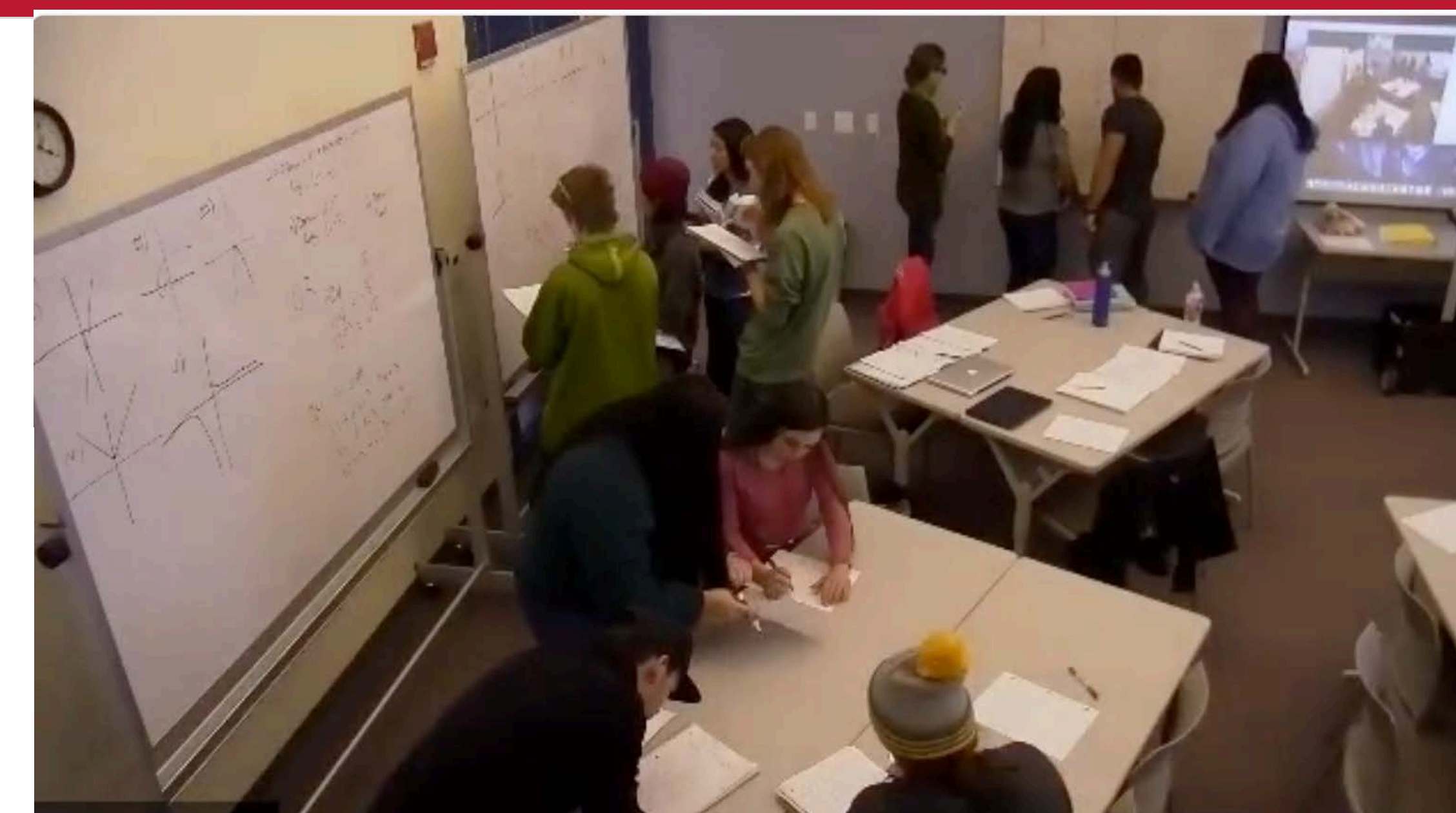
- One 3CR hybrid course each Semester (Fall, Spring, Summer)
- Start each course with one or two day live workshop
- Participants meet weekly for face to face discussion/ assignment sessions.
- Remote participants join via Zoom video conferencing.
- Monthly Zoom sessions with Instructor.



Faculty members in Zoom Session with MC²

Departmental Support Structure

- Monthly Departmental meeting focusing on:
 - Feedback on Success/Failure of class room approaches
 - Progress on current priority project.
 - Plan next steps



College Algebra Class working on Group Chapter Review

MC² Support Format

- Start each semester with one or two day live workshop for team building, doing math together, defining pedagogy priorities (individual and departmental) for Semester
- Biweekly Zoom support sessions between faculty & MC².
- Two additional 2 day Workshops each semester.
- **Mid Semester Workshop Format**
 - One day where MC² Staff visit classes during instruction for
 - Formative class room observation
 - Co teaching
 - Modelling pedagogy for Instructor
 - Covering class to allow instructor to visit another class
 - One Day of Department meeting for:
 - Reflection on Classroom visits
 - Do Math Together
 - Read & discuss Pedagogical Research Paper
 - Departmental 'Big Picture' discussion re targets & projects

Products and Plans

Products So Far

- Creation of a variety of class room activities for Pre Algebra & Introductory Algebra
 - Group work
 - Conceptual Development
 - Exploratory
- Use of 'Number Talks' in Pre-Algebra to College Algebra
 - Increase Number Sense
 - Promote & display alternate solution strategies
 - Start class wide discourse on math

Current Priority Project

- Restructure Pre-Algebra & Intro Algebra Course SLO's (as per AMATYC IMPACT Document).

MC²

The goal of Mathematically Connected Communities (MC²) is to improve the mathematics learning for students in grades k-16 through professional learning experiences that

- Build teacher mathematics knowledge and pedagogical skills for effective teaching.
- Promote district or math department's capacity for creating support systems and structures for educator ongoing, job-embedded professional learning.

MC² team meets with UNM Taos Team regularly during the academic year to identify and implement new strategies to improve student success.

Our objective is to build the pedagogical skills of the mathematics faculty to implement new instructional strategies that will increase the retention and completion rates of students in development and transfer mathematics courses.

<https://mc2.nmsu.edu/>

Contact information

UNM-Taos - Colin Nicholls colnic@unm.edu

WNMU - Tom Gruszka Thomas.Gruszka@wnmu.edu

MC² - Wanda Bulger-Tamez wquzman@nmsu.edu

- Kathe Kanim kakanim@nmsu.edu