George Mason University

GMU COMPLETE MATH:

Center for Outreach in Math Professional Learning and Educational Technology

COS & CEHD

MATH 600: Implementing Mathematics Teaching Practices for Effective Standards-Based Instruction

Summer 2018 Professional Development Outreach Course

Instructors:

Dr. Melissa Gallagher: mxg6401@louisiana.edu

Sara Birkhead: sbirkhea@gmu.edu

Course Organizers:

Dr. Jennifer Suh jsuh4@gmu.edu

Dr. Padmanabhan Seshaiyer pseshaiy@gmu.edu

I. Course Description:

Assessing Mathematical Learning Through Task Design and Implementation

This course focuses on developing and implementing tasks while considering the learning progressions in grades 5-9 through mathematical inquiry.

Meeting dates:

In person sessions: at James Wood Middle School, Winchester, VA from 9:00 am- 3:00 pm

July 23, 24, 25, 26

Online sessions:

Synchronous July 27 (time TBD)

Asynchronous modules due: August 31, September 14, September 28

II. Student Outcomes

At the conclusion of this course, students should be able to:

1. Articulate and enact methodologies for teaching mathematics more effectively to children with various abilities in Grades 5-9, specifically the 8 effective teaching practices from Principles to Actions.
2. Teachers will intentionally plan for the enactment of the practices within individual lessons and across a unit.
3. Teachers will use video to reflect on their enactment of the practices.
4. Teachers will attend to, interpret, and respond to peers' enactment of the practices using a video annotation platform (GoReact).

III. Nature of Course Delivery

The delivery of this course combines methods of seminar, online sessions, active learning, discussion, independent work, student presentation, mathematical problem solving, and writing. The course is designed both in structure and process to engage students in dialogue at the individual, group, and collective levels. Different formats will be used to help build the capacity of the learning community. Readings and lectures will precede and focus class online discussions and interactive forums. This course relies on your willingness to participate in all class and team discussions. You will be asked to complete weekly reading assignments with related problem sets and offer key ideas on how the readings and problems inform professional experience. The syllabus lays out an initial plan for our work and may be revised during the course to meet students' needs and interests. Students are expected to be independent thinkers, intellectually curious, and responsible to each other for the quality of classroom learning. This calls for both purposeful collaborative work as well as deep individual reflection. The course is designed to enhance both of these skill sets. You should expect to spend time between classes reading/viewing/listening to assigned materials, completing assignments, completing reflections, solving problems, and participating in substantive online discussions.

IV. Readings:

National Council of Teachers of Mathematics (NCTM). (2014). *Principles to action: Ensuring mathematical success for all*. Reston, VA: NCTM

V. Course Requirements and Assignments

The assignments across the course are intended to improve your strategies as a mathematics teacher and to develop your skills in fostering rich task design and implementation. All assignments are to be completed on time so that class members might benefit from the expertise and contributions of their colleagues.

1. **Participation & Homework (individual grade, 20%)**
   Class sessions will consist of a discussion of the readings and related problems. Readings are to be completed before each class session. Students are expected to analyze and reflect on the readings and come to class prepared to participate in the discussion. Homework assignments will be given nightly. Students are expected to complete these assignments before class and be ready to share and discuss how problems fit into the state standards and offer the opportunity to highlight particular teaching practices. There will also be two online modules due Aug. 31 and Sept. 28. Discussion board postings and overall participations in these modules will be counted.
2. **Unit Plan (group grade, 21%-due August 1)**

As a grade-level group you will create a unit plan for a unit that you will begin before September 14 in the coming school year. Your unit plan will include a narrative description of the unit, the standards covered by the unit, an overview of the daily activities and tasks in the unit. You will specify at least 5 specific tasks, including the state standards and PtA practices they will highlight. Some of these tasks will be included in detailed lesson plans (part 2 below)

3. **Lesson Plan - Rich Math Task (individual grade, 10% for initial-due August 1, 25% for revised-due September 28)**
   You will individually plan one rich math task lesson that fits within your group's unit plan. The lesson plan should be written in sufficient detail that another member of your group can teach it. After two people have taught and videoed the lesson, you will revise the lesson plan using Track Changes in Word to improve it given what you learned from watching the videos. You will choose three changes to explain your rationale for the change by adding a comment box in Word.
4. **Implementation of 2 Lesson Plans (individual grade, 4%-first due August 25, second due September 8)**
   You will record your instruction of your lesson plan and your partner's. You will post the videos of the lesson on GoReact.
5. **Analysis of 4 Videos (individual grade, 20%-first 2 due August 31, second 2 due September 14)**
   Each person will add comments regarding the teaching and learning analysis to the videos of themselves and their partner.

VI. Evaluation Schema

Determination of the Final Grade:
Graduate Grading Scale

A	93%-100%	B+	87%-89%	C	70%-79%
A-	90%-92%	B	80%-86%	F	Below 70%

VII. UNIVERSITY POLICIES

The university has a policy that requests students to turn off pagers and cell phones before class begins.

HONOR CODE

To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of George Mason University and with the desire for greater academic and personal achievement, George Mason University has set forth a code of honor that includes policies on cheating and attempted cheating, plagiarism, lying and stealing. Detailed information on these policies is available in the GMU Student Handbook, the University Catalog, and on the GMU website (www.gmu.edu).

INDIVIDUALS WITH DISABILITIES POLICY

The university is committed to complying with the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 by providing reasonable accommodations for applicants for admission, students, applicants for employment, employees, and visitors who are disabled. Applicants for admission and students requiring specific accommodations for a disability should contact the Disability Resource Center at 703-993-2474, or the University Equity Office at 703-993-8730.

ATTENDANCE POLICY

Students are expected to attend the class periods of the courses for which they register. Although absence alone is not a reason for lowering a grade, students are not relieved of the obligation to fulfill course assignments, including those that can only be fulfilled in class. Students who fail to participate (because of absences) in a course in which participation is a factor in evaluation, or students who miss an exam without an excuse, may be penalized according to the weighted value of the missed work as stated in the course syllabus (GMU University Catalog, pg. 32).

GMU Policies and Resources for students

Policies

a. Students must adhere to the guidelines of the Mason Honor Code (see http://oai.gmu.edu/the-mason-honor-code/).
b. Students must follow the university policy for Responsible Use of Computing (see http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/).
c. Students are responsible for the content of university communications sent to their Mason email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students **solely** through their Mason email account.
d. Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see http://ods.gmu.edu/).
e. 5. Students must silence all sound emitting devices during class unless otherwise authorized by the instructor.

Campus Resources

f. Support for submission of assignments to Tk20 should be directed to tk20help@gmu.edu or https://cehd.gmu.edu/aero/tk20. Questions or concerns regarding use of Blackboard should be directed to http://coursessupport.gmu.edu/.
g. For information on student support resources on campus, see https://ctfe.gmu.edu/teaching/student-support-resources-on-campus

For additional information on the College of Education and Human Development, please visit our website http://cehd.gmu.edu/.

PROFESSIONAL DISPOSITIONS
Students are expected to exhibit professional behaviors and dispositions at all times.

CORE VALUES COMMITMENT
The College of Education Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles. http://cehd.gmu.edu/values/
For additional information on the College of Education and Human Development, Graduate School of Education, please visit our website [See http://gse.gmu.edu/]

Course and Assignment Schedule

Date	Topic	Readings Due	Assignments Due
7/23 - in person	PtAs of the day – **Establish math goals & Implement rich tasks**		
7/24 - in person	PtAs of the day – **Pose Purposeful Questions & Discourse**	Principles to Actions pg. 1-24 & pg. 29-41	Math Task #1- The Candy Jar Task Complete PtA Survey
7/25 - in person	PtAs of the day – **Representations & Procedural Fluency**	Principles to Actions pg. 24-29, pg. 35-48, & pg. 70-88	Math Task #2 - The Draining Dilemma Record & upload a Act 1 task to GoReact
7/26 - in person	PtAs of the day – **Productive Struggle & Eliciting Student Thinking**	Principles to Actions pg. 48-57 & pg. 89-117	Math Task #3 - Serving Fish
7/27 - work time	Work in Unit Plan teams to develop unit plan		Math Task #4 - Mango Problem (upload to Discussion Board & comment 2 people's)
8/1 - online			Unit Plan Initial Lesson Plan
8/25 - online			Video of implementation of first lesson
8/31 - online	Video Reflection Module (login to BB and participate in online module activities- Open 8/25 to 8/31)		Analysis of first 2 videos (yours and your partner's) Discussion Board posting
9/8 - online			Video of implementation of second lesson

9/14 - online			Analysis of second 2 videos (yours and your partner's)
9/28 - online	Wrapping Up Module (login to BB and participate in online module activities- Open 9/22 to 9/28)		Revised Lesson Plan Discussion Board posting