

The Mathematics Enthusiast <https://scholarworks.umt.edu/tme/>

Call for Proposals Special issue : vol.19, no.3 [July 2022]

Topic: **Mathematics Course-Based Undergraduate Research Experiences**

By invitation only

Guest editors: Diana Cheng, Towson University; John Gonzalez, US Department of Defense

dcheng@towson.edu

TME Editor-in-chief: Bharath Sriraman, University of Montana-Missoula,

SriramanB@mso.umt.edu

Description of issue: This issue will focus on mathematics Course-Based Undergraduate Research Experience (CURE) courses developed by faculty across different institutions. Faculty members will describe their course structure including timeline and major assignments, instructional materials and activities, authentic research experiences provided to their students, and assessment or evaluation strategies. Articles should feature at least these two descriptions:

- An explanation of how the course fits along the spectrum of inquiry / Course-Based Undergraduate Research Experience / Internship with respect to use of mathematical and / or scientific practices, discovery, broader relevance or importance, collaboration, and iteration as defined by Auchincloss et. al. (2014).
- A minimum of one concrete example of undergraduate student research work conducted during the course (the project may have also continued beyond the scope of the course).

Rationale:

Undergraduate research is supported by the Mathematical Association of America and encouraged by many undergraduate institutions of higher learning. There are opportunities for mathematics students to conduct research outside of their regular classroom experiences, such as during summer programs. However, another way of providing students with research experiences is through course-based experiences. Course-based experiences have a potential to increase participation from students in underrepresented groups, such as first-generation college students, non-traditional students, and transfer students. Undergraduate engagement in research can improve student retention by providing higher satisfaction with their education, higher persistence rates in mathematics and science classes, increased odds of positive graduation outcomes, and increased chance of pursuing graduate degrees and post-graduate research opportunities, among other benefits (e.g., Barlow and Villarejo 2004, Bauer and Bennett 2003, Seymour et al. 2004). These experiences can help students develop their identity and self-efficacy as mathematicians.

This issue of TME will help mathematicians learn about how CUREs were implemented by faculty at various institutions. There is a wealth of literature on science-based or engineering-based CURES (e.g., Dolan, 2016), however, there is not yet as much literature on CURES focused on mathematics.

Timeline:

September 2020- Call for Papers
November 2020- Finalize list of authors and papers

First Round (Fall 2020 classes)

March 2021- Receive 1st draft of paper for Fall 2020 classes
June 2021- Submit feedback to authors
Oct 2021- Receive 2nd draft of paper

Second Round (Spring 2021 classes):

June 2021- Receive 1st draft of paper for Spring 2021 classes
July/August 2021- Submit feedback to authors
Oct 2021- Receive 2nd draft of paper

All Authors:

Dec 2021 - Inform authors of acceptance or final revision
Feb 2022- Receive final versions of all papers
April 2022- Formatting and copy editing-
May 2022 - Send files to Editor-in-Chief
July 2022- Issue Release.

References:

Auchincloss, L., et. al. (2014). Assessment of Course-Based Undergraduate Research Experiences: A Meeting Report. CBE-Life Sciences Education, 13, pp. 29-40. <https://www.lifescied.org/doi/full/10.1187/cbe.14-01-0004>

Barlow, A. & Villarejo, M. (2004). Making a Difference for Minorities: Evaluation of an Educational Enrichment Program. Journal of Research in Science Teaching. 41. 861 - 881. 10.1002/tea.20029.

Bauer, K. W., & Bennett, J. S. (2003). Alumni perceptions used to assess undergraduate research experience. The Journal of Higher Education, 74, 210-230.

Dolan, E. L. (2016). Course-based undergraduate research experiences: Current knowledge and future directions. Washington, DC: National Research Council. Retrieved from https://sites.nationalacademies.org/cs/groups/dbassesite/documents/webpage/dbasse_177288.pdf

Seymour, E. & Hunter, A. & L. Laursen, S. & DeAntoni, T. (2004). Establishing the benefits of research experiences for undergraduates in the sciences: First Findings from a three-year Study. Science Education. 88. 493 - 534. 10.1002/sce.10131.