Improving Course Alignment, Teamwork, and Understanding of Biological Applications in CBEN 110 FUNDAMENTALS OF BIOLOGY

C. Josh Ramey, Ph.D., Teaching Assistant Professor, Chemical and Biochemical Engineering

My teaching focuses on providing undergraduates with unique learning experiences that engage their curiosity and expand their understanding of what is possible in modern biology. I am excited about increasing undergraduate participation in primary research.

Increasing Course Alignment

• Redesign specific learning opportunities to support student mastery of learning objectives based on assessment
• Make sure activities learning objectives support course learning outcomes and align with assessment

Intended outcomes

• Students have a clear understanding of course expectations and how activities relate to learning outcomes
• Increased student learning as measured by validated concept inventories
• Build connections between multiple disciplines

Improving teamwork during group interactions

• Studio biology is a collaborative environment in which students are always working in small groups of 3 or participating in class discussions.
• Design new activities and provide additional resources focused on team dynamics during the the first week of class , allowing students to form highly functional teams.

Intended outcomes

• Increased individual student performance
• Increased engagement and reduced time spent off-task
• Students develop community both inside and outside the classroom
• Increased ownership of learning

Why Biology is Important for Colorado School of Mines.

• Currently over 30 faculty at CSM are involved with biological education or research.
• Women are highly represented in biological sciences.
• Broad applications of biological knowledge

Increasing student awareness of how biological knowledge can be used to solve engineering problems in novel ways

Utilizing the support of the Hive at the Trefny Center, I am developing videos featuring Mines faculty whose research involves biologically relevant topics.
• John Spear - Microbial form, function, and application
• Keith Neeves - Fluid dynamics of blood flow and the effect on clotting
• Anne Silverman - Musculoskeletal biomechanics
• Nanette Boyle - Genetic engineering of photosynthetic organisms for chemical production

In the future, I would like to expand this video series to include more Mines faculty as well as alumni.

Intended outcomes

• Increased student participation in biological related minors at Mines
• Increased student participation in undergraduate research (REUs)
• Increased participation in biology related careers

• Intended outcomes

“Active learning should be the central dogma of science education.”
“Freeman et al, 2014

June 2016 Cohort