

Creating a “STEAM Team” for a First-Year Engineering Program Pilot Course
Dr. Olivia Burgess and Dr. Alina Handorean
Colorado School of Mines

ABSTRACT

Dr. Alina Handorean of the Engineering, Design, & Society Division and Dr. Olivia Burgess of the Humanities, Arts, & Social Sciences Division of the Colorado School of Mines will share their experiences and insights related to co-teaching a first-year course linking engineering design with writing, ethics, and the humanities. The presenters developed a highly effective teaching partnership that led to three years of intensive collaborative teaching and future plans to develop and co-teach other courses merging engineering with perspectives from the humanities. The presenters were originally paired by administrators, creating what Mary-Jane Eisen refers to in “The Many Faces of Team Teaching and Learning” as a “blind date” system that has the potential to lead to a “committed marriage” or “one-night stand.” Fortunately, the presenters developed a “committed marriage” partnership characterized by compromise, flexibility, and a shared pedagogical approach, along with a deep appreciation for what it takes to make a co-teaching partnership effective both in and out of the classroom. The presenters will offer their perspectives on the potential rewards of the co-teaching experience, as well as potential pitfalls to avoid along the way.

FOCUS

The purpose of this workshop is for the presenters to share their experiences in interdisciplinary collaborative teaching. The presenters will discuss how they worked together over the course of a year to co-develop and collaboratively teach a first-year course combining engineering design, writing, ethics, and perspectives from the humanities. The presenters will outline tips for building a successful teaching partnership and co-designing curriculum promoting “STEAM” integration in engineering education.

LEARNING OBJECTIVES

Participants will be able to:

- Identify effective strategies for building teaching partnerships
- Understand the possible pitfalls and rewards of collaborative teaching
- Engage in conversations about how to achieve “integration” across disciplines
- Build a greater awareness of innovative strategies for “STEAM” curriculum design

INSTRUCTIONAL STRATEGIES

This engagement session will include a brief informative talk by the presenters followed by group discussion on creating effective collaborative teaching partnerships.

OUTLINE

This will be a 60 minute session. The talk will begin with an overview of the presenters' experiences in collaborative teaching and curriculum development, including an overview of different approaches designed and implemented while collaboratively teaching a first-year engineering pilot course on the Grand Challenges of Engineering. The presenters will guide a group discussion on best practices for creating both effective teaching partnerships and effective interdisciplinary programs in engineering education.

RMS ASEE TARGET AUDIENCE

Interested participants will include any who have or may want to teach collaboratively, and/or participants who are interested in collaborating across disciplines. This session may also be of interest to anyone curious about interdisciplinary teaching and/or curriculum development, especially in STEM and humanities integration.

PRESENTER CREDENTIALS

Dr. Olivia Burgess is a Teaching Associate Professor in the Humanities, Arts, & Social Sciences Division whose teaching focuses on linking her background in the humanities to engineering education. She teaches courses in writing, engineering ethics, science fiction, and "STEAM" curriculum that link engineering design and the humanities. Dr. Burgess earned her B.A. in English from Texas State University-San Marcos before earning both her M.A. and Ph.D. in English from Texas A&M University. Before joining the Colorado School of Mines, she taught writing and literature courses as a Teaching Assistant Professor for Missouri University of Science & Technology. In addition to teaching at Mines and helping to establish two different first-year "STEAM" programs, she also directs Nature & Human Values, the first-year program in writing and engineering ethics. She has published on Fight Club, science fiction film, online writing pedagogy, and, most recently, the use of literature to teach ethics in a STEM curriculum.

Dr. Alina Handorean is a Teaching Associate Professor in EDS with more than 20 years of experience teaching a wide range of biology, chemistry and fundamental environmental engineering classes at the middle school through graduate levels. Dr. Handorean earned her B.S. and M.S. degrees in Biochemistry and Molecular Biology from the University of Bucharest,

Romania and her M.A. and Ph.D in Chemistry from Washington University in St. Louis before completing a post-doctoral fellowship in cancer biology at the University of Colorado's Health Sciences campus. Prior to joining Mines, Dr. Handorean was a Research Faculty/Lecturer in the Civil, Environmental and Architectural Engineering at University of Colorado, Boulder. Her research interests are Environmental Engineering (Drinking Water, Bioaerosols), Chemistry, Cancer Biology, and Pedagogy, and she is passionate about teaching user-centered design, communication skills, and teamwork in her Design Cornerstone classes.

Dr. Handorean' research efforts translated into numerous published articles and conference proceedings in the field of cancer biology and air quality, both nationally and internationally.

Outside EDS, Dr. Handorean is a member of the Colorado School of Mines Faculty Senate, the chair of the Leadership Nomination Committee, the co - chair of the Evaluation Taskforce for Effective Instruction, and serves a member of the University's Assessment Committee and the Diversity, Inclusion and Accessibility Council at Colorado School of Mines.

REQUIREMENTS

What materials/handouts will you bring? We will bring handouts.

Do participants need to bring anything? e.g. laptop Participants do not need to bring anything.

What are your intended (ideal) and max participant counts? 15-25 would be ideal to facilitate productive discussion.