

- Workshop title:
  - Designing and Implementing Oral Exams: How to Make Them Work and How They Can Positively Impact Your Course

## **Objective**

The objective of this workshop is to provide participants with evidence-based information and resources on how to implement oral exams in engineering courses to make a positive impact on student learning. Based on results from a three-year National Science Foundation (NSF)-funded research project, we will share the benefits and challenges of implementing oral exams in engineering classes, as well as lessons learned regarding the design and implementation of oral exams. Our goal is to provide participants with tools and resources for consideration when implementing oral exams in their own contexts.

## **Description**

Oral exams as a testing tool date back to ancient times, and have many potential benefits. The adaptive dialogic nature of oral exams provides instructors an opportunity to better understand students' thought processes, and thus, hold promise for improving both assessment of conceptual mastery and understanding of students' approaches to and attitudes toward learning. However, oral exams are more than an assessment tool. The one-on-one interaction between students and the instructional team during oral exams has the potential to positively impact instructor-to-student interactions and increase students' self-efficacy and motivation toward learning.

Designing and implementing oral exams, however, can be challenging. For example, issues of reliability, validity, and scalability to larger class sizes have often been cited as potential barriers to implementation. However, these can largely be mitigated by careful design. Compared to traditional written exams, oral exams have a unique design space, which involves a large range of parameters, including: types and level of difficulty of questions, grading criteria, how oral exams are administered, how feedback is provided, and other logistical considerations such as the weight of the oral exam in the overall course grade, scheduling, and frequency. As with any assessment format, careful design is needed to maximize the potential benefits to student learning. Participants in this session will have an opportunity to learn about these various design considerations and consider how they might implement oral exams as a powerful learning and assessment tool.

At the University of California San Diego (UCSD), we have conducted a three-year NSF funded project to understand how we can use oral exams to advance engineering students' learning. The research team are 16 faculty, research staff and students from various Mechanical and Aerospace Engineering, Electrical and Computer Engineering, Computer Science Engineering, and Psychology department and Teaching and Learning Commons. We have administered oral exams to over 3500 engineering students in 9 Mechanical and Aerospace Engineering and Electrical and Computer Engineering courses. In this project, we investigated various design

and implementation considerations to maximize the benefit of oral exams as an assessment tool, an intervention to promote deep learning, and a learning activity to increase students motivation and self-efficacy. To address the scalability challenges, we also developed training materials to prepare assessors to adopt equity mindset and proper techniques to communicate with students during oral exams. We also explored how to better prepare students for oral exams, both mentally and technically.

In this workshop, we will: 1) Share findings from a three-year NSF-funded study on the impact of oral exams that have been implemented in several engineering courses multiple times over the three years; 2) Describe various oral exam implementation models; 3) Discuss the challenges and benefits of oral exams in different contexts; 4) Review oral exam training modules developed by the team to ensure equity-mindedness when administering oral exams; and 4) Engage participants in small group activities to consider applicability of oral exams in their contexts.

Workshop presenters will provide participants with concrete examples of how oral exams can be administered, including guidelines on the types of questions, how to guide interactions with students, how to provide effective feedback, and how these assessments can be used as touch-points for how students are learning in the course. Presenters will also lead participants through a series of questions and small group activities to apply oral exam strategies discussed throughout the workshop.

#### Workshop Schedule:

1. Benefits of oral exams: findings from our study -20 minutes
2. Challenges of oral exams - 10 minutes
3. Design and implementation dimensions and design parameters of oral exams- 30 minutes
4. How to prepare students for oral exams - 10 minutes
5. "Design your own oral exams!" group activity - 20 minutes