

Collaborative Learning Pedagogy and Content Analysis Training

Autumn 2024 Syllabus

Key Information

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Training Program Description

The training program is designed to support the graduate Teaching Assistants and undergraduate Lead Junior Tutors in the CALC program (revamping the Tutorial program), which supplements the Elementary Function and Calculus (Math 131-132-133) sequence.

The aim is to provide a formal education in evidence-based Collaborative Learning pedagogies, enabling participants to:

- Apply a Purpose - Process - Product method to address classroom challenges effectively.
- Identify the behaviors and attitudes necessary for promoting a safe learning environment and successful academic teamwork.
- Implement various roles that are instrumental for productive small-group learning interactions.
- Refine observation skills to recognize student behaviors as evidence of learning.
- Structure small group activities and engaging presentations that enhance student learning.
- Confidently facilitate discussions by asking appropriate leading and follow-up questions during the tutorials.

Orientation Week Boot Camp

Collaborative Learning Orientation Boot Camp	Sep 28	1 - 4:30 pm
	Sep 29	1 - 4pm

Before the weekly training begins, LJTs will attend a two-day Collaborative Learning Orientation Boot Camp on Saturday and Sunday before the Autumn Quarter starts. This orientation will introduce the underlying theoretical foundation of collaborative learning, including constructivist learning theory, Bloom's taxonomy, and cognitive

load theory. Additionally, the orientation will cover the specifics of the CALC tutorials and the role of a Graduate Teaching Assistant or Lead Junior Tutor within this framework, ensuring participants are well-prepared and confident in their responsibilities.

Weekly Training Meetings

Pedagogy Workshop	Monday	1:30pm-2:20pm	Eckhart 206
		5:30pm-6:20pm	Eckhart 207A
Content Analysis Workshop	Friday	4pm-6pm	Eckhart 117
	Sunday	10am-12pm	Eckhart 117

The pedagogy workshop component will focus on training participants in collaborative learning pedagogies. In preparation for the workshop each week, the Lead Junior Tutors will need to:

- Submit a reflective journal entry after their Collaborative Learning tutorials.
- Update student attendance/participation records.
- Read and reflect upon any assigned reading which provides the foundation for the week's pedagogical topic.

During the workshop, LJTs will explore evidence-based pedagogical philosophies that motivate collaborative learning and develop the skills necessary for successful tutorials.

The problem set analysis workshop consists of two essential parts. First, LJTs will examine the weekly tutorial problem set from their students' perspectives, identifying potential complications, common mistakes, and multiple approaches to the solution. Second, LJTs will strategize on how to lead their students effectively during the tutorials, discussing task alignment with course learning goals and developing leading and follow-up questions for the upcoming sessions.

Assessment

The Lead Junior Tutors will be observed by the GTAs or the instructor and provided written feedback about their performance.

Credit/Grading

There is no credit or grading associated with the training. Since this is an integral part of the job duties of a Lead Junior Tutor, participants are expected to be present at all training workshops. Failure to attend or make up multiple training workshops per quarter will result in reports to the co-directors of Undergraduate Studies in the Math department.

Planned Content for the Quarter

Orientation Week - Active Practice: The First Tutorial

During the second day of the orientation week boot camp, LJTs will practice facilitating segments of the first CALC tutorial. LJTs will learn to

1. establish their authority in the classroom, convey tutorial expectations and policies,
2. motivate students to engage in this non-traditional classroom format, and
3. institute standard classroom procedures. These include assigning small groups and roles within the groups, facilitating discussions without providing answers, and guiding group presentations.

Week 1

No meeting on Monday. Regular meeting on Friday.

Week 2 - Purpose, Process, Product - Utilizing the Manager role

In this week, LJTs will reflect on the challenges and successes reported in their written reflections from the previous week's tutorial. Through guided mentorship, participants will learn to apply the 3P method (Purpose, Process, Product) to address classroom challenges effectively. The two most common challenges identified in the reflections will be selected, and LJTs will create a 3P solution to implement during their next workshop. Typically, the most common challenge is the lack of equitable student-to-student collaboration among team members, so this session will often focus on utilizing the Manager role to foster a more balanced and productive group dynamic.

Week 3 - Refining Observation Skills to Recognize Student Behaviors as Evidence

This week, LJTs will refine their ability to observe and document student behavior as evidence of learning. The session will begin with some case studies, allowing participants to practice identifying key behaviors that indicate student understanding. Through a Think-Pair-Share activity, LJTs will compare observations with peers to better distinguish evidence from interpretation. Next, LJTs will review their reflections, focusing on how well specific, observable behaviors were cited. Finally, participants will sign up for peer observations, where they will complete forms focused solely on documenting evidence, thereby enhancing their ability to gather useful insights for improving tutorial effectiveness.

Week 4 - How to Approach Longform Problems

We will discuss the steps required to solve long-form word problems and brainstorm specific leading and follow-up questions (using that week's problem set) that can be used to engage teams that have skipped parts of or are stuck in this problem-solving process. Participants will identify the cognitive skills these questions require and describe how the role structure within the groups can support the problem-solving process when the Lead Junior Tutor is not directly engaging with the team. Additionally, LJTs will devise a 3P plan to ensure that teams intentionally engage in the full problem-solving process.

Week 6 – Identifying Learning Goals through Strategy Analysis

Using a problem from that week’s problem set, we will attempt to identify general, transferable problem-solving strategies rather than specific solution steps, thereby promoting conceptual learning over algorithmic memorization. Lead Junior Tutors will divide into two groups and practice presentations that focus on explaining the conceptual fundamentals of problems (e.g., the “why”). They will also brainstorm ways to keep the audience engaged during their presentations.

Week 7 - Effective Presentations – Spokesperson Workshop

During this workshop, Lead Junior Tutors will brainstorm and identify behavioral evidence of engaging presentations that enhance student learning. The session will focus on specific actions that can be used by Lead Junior Tutors to facilitate more engaging and effective presentations. Participants will create a 3P plan for enhancing their presentation skills.

Week 8 - Facilitating Discussion – Asking Questions

Students will read a chapter from the MAA Instructional Practices guide for designing questions to facilitate meaningful discussion. Using this framework, following up on the Week 4 workshop, Lead Junior Tutors will brainstorm specific leading and follow-up questions (using that week’s problem set) that can be used to engage teams that have skipped parts of or are stuck in the problem-solving process. Participants will identify the cognitive skills their questions probe within the context of Bloom’s Knowledge Domain and design questions that prompt students to engage in higher-order learning skills, promoting meaningful learning beyond rote memorization.

Week 9 - Final Workshop and Reflection

We will discuss end-of-quarter planning and administrative details, including attendance records and soliciting student evaluations/feedback. Lead Junior Tutors will assess their progress and make S.M.A.R.T. goals for their transition to the Winter Quarter.

Week 3 - Creating a Safe Learning Environment and Encouraging Student Participation

This week, LJTs will continue to build on the reflections from the previous session, particularly focusing on their first 3P exercise. The workshop will involve discussions on how to create a safe learning environment where students feel comfortable taking intellectual risks in front of their peers. Strategies will include using icebreakers to build rapport, framing student mistakes as valuable learning opportunities, identifying low-stakes opportunities for quieter students to contribute, and supporting students during presentations by directing clarifying questions to the audience, rather than the presenter.

