When a curricular model proves to be potent in increasing success, how can other departments implement it? The first part of the seminar will describe how the Chemistry Department at Duke University has created a successful model that improves persistence and retention in STEM by developing pathways for all students. The greatest increase in retention has been for women in traditionally underrepresented groups (UR), who have experienced a greater than 50% increase in graduation with a major or minor in chemistry since implementation of the new model a decade ago. A longitudinal study of nearly 11,000 students revealed that an UR woman is now more likely to graduate with a major or minor in chemistry than the overall population even if her SAT math score is in the lowest quartile of her matriculating class. This was accomplished using high school background information and an assessment quiz to place students into one of four initial gateway courses tailored for various levels of experience. Even when students are correctly placed based upon their previous experience, educators should strive to understand the interplay between different classroom pedagogies and the beliefs about knowledge and learning held by their students. This second part of this seminar will present a comparison of survey data for learners in two different types of first-semester organic chemistry classrooms: an active learning format classroom and a predominantly lecture-based classroom. Students in both types of classrooms completed surveys assessing their personal epistemology (beliefs about knowledge and how it is formed) and perceptions of constructivism in the classroom at three time points during the semester. One of our goals in this experiment was to examine relationships, if any, between epistemic beliefs and epistemic climate (classroom pedagogy) in an authentic, semester-long learning environment. Using a quasi-experimental design, we evaluated the effects of epistemic climate (passive lecture versus active/constructive) on students’ perceptions of constructivism and changes in personal epistemology over time. We also tested the alignment hypothesis: that students will perform better on assessments when their beliefs align with the pedagogy employed by the instructor. Findings support an interactive model between students’ personal epistemology and epistemic climate and highlight the challenges of changing epistemic beliefs through short-term classroom interventions.

Professor Canelas has been active in implementation of student-centered pedagogies and developing programs to increase undergraduate retention in science tracks. Research interests include chemical education research and the scholarship of teaching and learning as well as macromolecules for industrial and biological applications, such as microelectronics, coatings, membranes, gene therapy delivery, and blood compatibility.}

Information: [https://z.umn.edu/CanelasDorian](https://z.umn.edu/CanelasDorian)
Link to Zoom: [https://umn.zoom.us/j/420174769](https://umn.zoom.us/j/420174769)

Host: Professor Angela Perkins
Refreshments will be served prior to the seminar.
Visit: [chem.umn.edu/chemistry-events](chem.umn.edu/chemistry-events) for a schedule of upcoming seminars.