Mastery-based assessment is an assessment scheme that encourages students to learn from their mistakes and develop an understanding of material before moving on. For an entry-level course with large enrollment like College Algebra, this could allow some students to move at an appropriate pace for themselves, improving their learning gains throughout the semester, while simultaneously allowing stronger students to push on toward new concepts. In this talk, I’ll describe the changes I made to make College Algebra at the University of Florida an asynchronous mastery-based course for the 1000+ students who take the course per year and describe how I addressed the numerous pitfalls that appeared along the way, focusing on how to effectively implement a mastery-based course for a large-enrollment hybrid or fully online course. (Received September 16, 2019)