DFW rates in Applied Calculus were on the rise and students who passed this course had a low graduation rate; students identified as at-risk were more likely to fail and need to re-take the course. Faculty consensus on a number of key components of the course, both with respect to documents and policies, enabled us to modestly lower the DFW rate and greatly improve the overall performance of students through a course redesign. Through this process, we found a strong link between student mindset, first exam performance, and final course grades; this, in turn, informed the course redesign process. A combination of approaches was used to address the overall issues with the course, helping students build better study and learning habits of mind, and working with faculty to include more research based pedagogical methodologies in order to build students’ overall conceptual understanding. Resources on growth mindset, teaching students to learn, and active learning were used for the course redesign. The combination of mindset analysis and determining course grade component correlations is crucial to ferreting out the issues in an individual course and/or across an entire department. (Received September 17, 2019)