SUNY Cortland
Physics Department

RE: Observation of Eric Edlund's Classical Mechanics class on Nov. 14, 2018
Eric Edlund invited me to attend his classical mechanics class and provide feedback. Here are my observations.:

Eric started the class with a recap of the following lecture and identified it as being the culmination of a larger arc in the sweep of the course. In today's course he intended to determine the change in orbit needed to shift from a shared circular orbit for two space vessels (a spaceX dragon module, DM, and the international space station, ISS) around the earth to an orbit that caused the two vessels to intersect. The recap was largely mathematical in nature. This may have been helpful to the students who attended the last class but may have been less useful to a student who had missed a day and was returning, a bit more of an interpretation of which of the things were important and why could have been helpful.

Eric then set-up the mathematical framework for the two vessels, namely $r_{ISS}(\theta_{ISS})$, $\theta_{ISS}(t)$, and $r_{DM}(\theta_{DM})$. And showed graphically the new path he sought for DM. He also defined the relevant parameters in the framework connecting them to the previous lectures and to the change in velocity that would be needed to reach the new orbit with particular emphasis on the eccentricity of the new orbit. He also emphasized that the interception event requires the crafts to reach the same place at the same time and set out to perform the necessary integral, what was important about that integral (i.e., it is unusual to have the limit of the integral be what is sought) and to detail some of the trick that help simplify the integral and how the situation at hand was consistent with those simplifications. His derivation was clear, organized and well supported. There was much that was good in this lecture.

I have some suggestions based on what I saw. One concerns the use of graphs on the board. There was a point where Eric made two graphs that were meant to be compared with each other however their scales (especially the horizontal) were not consistent and so they didn't line up. Fixing this is a simple thing that can make a big difference in how easy it is for student to interpret what they are seeing. To be fair these graphs were made to respond to a student question and not part of his prepared class.

Also in regard to student questions there was a point where a student asked a question and after a brief exchange you moved on without the student reaching clarity in an effort to reach your intended destination in the lecture within the time constraints. It is a hard call to decide when this is the right approach and when you risk losing the student. I generally believe that student questions are like icebergs, you only see a small portion of them because most of the students just sit on them.
Near the end of the same class session you said it was okay if not everyone understood everything and also "Maybe there is something to rocket science being hard." Given the diverse set of goals that our students have these sentiments are to be lauded in an instructor, aiming to challenge everyone in the course and to make clear that some of the material can be considered beyond the requirements of the course. I would however recommend that care be used to try to make these statements in the

Bowers Hall, Room 144 • P.O. Box 2000 • Cortland, NY 13045-0900
Phone: (607) 753-2821 • Fax: (607) 753-2927

positive (e.g., we have covered many topic today, x, and y, are the most crucial to understand for this course and I've also presented z to give something to stretch to). I applaud you for pointing out where you have found things to be difficult.

While there is room for growth I considered the lecture to be a valuable one and appreciate that you gave me the opportunity to observe this course and hope that you will do so again in the future.

Sincerely,

Douglas Armstead
Assistant Professor of Physics
SUNY Cortland