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| **CLOs with descriptions** | Accomplished | Proficient | Developing | Beginning |
| **Measurement**  ***LCC’s “think critically” CLO: identify and define key issues; find and cite relevant information*** | Measurements attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are recorded well (clearly, concisely, etc.) | Measurements attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are recorded. | Measurements attempted are either unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem. | Measurements are attempted but are both unsuccessful and are not comprehensive and/or recorded inaccurately |
| **Application** *Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data (illustrate/prove the theorem: force to compress is proportional to the distance—it's linear)*  ***LCC’s “think critically” and “apply learning” CLOs: apply skills, abilities, theories or methodologies to solve problems*** | Uses the analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from using Hooke’s law (can elegantly explain how deformation is a function of force + distance) | Uses the quantitative analysis of data as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions from using Hooke’s law (is able to explain how deformation is a function of force + distance) | Uses the quantitative analysis of data as the basis for workmanlike (without inspiration or nuance, ordinary) judgments, drawing plausible conclusions from using Hooke’s law (can mostly explain how deformation is a function of force + distance) | Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is hesitant or uncertain about drawing conclusions from using Hooke’s law. (Unable to explain how deformation is a function of force + distance) |
| **Translate into Visuals**  *Ability to convert relevant information into a mathematical form: create a graph/visual to represent results of measurements*  **“Communicate Effectively” CLO:** ***Create and express******messages with clear language and nonverbal forms appropriate to the audience and cultural context*** | Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding. Graph is elegant and accurate. | Competently converts relevant information into an appropriate and desired mathematical portrayal. Graph is correct. | Completes conversion of information but resulting mathematical portrayal (graph) is only partially appropriate or accurate. | Completes conversion of information but resulting mathematical portrayal (graph) is inappropriate or inaccurate. |
| **Analyze and** **Explain**: Use metallurgical forms and language to hypothesize the effects of stress and distance on a given material.  ***LCC’s “apply” & “Communicate Effectively” CLOs: use mathematical and quantitative reasoning to solve problems; create and express messages in language appropriate to the task*** | Accurately and elegantly explains the data shown in a graph and makes reasonable predictions regarding what the data suggest about future events (how applied force affects a bridge or skyscraper, for example, given the properties of a particular material used for the bridge). | Accurately explains the data shown in a graph (how applied force affects a bridge or skyscraper, for example, given the properties of a particular material used for the bridge). | . Somewhat accurately explains trend data shown in a graph, but may fail to accurately hypothesize how applied force affects a bridge or skyscraper, for example, given the properties of a particular material used for the bridge. | . Attempts to explain how applied force is relevant for other structures, but will frequently misinterpret or misapply the formula, given the properties of a particular material chosen in the bridge or skyscraper |