Rubric for student outcome 1e: Finalized Computational Tool and Design Report

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|  | **Performance Indicators** | **Below standard** | **Meets standard** | **Above standard** | **Exemplary performance** |
| 1 | Functionality of computational tool | Code fails to run or run correctly; it either does not compile or has runtime errors. | Code runs and shows correct logic for 1D FEM. Stress and buckling analysis are present. Runtime errors may occur. | Code compiles and runs properly, providing reasonable results. Analysis of stresses, buckling, and cost may be absent. | Code compiles and runs properly; results are feasible. Analysis of other important factors such as stresses, buckling and cost are present with supporting figures. |
| 2 | Safety of Structure | Report does not discuss factors relevant to determining safety. | Report discusses relevant factors to determining safety with supporting arguments from computational analysis. Structure may not meet all requirements. | Report displays figures and discusses data demonstrating necessary factors to determine safety. Structure may not meet all requirements. | Report displays figures and discusses data proving safety of structure. Results are analyzed and explained with regard to relevant points in the structure.  |
| 3 | Design Justification & Optimization | Report does not provide evidence supporting design choices. | Report provides evidence supporting design choices; shows some evidence of optimizing. | Report supports design choices and optimization is present. Both design choices and optimization process are discussed. | Report discusses and explains all design choices. Optimization is evident with figures and/or data demonstrating the extent of optimization.  |
| 4 | Report Presentation / Coherence | Report does not follow a structured format; different sections are disjointed. | Report shows evidence of structure. Different sections are well explained but not related fluidly. Facts and figures may not be explained or annotated. | Report structure is well defined and provides a clear structure definition. Sections transition from one into the next. Facts and figures are annotated or explained. | Report structure is evident and sections are all easily related. Structure description is comprehensive and all facts and figures are thoroughly explained and related to the structure.  |
| 5 | Representation in Society (Curiosity & Project Engagement) | Little to no regard to factors outside of basic mechanical needs are considered.  | Due consideration has been given to mechanically relevant factors and client elements (cost, aesthetic).  | Provides evidence of interest in the impact of structure on its surroundings and client considerations; expresses this through mechanical considerations. | Evidence of interest in the modularity of the structure, client needs, and impact on surroundings. The overall effect of the structure on society is considered and is connected to mechanical needs.  |