*NucE 497: Fuel Performance*

**Academic Integrity statement regarding Jacob Jayne, Cody Smith, and Matthew Collins on Exam 2**

In grading Exam 2, I found many similarities between the exams of five students that made me suspect that they had worked together on the exam. The most notable similarities were in the mistakes they made while taking the exam.

The exam is given online using Canvas, where there was a period of three days to take the exam, but once it was downloaded they had two hours before they had to upload their completed exam. All students were given the same exam. The exam was open note and I emphasized on the exam description that it should be taken alone. I did not ask them to turn in any study material.

The first problem was a short answer problem relating to a figure that was provided with five points that had to be discussed. There were differing levels of similarity depending on the students. There were two things all five had in common. First, on point 3 they all mentioned fission gas moving to voids and grain boundaries, which was not mentioned by any of the other 32 students. Second, on point 5 they all made the mistake of not mentioning that the temperature increased during this period or explaining why. Jacob, Matthew, and another student had many more similarities, making the same mistakes and getting the same score. On point 1, the three used the phrases “fuel temperature rises drastically” and “Plots show rise in temperature and decrease in gap width.” On point 2 they all used “fuel pellets fracture” and used “gap width increases due to densification” or “due to densification, the gap width increases.” The three also said “cladding is still not effected”. I mentioned point 3 previously. In point 4, they all use “swelling due to fission products” and “fuel and cladding creep” or something similar. On point 5, they use variations of “fuel is at end of life”, “expansion of the pellets has reached cladding,” and all mention cladding corrosion and fracture.

The second problem was a workout problem with three parts. They all got the right answer on part a and these three students had answers that were *identical* (8.943e-17). On part b, they all made the same mistake and all got *exactly* the same wrong answer (1.685e20). None of the other 32 students make this mistake. On part c there were two acceptable approaches. Three of the five students took one acceptable approach (including Matthew and Jacob, who both got 379.93) and Cody and another student took the other acceptable approach.

The third problem was a workout problem with four parts. On the first part, they all got the right answer to within two decimal points with very similar work (17.87…). On the second part they all made the same mistakes and got exactly the same wrong answer. On the third part they all got the correct answer. However, I provided two ways to answer this question in class. One was more involved, requiring calculating various intermediate values, while the other was a single equation in which you plugged values. Most of the students in the class used the equation, as it was much more straightforward. These five students all used the more involved approach and all arrived at the same final answer and the same values for the intermediate values. The fourth part was a drawing. Matthew, Cody, and one of the other students all had drawings that looked very similar and had the same mistake.

The fourth problem was a short answer problem with three parts. The exams had fewer similarities on this problem.