SUNY Cortland
Mathematics Department

January 28, 2020

To: Dr. Nicholas Packauskas
From: Dr. Jolie Roat
RE: Classroom Observation

On November 6, 2019, I had the pleasure of observing Dr. Packauskas teach a section of Linear Algebra (MAT 272). The lesson given was organized, well-presented, and included frequent student interaction.

Lesson Summary

I arrived to the classroom ten minutes before the class was scheduled to begin. Dr. Packauskas had already arrived to the room and was preparing for the day's lesson. As students arrived they were greeted by Dr. Packauskas and, unprompted, began rearranging the desks to face the back of the room where the larger white board was located. It was clear this was a frequent occurrence and students understood this expectation. Class began promptly at 1:50pm with a reminder of an upcoming written homework assignment. Twenty students had arrived by the start of the class, with one additional student arriving a few minutes late.

The lesson began with a fifteen-minute review of what they had covered the last few days. Dr. Packauskas began by reminding students that given a finite dimensional vector space, V, choosing a basis $\mathcal{B}$ with n elements will define an isomorphism from V to $\mathbb{R}^n$. Additionally, he wrote the definition of $[\mathbf{x}]_{\mathcal{B}}$, the coordinate vector of $\mathbf{x}$ in V given the basis $\mathcal{B}$, on the board. The first example Dr. Packauskas worked through involved finding the vector $\mathbf{x}$ in $\mathbb{R}^2$ given a basis $\mathcal{B}$ and a coordinate vector $[\mathbf{x}]_{\mathcal{B}}$. He used the statement of the problem to remind students of how we knew the given basis was, in fact, a basis. Throughout the example, Dr. Packauskas encouraged student input, both by asking what the next step was and by frequently pausing to answer student questions. Questions included what happens if the vector space changes and what if we already know what $\mathbf{x}$ is?

The second example of this review used the vector space $\mathbb{P}_1$ and asked students to find the coordinate vector of a given vector and basis. Again, student input was encouraged and Dr. Packauskas made a point of drawing parallels between this problem and the formal definition, still written on the board. When student questions started centering around doing more examples similar to the homework problems, Dr. Packauskas transitioned the class to a prepared packet of examples for the students to work on in groups.

Students were tasked with forming their own two to four person groups and to begin working on a packet containing six problems. While students were working, Dr. Packauskas circulated

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throughout the room answering questions. He left the two examples from the review on the board and frequently referred the students to them, asking students to identify similarities between the problems on the board and the problems in the packet. The first three problems in the packet involved either finding the coordinate vector given a vector space, basis and vector, or finding a vector given a vector space, basis and coordinate vector. After about twenty minutes, Dr. Packauskas called the class back together to discuss strategy for the third problem, which dealt with the vector space $\mathbb{P}_2$. He went through the set up of the problem and asked a group that had completed it to contribute their answer so that students could check their work once they went through the computations on their own.

With just under ten minutes remaining in the class, Dr. Packauskas began instructing students on the process of finding bases, the focus of the remaining questions in the group packet. He began by reminding students that they already knew how to do this for two specific examples: Col A and Nul A. He then worked through the beginning of one example, before drawing the connection of finding a basis for a subspace of $\mathbb{R}^n$ to finding the column space of a matrix. The class ended promptly at 2:40pm with one last reminder of the assignment due the next class.

Conclusions:

Dr. Packauskas presented a lesson to students that was well thought out and organized in a way that encouraged students to draw connections between examples, modeling useful problem solving strategies. The group work provided students with some time to assess their knowledge and find gaps in their understanding. While Dr. Packauskas was very good at answering questions that were asked, I encourage him to also initiate conversations with groups that are not asking questions. This can serve to bring off task groups back to the lesson as well as provide opportunity to groups without questions to dig deeper into the material.

Overall, an excellent lesson!

Respectfully submitted,

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