President Hinton, Prioress Hedican, distinguished members of the platform party, faculty, staff, and returning students, welcome back. To the incoming class of 2020, WELCOME! I hope you all had an enriching, rewarding, and energizing summer.

My summer was filled with lots of travel, sports, and family time. I also spent a good amount of time preparing for this academic year by reading and thinking about the process of teaching and learning. One of the books I read was *How We Learn: The Surprising Truth about When, Where, and Why It Happens* by Benedict Carey, a New York Times medical and science columnist. In the book, Benedict Carey sifts through decades of research on learning and comes to an interesting conclusion. That is, many of the common assumptions about how we best learn are just plain wrong. However, what also made this book particularly interesting for me were the parallels I was able to draw between the optimal learning strategies, as described by Mr. Carey, and the fundamental principles of exercise program design, which we talk about in several Exercise Science and Sport Studies courses. So, in the spirit of the recent Olympic Games, I want all of you to think of yourselves as athletes participating in the sport of academia and preparing for your Olympic competition. During the next few minutes, I am going to give you a crash course on how to design a training program to enhance your performance as an academic athlete. Specifically, I am going to talk about the principles of progressive overload, variation, and recovery.

**Principle #1: Progressive Overload.** In exercise science, the principle of progressive overload states: in order for strength to be gained or performance to increase, the human body must engage in physical activity that is more than what it is accustomed to. Many of the Olympic athletes we’ve recently watched on television trained for four years or more in preparation for the Olympic Games. They did not just go through the motions; they were deliberate and purposeful as they engaged in increasingly strenuous exercise. Furthermore, the intent of the strenuous exercise was to provoke their bodies into producing advantageous adaptations, which in turn facilitated improved performance.

In the sport of academia, it is not the body but the mind that must provoked in such a way as to induce advantageous adaptations. Therefore, you, as the academic athlete, must engage in mental activity that challenges your ability to search for and retrieve information, to think about and organize information in new or different ways, and to solve progressively more challenging problems. The key point here is that this type of learning is an active process. It requires your deliberate and purposeful effort, and for optimal learning, this process needs to
be repeated over and over again, similar to the type of training performed by the Olympic athletes.

So, what does this mean in practical terms? How can you, as the academic athlete, create a training program to enhance your academic performance?

First, as you read your textbooks, don’t just read the words on the page, think about the information being presented. How does one concept relate to the next? How does each bit of information help you better understand the author’s main point, or the process or concept being described? Additionally, many textbooks provide review questions within the chapters. Use these review questions. This active retrieval of information, even if you are initially unsuccessful in answering the questions, will likely result in advantageous neural adaptations and make it more likely that you will be able to retrieve the information in the future.

Second, while cramming the night before an exam, a study technique I am sure many of you are familiar with, does improve performance on the exam compared to not studying at all, it does not facilitate the types of adaptations necessary for your optimal long-term development as an academic athlete. The problem with cramming is that much of the information initially retained for the exam will be lost within a few days, which makes studying for subsequent exams more difficult. A far better strategy is to create a training plan, much like the Olympic athletes, to actively engage the material repeatedly prior to the exam and over the course of the semester. One technique is to summarize the author’s main points using as many of the key terms presented in the text as possible. Just pretend you are telling your roommate or a friend about what you read. If you get stuck in your explanation, no worries. Simply go back and review that section of the chapter and then continue on with your explanation. In terms of how frequently to engage in this type of mental training, try to review the material one or two days after you initially studied it, then a week a later, then a month later.

Principle #2: Variation. The principle of variation states: in order to optimize gains in strength and performance, the nature of the exercise stress must be varied over time. So, let’s consider the Olympic athletes again. If high level athletes were just to practice their sport or do the same exercises each time they train, they would likely see gains in their performance early on, but those gains would plateau over time. In other words, if the body experiences the same stress over and over, it becomes accustomed to the stress and is no longer compelled to adapt. To avoid this plateauing effect, the Olympic athletes purposefully vary the different qualities of the training sessions to keep the body off-balance and to provoke the body to adapt to the training stress.

So, what does the principle of variation have to do with learning? How can you, as the academic athlete, leverage the principle of variation to enhance your academic performance?

Simple, create variety in when, where, and how you study. Try studying at different times of the day and in different locations. In addition to studying at night in the library, study in the morning in your dorm room or in your favorite coffee shop. Study in the afternoon while listen
to your favorite music or while riding on the Link. Additionally, rather than studying two subjects for an hour each, break up your studying into small chunks each lasting about 15 minutes and switch back and forth between assignments. Even better, take a short 5 minute break between each of the 15 minute segments. By forcing the brain to switch back and forth between tasks and by studying at different times of the day and in different environments, the nature of the mental stress is varied. This variation in mental stress then enables the brain to make and strengthen neural connections in such a way that information is more easily retrieved later. In other words, the variation in when, where, and how you study enhances learning.

**Principle #3: Recovery.** The principle of recovery states: while the training session provides the stimulus for improvements in strength and performance, the actual adaptions occur during the time between training sessions and it is these adaptations that result in the long-term improvements in performance. In other words, recovery is just as important as the exercise stress improving athletic performance. That is the reason why Olympic athletes follow carefully planned training schedules that help to ensure both appropriate stress and sufficient recovery.

As an academic athlete, your brain also adapts best when the stress of learning, thinking, and problem solving is balanced with periods of recovery. That is why it is important to find opportunities to briefly step away from the rigorous academic work and engage in activities less taxing to the brain. This may involve playing a few chords on your guitar, or hanging out with friends, or going out for a walk in search of Pikachu or the elusive Snorlax or Mewtwo. It’s about balancing the mental stress of academic work with the recovery that allows for optimal adaptation to that mental stress.

Finally, much like its effect on athletic performance, sleep appears to be important in bolstering academic performance. While the exact role sleep plays in learning is far from understood, it appears that sleep helps to strengthen the neural connections associated with memories that are considered important and to weaken the neural connections associated with memories that are considered less important. This strengthening of some neural connections and weakening of others assists us in comprehending and retaining important information. An additional benefit of sleep is that it may allow us to see the big picture better and it enables us to see how ideas are connected in ways that were not obvious when we were awake. This integration and connection of ideas then allows us to awaken with new insights into complex processes or to develop potential solutions to complicated problems. In other words, quality sleep helps us to learn, even when we are not awake.

So, here we are, at the start of a new academic year and the start of your next major training cycle as an academic athlete. I ask that you spend some time thinking about how you are preparing to achieve your academic, career, and life goals. Are you optimally training your brain and putting yourself in a position to be successful by appropriately applying the principles of progressive overload, variation, and recovery?

Thank you.