On understanding fundamental principles:

Many students do not appreciate the distinction between mere knowing and understanding. They often equate successful learning with the ability to follow worked examples and answer standard questions found in typical textbooks; they become engrossed in the activity of problem-solving, without first engaging in the more time-consuming and sometimes frustrating process of thoroughly understanding the underlying theories. However, my tenet is that students should be able to think and solve problems from first principles: first principles are valid and useful for a lifetime, in contrast to rules of practical technology that can change every few years.

I therefore emphasize from the first lecture that if a student should ever feel overwhelmed with too much material to memorize, (s) he has probably not achieved sufficient understanding. Since the interrelationship between properties, structure and processing is central to the study of materials, this strong link is maintained throughout my lectures from topic to topic. I also guide students to think from first principles by posing questions such as “Why is it that the same steel may be made soft and ductile, or hard and brittle?” or “Silicon is normally considered an insulator. How then is it used to make computer chips?” Such problems challenge students to consider the properties of a material, how these are governed by the underlying structures, and also the processing required to effect changes in the structure and, in turn, the properties.

“She is able to draw real life examples and explain its relevance to the topic she’s teaching, thus teaching students how important it is for them to learn and understand what she’s teaching.”

“Her lectures are very detailed yet easy to understand. Her way of teaching also captivates me and it makes me very passionate about the subject. She is a friendly and professional professor.”