Failure is unavoidable in high volume manufactured engineering products, which includes advanced packages for numerous applications to address the competitive needs in the era of digitization and electrification. In order to minimize failure and to improve quality, robustness, durability, reliability, and safety of a product, investigation of failure is an important and yet complex and complicated activity that requires integration of diverse knowledge in science and engineering by inter-relating fundamental and technological knowledge of engineering materials, processes, and operation principles of the product. As more diverse, complex, and conflict engineering materials with complicated geometry and distinctive difference in dimension, interactions of engineering materials within an advanced package are getting complicated. Hence, a systematic, effective, and data-driven approach must be adopted in failure analysis. In this lecture, basic strategy and essential knowledge required to create postulation, verification, and confirmation of failures, subsequently to establish failure mechanisms, and finally to identify root causes of failures in advanced packaging will be elaborated. Fundamental understanding of critical property, performance, and characterization will be correlated to failures in advanced packaging. Potential challenges in failure analysis will be briefly presented at the end of the lecture.