The recent use of the real-time monitoring system (RTMS) based on the Internet of Things (IoT) is growing exponentially. It has some specific challenges according to its architectural design and functional domain. In this paper, we study the architectural design of various real-time monitoring systems that are designed to monitor the different real-world environments. After that, we have combined the common architectural concepts of those designs, and then we have proposed a standard architectural design for RTMS based on the IoT. Our architecture combines various technological tools and innovative practices. We also explain how to implement and extend our proposed architecture to monitor the specific field, and hence we believe that this architecture can be a standard architecture for real-time monitoring systems. Moreover, it can be extended to develop a system that helps to improve the traditional students’ learning paradigm to the modern virtual technological environment (VTE) model. The VTE facilitates students to enhance their knowledge from different perspectives. (Received September 15, 2019)