

METROLOGY EDUCATION

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Abstract

We are living in the ISO 9000-led paradigm wherein buyers and sellers give unprecedented importance to quality of products and services. Higher quality means tighter tolerances, which in turn implies that metrology-the science and art of measurements-plays a major role in the success of the new culture. Measurement accuracies that were only realized in standards laboratories a few years ago are now available on test benches. As a result, the demand for metrologists has reached new heights, however, the supply has been scarce. Time has now come that our universities introduce metrology in their engineering curricula so that young engineers fill the gap between supply and demand for metrologists. The universities should produce engineers who have a minimum necessary knowledge of metrology in addition to their major subjects. This paper proposes two senior-level multidisciplinary electives that should be introduced in the curricula of our universities. The first course, referred to as Metrology-I, concentrates on teaching generic methodology to set-up and design simple measurement systems and thus emphasizes measurement science aspect of metrology. The second course, Metrology-II, concentrates on teaching formal knowledge of basic techniques of measurements in areas such as electrical, mechanical, electronics, photonics, and thus covers measurement technology aspect. The paper furnishes course outlines for lecture as well as laboratory/tutorial sessions and suggested textbooks for a 15-week semester for both courses. The method of presentation should be three 50-minute lectures per week and an additional 3-4 hours per week for the laboratory or tutorial session constituting 4 semester credits for each course. Using this approach our universities would be able to cope with the increasing demand for engineers who can set up good, traceable measurements, gather reliable measurement data, and use it in the applications and advancement of newer technologies.