

# Precision & Nano Metrology

## Course Overview

---

The manufacturing of objects with ever smaller physical dimensions is one of today's major industrial challenges. The increased focus on quality assurance combined with needs for reducing production costs lead to a demand for techniques that characterize the geometry of such objects in a precise and unambiguous way. One of the necessary conditions for mutual recognition of such measurements is that they are traceable to the definition of the SI units.

## Benefits

---

This course will take you through a number of the most important techniques used for precision measurements of geometrical parameters in a combination of lectures you will get acquainted with these techniques and you will learn to assess your own needs and how to proceed in solving your problems.

## Course Content

---

### Set 1

- **Nanometrology: a must in the 21<sup>st</sup> century**  
Dr. Kim Carneiro, Danish Institute of Fundamental Metrology
- **Nanometrology**  
Dr. Jørgen Garnæs, Danish Institute of Fundamental Metrology

### Set 2

- **Introduction to Atomic Force Microscopy**  
Dr. Jørgen Garnæs, Danish Institute of Fundamental Metrology

### Set 3

- **Uncertainty fundamentals**  
Dr. Lars Nielsen, Danish Institute of Fundamental Metrology
- **Uncertainty in the nano regime**  
Dr. Anders Kühle, Danish Institute of Fundamental Metrology

### Set 4

- **Traceability in dimensional metrology**  
Dr. Jes Henningsen, Danish Institute of Fundamental Metrology
- **Optical interferometry**  
Dr. Jes Henningsen, Danish Institute of Fundamental Metrology
- **Traceability of precision measurements on coordinate measurement machines**  
Professor Leonardo De Chiffre, Technical University of Denmark

### Set 5

- **Scanning electron microscopy**  
Prof. Andy Horsewell, Technical University of Denmark
- **Scanning near-field optical microscopy**  
Dr. Sergey Bozhevolnyi, Aalborg University
- **A space application of nanometrology**  
Dr. Finn E. Christensen, Danish Space Research Institute
- **Surface texture analysis**  
Professor Leonardo De Chiffre, Technical University of Denmark

## **Experts**

---

The course brings together renowned experts from Denmark to deliver a unique blend of technical, management and market related know-how and experience