

# Metrology in surveying and mechanical engineering

*Editorial*

A new bachelor study programme has been started at the Faculty of the Civil Engineering CTU in Prague in 2014. Metrology as a scientific and technical discipline is an inseparable element of the infrastructure and the economy as a discipline and affects all technical disciplines. Given the importance and social benefits of metrology, the Ministry of Industry and Trade of the concept of the national metrological system (NMS) of the Czech Republic for the period from 2012 to 2016. The concept states that one of the essential conditions for further development of the economy is to increase competitiveness, among others. Increasing labour productivity and quality of products and services. Therefore, it is necessary development also in education, research, development and innovation.



Figure 1: Metrological testing of the TOPCON GPT 7501 instrument

This can be achieved by creating programs of basic and further education in metrology. Therefore, the management of the Faculty of Civil Engineering in Prague decided to submit



Figure 2: Calibration of the laser-tracker Leica AT401 with use of the laserinterferometer

an application for accreditation of a new four-year bachelor's degree program Metrology with study course Metrology in surveying and mechanical engineering in full-time study. Symbiosis of surveying and mechanical engineering is here given by natural blending of methods in the measurement of the shape and size of large components. These include measurements using basic gauges, micrometric taps, stirrup gauges, laser interferometry, coordinate machines, levelling devices, plumbing instruments, total stations, by photogrammetry or by 3D scanners. Accreditation was awarded from 3. 3. 2014 to 31. 3. 2020. Faculty of Civil Engineering and Faculty of Mechanical Engineering in Prague jointly execute teaching.

The study is focused on basic principles of metrology and quality management activities. The study is based on a theoretical foundation subjects (mathematics, physics measurement, processing and analysis of measurement), on professional subjects (metrology in surveying, engineering metrology, quality management, accuracy of geometrical parameters in construc-



Figure 3: Prism on the laser-interferometer line

tion), the articles of base area of application (Basics of construction, mechanical engineering basics, geodesy). Professional education is completed by the issue of standardization and rights. During the 5th to 7th semester there is an individual professional experience of 6 weeks.

This is a practically oriented bachelor program, student is not expected to proceed on a master's study program after completing the bachelor one. Graduate has basic knowledge and skills in surveying, surveying, construction and engineering construction and technology and related legislation, is equipped with special knowledge in the field of metrology and quality management.

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