

# Gage Calibration

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## Seminar 114: Hands-On Gage Calibration

## Seminar 110: Introduction to Precision Measuring Tools and Gages

Mitutoyo America's Gage Calibration course is a unique, active, educational experience designed specifically for those who plan and perform calibrations of dimensional measuring tools, gages, and instruments. This course is taught at the world-class, Mitutoyo America A2LA accredited calibration laboratory in Aurora, Illinois, by experienced instructors and dimensional metrology experts. The class size is intentionally small – a maximum of 6 students – to ensure personalized and customized instruction to meet the needs of individual students. The course combines modern calibration and quality management ideas with best practices and “how-to” calibration methods for common calibrations. The course is ideal for those operating in ISO/IEC 17025 accredited laboratories or in gage labs supporting manufacturing operations.

The course covers the most common dimensional calibrations but also allows for individual students to cover topics of interest. Upon enrollment, students will have the opportunity to complete a [questionnaire](#) to ensure the customized course meets their specific needs. The Hands-On Gage Calibration course will also address the essential elements, policies, and requirements of a modern gage calibration system. Woven into the hands-on experience, the course will cover calibration system standards, laboratory management, traceability, measurement uncertainty, temperature issues, and laboratory accreditation.

### Seminar 114: Hands-On Gage Calibration (3-days)

Utilizing multiple instructors with deep expertise in dimensional calibration methods and practice, this course is unlike any other calibration course. With hands-on exercises, the first day of this course covers key principles that apply to all calibration situations, such as selection of calibration methods, use of appropriate reference standards, reporting of results, and traceability. Students will perform actual calibrations, learn and practice techniques to improve accuracy of results, and understand how the general principles learned in class can be extended to the development of other calibration methods. Day two of the course moves into a series of demonstrations and hands-on practice of various calibrations, and by the end of day two, the students will have covered all of the most common dimensional calibrations, including micrometers, calipers, dial indicators, test indicators, digital indicators, height gages, and micrometer standards. Day three provides for opportunities to cover specific areas of interest, such as the calibration of gage blocks, ring and pin gages, specialty micrometers, bore gages, and other specific desires of the students. Depending on the class, commonly covered calibrations include optical comparators, coordinate measuring machines, angle gages, protractors, etc. The third day also provides an opportunity to spend time in the Mitutoyo America Calibration Laboratory, one of the highest-level commercial calibration labs in the United States. On the third day, the class is usually split into even smaller groups to allow for more customization of the training to meet specific desires of the students. Basic repair of micrometers, calipers, and indicators is covered as well as the opportunity for more advanced topics such as measurement uncertainty. Students can be expected to leave class ready to perform many of the common dimensional calibrations, with an understanding of more advanced calibrations, and with the necessary skills to develop additional procedures to meet their needs.

### Seminar 110: Introduction to Precision Measuring Tools and Gages (1<sup>st</sup> day – optional)

This optional 1-day course occurs the day prior to the 3-day Hands-On Gage Calibration course. For those newer to dimensional measuring equipment, this course prepares the student for the Gage Calibration course. This course borrows some material from our popular [Seminar 116 – Dimensional Metrology: Measurement, Inspection and Calibration](#) and introduces the student to commonly used precision dimensional measuring tools and gages such as micrometers, calipers, gage blocks, etc. This course covers equipment principles, measuring techniques, and best practices for the use of dimensional measuring equipment. The small class size allows the student to have significant hands-on opportunities.

**Prerequisites:** With the small size class, it is important that all students have the necessary background and training to ensure they receive the full benefit of the hands-on experience. Attendees should have general knowledge of calibration

systems and experience operating various types of dimensional measuring instruments, equivalent to the Mitutoyo educational [Seminar 116 – Dimensional Metrology: Measurement, Inspection and Calibration](#). The optional Seminar 110 (see above) is offered the day prior to the 3-day Gage Calibration course to satisfy this prerequisite for those who need some additional introduction to dimensional measuring tools and gages.

**Course Materials:** The course materials include extensive photographs and descriptions of calibration methods, as well as complete calibration procedures, worksheets, and example certificates.

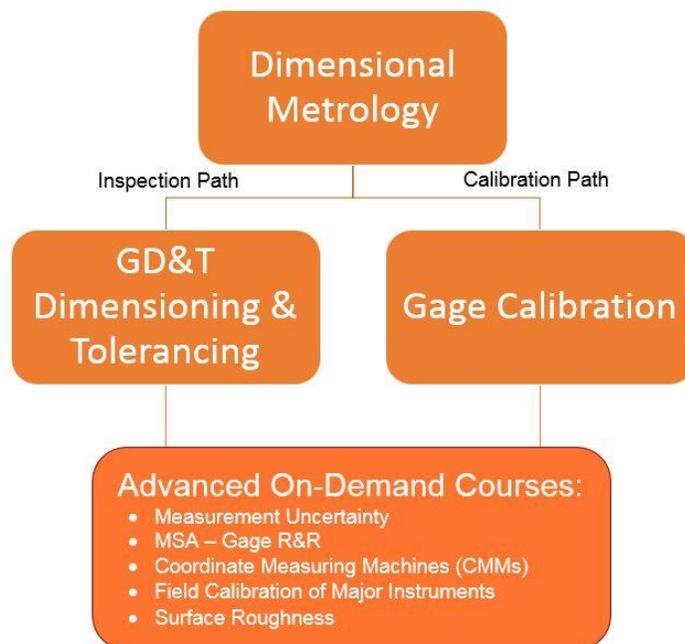
**Registration:** For questions or registration, please call the Education Department at 888-MITUTOYO (option 6) or direct at 630-723-3620. Office hours are 8:30 am to 5:00 pm Central Time. We can be reached via email at [mim@mitutoyo.com](mailto:mim@mitutoyo.com). Purchase orders can be faxed to 630-978-6471.

**Pricing:**

Course	No. of Days	Advanced Price	Standard Price
Seminar 110: Introduction to Precision Measuring Tools and Gages	1	\$ 530	\$ 585
Seminar 114: Hands-On Gage Calibration	3	\$ 1861	\$ 2044

- Advanced pricing applies when registration is completed more than 2 weeks prior to the class starting.
- A discount of 10% is available when registering more than two students for the same course.
- For cancellation information, please visit our website at [www.mitutoyo.com/education](http://www.mitutoyo.com/education).

**Comprehensive Curriculum:** The Mitutoyo Institute of Metrology offers a number of courses to meet the educational needs of manufacturing, quality, and measurement professionals. Our course are scheduled regularly throughout the year. The advanced courses are scheduled less frequently and are available on customer request in certain locations.



Mitutoyo and the Mitutoyo Institute of Metrology is a worldwide organization. We are proud to state that more than 200,000 engineers, technicians and managers have attended our measurement seminars over the years. If you wish to register or if you have additional questions, please contact us at 630-723-3620, 888-MITUTOYO, or email [mim@mitutoyo.com](mailto:mim@mitutoyo.com). Please visit our website for cancellation information at [www.mitutoyo.com/education](http://www.mitutoyo.com/education).