



## LABORATORY PLANNING GUIDE

# L21 Metrology & Measurement Laboratory

Content

Covered subjects according to the curriculum..... 2

Main concept..... 3

Initial training provided for laboratory personnel ..... 3

Requirements / Utilities ..... 3

Schedule of requirements ..... 4



Covered subjects according to the curriculum

Major topics of learning content:

- familiarisation with three-dimensional views as the basis of technical drawing
- step-by-step development of three-dimensional visualisation
- measurement exercises:
  - \* outer dimensions
  - \* inner dimensions
  - \* depths
  - \* angles
  - \* lengths
  - \* radii
  - \* parallelism
  - \* internal and external tapers
- exercises in production-oriented and standard dimensioning
- systematic familiarisation with a wide range of features on
  - \* cylindrical base forms
  - \* prismatic base forms
- familiarisation with
  - \* steel ruler
  - \* vernier caliper gauge
  - \* depth caliper gauge
  - \* external micrometer
  - \* depth micrometer
  - \* inside spring caliper as gauge
  - \* block gauge
  - \* taper ring gauge
- - \* three-plane views
  - \* plane views
  - \* surface finish and tolerance specifications
  - \* parts lists
  - \* material specifications
- planning and execution of simple assembly operations:
  - \* planning and describing work sequences
  - \* assessing results

### Main concept

The laboratory is designed for accommodation of 24 students + 2 laboratory staff:

- 2 - 4 students form a team and work together at a workstation / training system
- 24 experiment sets, in 12 different types
- Easy storage and transportation in a practical case
- Each set is equipped with a manual containing technical information, basic theory, experiment instructions, evaluation help and safety advice.
- Student teams are scheduled to change workstations from lab session to lab session in order to perform the entire range of experiments within the course duration.
- Average time per experiment: 90 to 120 minutes.

2 workstations for laboratory staff (with PC and internet access)

1 printer for common use

1 cupboard for the experiment cases

### Initial training provided for laboratory personnel

Trainer: Specialized engineer of G.U.N.T. Gerätebau GmbH, Germany.

To be conducted immediately after installation and commissioning of the equipment.

General topics to be covered for any of the educational systems:

- Basic familiarization with the system.
- Functions and components.
- Overall system configuration aspects.
- Start-up and operational aspects.
- Conduction experiments, including evaluation and calculation.
- Using the system with and without the software (where applicable).
- Trouble shooting and maintenance aspects.
- Hands-on, practical familiarization aspects.
- Seminar participants with the delivered system.
- Details of the manuals.
- Safe operation and preventive maintenance.

### Requirements / Utilities

Power supply:

- 230 V / 50 Hz / 1 phase – at least 2 power sockets for staff computers.

Laboratory computer network:

- 2 internet connections for staff

Location:

- Laboratory space min 60 m<sup>2</sup>
- This laboratory could be installed on any floor (e.g. ground floor or 1<sup>st</sup> floor)

Schedule of requirements

Item No.	Description	Quantity
Item 1	Engineering drawing: three-dimensional display	2 pcs.
Item 2	Assembly of bending device	2 pcs.
Item 3	Assembly of lever shears	2 pcs.
Item 4	Assembly of lever press	2 pcs.
Item 5	Dimensional metrology I: training kit 1	2 pcs.
Item 6	Dimensional metrology I: training kit 2	2 pcs.
Item 7	Dimensional metrology I: training kit 3	2 pcs.
Item 8	Dimensional metrology I: training kit 4	2 pcs.
Item 9	Dimensional metrology I: training kit 5	2 pcs.
Item 10	Dimensional metrology I: training kit 6	2 pcs.
Item 11	Dimensional metrology II: training kit 1	2 pcs.
Item 12	Dimensional metrology II: training kit 2	2 pcs.