

DELFT UNIVERSITY OF TECHNOLOGY

Department of Precision and Microsystem Engineering

Mekelweg 2, 2628 CD Delft, the Netherlands

**Graduate School PME Experimental Trainings** *(1.5 ECTS is equivalent to 5 GS credit points)*

|  |  |  |  |
| --- | --- | --- | --- |
| **Training** | **Responsible person** | **ECTS credits (preparation + contact hours)** | **GS credits (translation from ECTS)** |
| Scanning Electron Microscope | Instructor from company (Jeol) | 0.3 | 1 |
| Instrument: Jeol JSM-6010LA SEM  Principles of SEM  Sample preparation  Experimental Setup  Working with the microscope  Detectors  EDS  Setting up a measurement in SEM  Post-processing of data | | | |
| Scanning Electron Microscope | Johan van der Cingel (EKL) | 0.15 | 0.5 |
| Instrument: Philips XL50  Principles of SEM  Sample preparation / information about sample holders  Experimental Setup  Working with the microscope  Setting up a measurement in SEM  Different output formats of data | | | |
| Laser Doppler Vibrometry | Tjitte-Jelte Peters | 1.5 | 5 |
| Instrument: Polytec MSA-400  Principles of laser Doppler vibrometry  The MSA-400 components: controller, junction box, computer, microscope, laser interferometer  How to connect the components to each other and to the actuator  Calibration of the laser spots  Explanation of the PSV software for MSV mode of MSA-400  Setting up a measurement with actuation  Post-processing a measurement (frequency response analysis, vibration mode analysis)  **Was appointed the administrator for this instrument. Provided training to approximately 8 new users.** | | | |
| White Light Interferometry | Patrick van Holst | 0.6 | 2 |
| Instrument: Bruker Contour GT-K 3D  Principles of interferometry  Working with the WLI  Setting up a measurement with the WLI  Advanced options: stitching, automation, data output  Post-processing of data (Vision64 software and Gwyddion software)  **Assisted in the Intro Lab PME practical *Surface roughness measurement* as trainer** | | | |
| Wirebonding | Arjan Beukman (TNW) | 0.15 | 0.5 |
| Instrument: Westbond wedge-wedge wirebonder  Principle of wirebonding  Working with the Westbond wirebonder  Gaining experience with the Westbond wirebonder | | | |
| Style Surface Profilometry | Cassan Visser (EKL) | 0.15 | 0.5 |
| Instrument: Dektak-8 profiler  Working with the Dektak-8  Setting up a measurement with the Dektak-8  Result interpretation | | | |
| Spraycoater | Wim Wien (EKL) | 0.15 | 0.5 |
| Instrument: EVG 101 Spraycoater  Operating the Spraycoater  Changing the photoresist  Properly coating of photoresist | | | |
| CAD – Mask development | Jan Cornelis Wolf (EKL) | 1 | 3.5 |
| Principles of photolithography  Mask design (inversion, mirroring, alignment marks, etc.)  Development of sophisticated system for parameterized mask design (Excel -> Python -> GDSII)  Mask ordering  Development of two mask sets (5 masks each) | | | |
| Flowchart development | Hugo Schellevis + others (EKL) | 0.6 | 2 |
| Setting up the process steps  Creating figures for visual support  Acquiring and processing feedback from process engineers  Development of three flowcharts (P3315, WB1839, WB1993) | | | |