

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)*

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| **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 SEMPrinciples of SEMSample preparationExperimental SetupWorking with the microscopeDetectorsEDSSetting up a measurement in SEMPost-processing of data |
| Scanning Electron Microscope | Johan van der Cingel (EKL) | 0.15 | 0.5 |
| Instrument: Philips XL50Principles of SEMSample preparation / information about sample holdersExperimental SetupWorking with the microscopeSetting up a measurement in SEMDifferent output formats of data |
| Laser Doppler Vibrometry | Tjitte-Jelte Peters | 1.5 | 5 |
| Instrument: Polytec MSA-400Principles of laser Doppler vibrometryThe MSA-400 components: controller, junction box, computer, microscope, laser interferometerHow to connect the components to each other and to the actuatorCalibration of the laser spotsExplanation of the PSV software for MSV mode of MSA-400Setting up a measurement with actuationPost-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 3DPrinciples of interferometryWorking with the WLISetting up a measurement with the WLIAdvanced options: stitching, automation, data outputPost-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 wirebonderPrinciple of wirebondingWorking with the Westbond wirebonderGaining experience with the Westbond wirebonder |
| Style Surface Profilometry  | Cassan Visser (EKL) | 0.15 | 0.5 |
| Instrument: Dektak-8 profilerWorking with the Dektak-8Setting up a measurement with the Dektak-8Result interpretation |
| Spraycoater | Wim Wien (EKL) | 0.15 | 0.5 |
| Instrument: EVG 101 SpraycoaterOperating the SpraycoaterChanging the photoresistProperly coating of photoresist |
| CAD – Mask development | Jan Cornelis Wolf (EKL) | 1 | 3.5 |
| Principles of photolithographyMask design (inversion, mirroring, alignment marks, etc.)Development of sophisticated system for parameterized mask design (Excel -> Python -> GDSII)Mask orderingDevelopment of two mask sets (5 masks each) |
| Flowchart development | Hugo Schellevis + others (EKL) | 0.6 | 2 |
| Setting up the process stepsCreating figures for visual supportAcquiring and processing feedback from process engineersDevelopment of three flowcharts (P3315, WB1839, WB1993) |