

Micro Nano Technology (MNT) Health & Safety Workshop Agenda

All sessions conducted in the Physics and Nanotechnology Building

Day 1 (July 21, 2025): Identifying MNT Health & Safety Risks

Session overview	
A. Workshop schedule – Pete	5 min
B. Introduction of participants – Pete & Jim	15 min
C. How this information is useful in an MNT lab teaching setting – Jim	10 min
MNT particle properties and hazards	
A. General particle properties	
• Presentation: Scales, definitions, and particle metrics – Jim	20 min
• Activity: Number, surface area, and mass – Pete	30 min
<i>BREAK</i>	5 min
B. Aerosol properties and hazards	
• Presentation: MNT aerosol properties important to health & safety – Pete	20 min
• Activity: Dust generation – Pete	30 min
• Presentation: Health-related principles of MNT aerosols – Pete	20 min
<i>BREAK</i>	5 min
C. Colloid properties and hazards	
• Differences with airborne vs liquid borne nanoparticle dispersions – Jim	15 min
• Typical uses of colloids in undergrad labs, workplaces – Jim	15 min
• Colloid synthesis: Chemical hazards – Jim	15 min
• NP disposal: Hazardous chemical waste – Jim	15 min
LUNCH	60 min
Measurement of airborne and colloidal MNT particles	
A. What properties do we want to measure for MNT particles?	
• Presentation: How can we describe particles? – Jim	
□ Size	
□ Concentration	
□ Shape	
□ Charge	
□ Surface characteristics	
	30 min
B. Particle measurement methods	
• Presentation: Measuring airborne micro/nanoparticles – Pete	40 min
<i>BREAK</i>	5 min
• Activity: Instrument response as function of particle size – Pete	45 min
• Presentation: Measuring colloidal micro/nanoparticles – Jim	30 min
<i>BREAK</i>	5 min
• Lab Activity: Using standard colloid analysis tools	45 min

Day 2 (July 22, 2025): Preventing MNT Health & Safety Risks

Session overview A. Schedule – Pete B. How this information is useful in an MNT lab teaching setting – Jim	5 min 10 min
Preventing exposures to airborne MNT particles • Presentation: Engineering controls – Pete • Presentation: Administrative controls – Pete • Presentation: Personal protective equipment – Pete BREAK • Activity: Selection, donning, and fit testing of respirators – Pete Identifying hazards from safety data sheets • Presentation: How to read a safety data sheet (SDS) for chemical hazards, exposure routes, personal protection, etc. – Jim • Activity: Practice reading an SDS – Pete & Jim BREAK Preventing hazardous exposures in an MNT instructional setting • Presentation: PPE in an MNT instructional setting – Jim ☐ Chemicals ☐ Nanomaterials ☐ Biohazards ☐ Cryogenic liquids ☐ Centrifuge safety LUNCH	15 min 15 min 15 min 5 min 45 min 20 min 30 min 5 min 45 min 60 min
Handling materials in microfabrication training • Health and safety issues presented by microelectronics training – Jim ☐ Overview of cleanroom environments ☐ Overview of lithography/fabrication steps ☐ Chemical, physical hazards at each step BREAK • Presentation: Microfabrication Lab – Jim • Activity: Photopatterning of a wafer – Jim ☐ Review instructions ☐ Consider safety requirements ☐ Conduct the activity safely BREAK • Tour: Go into cleanroom, review unit operations, discuss hazards and safety training	45 min 5 min 40 min 45 min 5 min 60 min
Workshop wrap-up	10 min