NE UNDERGRADUATE TEACHING LAB IN DC
LAB TEACHING PLAN

Instructor/Manager: Neil McManus
Laboratory Location: DC 3701 (A, C, D, H), and DC3702, DC3705, DC3707, DC3709

1.0 ELIMINATION OF NON-CAMPUS RELATED WORK

Eliminating the hazard is the best means of ensuring that risk is minimized. To this end, differentiate work that should be performed remotely versus what work must occur on campus. List the work here and discuss these expectations with your group.

<table>
<thead>
<tr>
<th>Remote work</th>
<th>Campus work</th>
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</thead>
<tbody>
<tr>
<td>All work that does not require us to physically be in the lab</td>
<td>On-campus lab sessions, lab set-up, lab maintenance (i.e., waste, solvent re-filling, equipment maintenance, etc.)</td>
</tr>
<tr>
<td>Online experiments</td>
<td>Hands-on required experiments</td>
</tr>
<tr>
<td>Pre-lab preparation, post lab data analysis, and lab report writing will be done remotely</td>
<td></td>
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</tbody>
</table>

*To be clear, all work that can occur remotely should be conducted remotely.

2.0 WORKER TRAINING

Prior to coming back to campus, employees (including TAs) and students must complete the following training:

- Complete the mandatory “Return to Campus Safety during COVID-19” (SO 2036) online training
- Complete orientation of new practices outlined in this procedure by the NE Lab Manager, Teaching
- Collect completion record of SO 2036 by each TA
3.0 RESPONSIBILITIES

3.1 SUPERVISOR
Supervisors shall:

- Meet with lab instructors and teaching assistants prior to allowing them access to the lab. Orientation shall cover all items within this plan.
- Develop this plan to meet Workplace Health & Safety Guidelines for COVID-19.
- Enforce all criteria within this plan
- Ensure appropriate hand hygiene and surface disinfection supplies are provided for workers.
- Physically visit and inspect the laboratory on a monthly basis:
  - to identify hazards as per the Occupational Health and Safety Act; and,
  - to ensure the adequacy and adherence to this work plan.

3.2 WORKERS AND STUDENTS
Workers shall:

- Follow all guidance within this plan
- Work from home for all tasks that do not need laboratory access
- Notify the supervisor if supplies are not sufficient to maintain hand hygiene and surface decontamination requirements
- Notify the supervisor of any hazards that are discovered while working
- Not to come to work if ill, and follow UW illness reporting guidelines.

4.0 HEALTH PROTOCOLS

4.1 SELF-ASSESSMENT SCREENING
To minimize risk, workers and students must not come to campus when ill. For this reason, the University requires that employees and students monitor themselves daily for symptoms of influenza-like-illness. The COVID-19 self-assessment tool, found on the University’s Health & Travel Guidance site, provides clear directions on how to self-assess. Employees and students will also be reminded to conduct self-assessment at building entrances. No personal data will be collected and individuals will be reminded to complete the self-assessment.

4.2 ILLNESS AND ABSENCE REPORTING
All employees must be aware of the symptoms and the importance of reporting symptoms and/or absences to their supervisors or delegates before the beginning of the first day absent.
Due to COVID-19, all absences should be reported to the manager. Confidentiality of personal information will be maintained at all times and subsequent actions will include:

- If the employee is ill, the manager is to report this directly to Occupational Health and proceed with usual illness reporting procedures through Workday
- If the number of sick days exceeds 5 consecutive workdays, the manager will track sick time in Workday (for Staff) and work with the Disability Management team
- During the return to campus phase, Occupational Health will continue to monitor all absences

When reporting the absence please include:

- The name of the absent employee
- The department (include work area or location)
- The employee’s home and/or mobile phone number

Occupational Health will communicate with the individual, as well as the departmental or administrative head, to provide guidance about maintaining good health practices in the workplace.

Normal sick leave procedures captured within the University of Waterloo Disability Management Guide will be followed. Medical documentation will be required after the fifth workday absent.

If you have questions, please consult with Occupational Health for further direction.

5.0 ADJUST THE WORKPLACE - PHYSICAL DISTANCING

Physical distancing is the next best way to reduce risk. Physical distancing of 2 m will be maintained, adhering to occupancy limits and traffic-flow throughout the laboratory and establishing a work schedule.

5.1 OCCUPANCY LIMITS AND TRAFFIC FLOW

There are 6 different lab rooms in the DC undergraduate cleanroom and metrology suite that will be used during the different terms. The overall legend is as follows:
• **DC 3701 (gowning room): OL=1**
  - Max occupancy based on square footage: 1
  - Max occupancy based on usage: 1
  - The gowning room will only hold 1 person at any given time. The students will be given instructions through online Learn training prior to the in-lab period. An Instructor/TA will be able to view the student through the glass.

• **DC 3701 (A, C, D): Total OL=5**
  - Max occupancy based on usage: 4 students, 1 instructor/TA
  - Students and/or instructor will move between DC 3701A, 3701C and 3701D as the lab progresses and students use various instruments.

Students will be grouped with 4 students per day entering individually one hour apart. There will be one or two instructors/TA depending upon the number of students present as allowed by the occupancy level. As students move back and forth from A/C/D, a total of OL5 for the entire suite ensures that the occupancy of each room, listed below, is not exceeded.

• **DC 3701A: area 53.5 m² (OL=4)**
  - Max occupancy based on usage: 4
  - Student will be located at either fumehoods or an instrument.

• **DC 3701B: area 80.8 m² (OL =2)**
  - Only instructors/staff will use this space to open the cylinders, vacuum pump, DI water and for instrument maintenance.

• **DC 3701C: area 25.3 m² (OL=2)**
  - Max occupancy based on usage: 2
  - Only 1 instrument in this room will be used at the same time so only the student that is scheduled for a given time and 1 instructor will be present.
• **DC 3701D: area 42.6 m² (OL=3)**
  - Max occupancy based on square footage: 3
  - Max occupancy based on usage: 1 student, 1 instructor and 1 TA
  - Only 1 instrument in this room (DEKTAK) or the computer will be used at the same time so only the student that is scheduled for a given time and 1 instructor will be present.

• **DC 3701 H: area: 34 m²; OL=2**
  - Max occupancy based on square footage: 2
  - Max occupancy based on usage: 1 student, 1 instructor/TA
  - Multiple instruments. Only one instrument: Woolam Ellipsometer, SUSS PM5 probing station or the optical microscope will be used at any given time so only the student that is scheduled for a given time and 1 instructor/TA will be present.

• **DC 3702 (3D printer room): area 36.8 m²; OL=3**
  - Max occupancy based on square footage: 3
  - Max occupancy based on usage: 2 students, 1 instructor/TA
  - All instruments will be placed at least 2m apart.

• **DC 3705 (SEM and Gold Sputter Apparatus): area 24.4 m²; OL=2**
  - Max occupancy based on square footage: 2
  - Only 1 instrument may be used at a time.
  - Max occupancy based on usage: 1 student, 1 instructor/TA
  - Regardless of the instrument being used in this room, only the student that is scheduled for a given time and 1 instructor will be present.

• **DC 3707 (XRD room): area 24.2 m²; OL=2**
  - Max occupancy based on square footage: 2
  - Max occupancy based on usage: 1 student, 1 instructor/TA
• Only 1 instrument is held in this room so only the student that is scheduled for a given time and 1 instructor will be present

• DC 3709 (Raman room): area 23.9 m²; OL=2
  o Max occupancy based on square footage: 2
  o Max occupancy based on usage: 1 student, 1 instructor/TA
  o Only 1 instrument is held in this room so only the student that is scheduled for a given time and 1 instructor will be present

• The instructor and/or TA will have to move around to supervise, maintain safety and assist students as needed, maintaining distance as much as possible. However, to ensure adequate supervision, safety and assistance, there will be short periods of time that a 2-meter distance will not be maintained; as such medical grade face masks will be required while in these spaces. The time when distance is below 2m will be kept to a minimum (less than 2 mins). Where possible the student will be asked to step away from the experiment before the instructor decides to approach the student.

### 5.2 WORK SCHEDULES

• Only the Lab Instructor (and/or TAs) and students that are assigned to be present that day are permitted in the lab based on the created lab schedule.
• Laboratory schedules for all labs in DC cleanroom and metrology suite will be posted on LEARN.
  o Only students and teaching assistants assigned to those scheduled labs/sections/days/times will be allowed to enter the laboratory
• Any student questions will be addressed remotely either by email or video chat (via MS Teams). In-person visits will only be accommodated when necessary and by appointment.

WORK ALONE PROTOCOL:
When an instructor is working alone (not within visual or voice range of another person) they will contact another instructor or colleague approximately every 90 mins to ensure all is well. Otherwise the WATSAFE app will be used and will contact the laboratory manager if the instructor does not respond. Any person being the contact of an instructor is to know to contact the laboratory manager who will personally verify the status of the worker if there is no contact with that individual.

5.3 OTHER CONSIDERATIONS FOR PHYSICAL DISTANCING
• Post occupancy limits on all lab entrances/exits
• Post hand hygiene procedures on all sinks and hand hygiene stations
• Remove extraneous seating
• Designate single use workstations with floor markings or tape (if needed)
• Ensure hand hygiene stations are present for workers to use.
• Communicate all changes being made due to COVID-19 to all occupants/workers
• Personal or street items shall not be stored within the lab. This means coats, bags, and other belongings will be placed on the shelves that are found in the DC 3838 hallway.

6.0 SURFACE DECONTAMINATION
Surface decontamination within the laboratory is the responsibility of Laboratory Instructor. As a minimum, most surfaces will be disinfected twice per day.

6.1 WORK SURFACE AND EQUIPMENT DECONTAMINATION
Work areas and equipment decontamination will be done jointly between the laboratory instructor, teaching assistants and students.

  • Upon arrival to the laboratory, students will be asked to use hand sanitizer that will be set up in the hallway in front of DC 3701. Nitrile gloves will be provided for student use.
• Students are required to wipe down all shared equipment with disinfectant before and after use.
• The laboratory instructors and teaching assistants will also disinfect surfaces, equipment, and high contact areas.
• Disinfectants will be provided at the workstation
### Table 1: Shared equipment disinfection details.

<table>
<thead>
<tr>
<th>Equipment Identifier</th>
<th>Disinfectant</th>
<th>Concentration</th>
<th>Contact time</th>
<th>Frequency of disinfection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>TRION PECVD - touch screen</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>Nitrogen guns</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>Syringe for depositing photoresist</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>Hot plates</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>MJB4 levers and knobs</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>Wafer carriers</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>Water guns</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>Microscope – focus knobs</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>TRION RIE – touch screen</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>DEKTAK – buttons and knobs, computer keyboard and mouse</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>SUSS PM5 prober, knobs, vacuum switch</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>Ellipsometer (3701H)</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>Boonton 7200 capacitance meter: knobs and buttons</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>Agilent DC Power supply knobs and buttons</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>Optical microscope: knobs, computer keyboard and mouse</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>Gold sputterer</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
<tr>
<td>SEM – switches, knobs and the tracking ball, sample chamber door, back scattering detector</td>
<td>Ethanol</td>
<td>70%</td>
<td>2 min</td>
<td>After use</td>
</tr>
</tbody>
</table>
Computer, connected with SEM, keyboard and mouse

<table>
<thead>
<tr>
<th>Item Identifier</th>
<th>Disinfectant</th>
<th>Responsible Person</th>
<th>Schedule</th>
<th>Frequency of disinfection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doorknobs, push bars, handles</td>
<td>Surface disinfectant</td>
<td>Instructor/TA</td>
<td>At start and end of lab period</td>
<td>Minimum twice daily</td>
</tr>
<tr>
<td>Cupboard knobs and handles</td>
<td>Surface disinfectant</td>
<td>Instructor/TA</td>
<td>At start and end of lab period</td>
<td>Minimum twice daily</td>
</tr>
<tr>
<td>Faucets and tap handles</td>
<td>Surface disinfectant</td>
<td>Instructor/TA</td>
<td>At start and end of lab period</td>
<td>Minimum twice daily</td>
</tr>
<tr>
<td>Lab phone</td>
<td>Surface disinfectant</td>
<td>Instructor/TA</td>
<td>At start and end of lab period</td>
<td>Minimum twice daily</td>
</tr>
<tr>
<td>Light switches</td>
<td>Surface disinfectant</td>
<td>Instructor/TA</td>
<td>At start and end of lab period</td>
<td>Minimum twice daily</td>
</tr>
<tr>
<td>Keyboards and mice</td>
<td>Ethanol</td>
<td>Instructor/TA</td>
<td>At start and end of lab period</td>
<td>Minimum twice daily</td>
</tr>
</tbody>
</table>

### 6.2 HIGH TOUCH AREA DECONTAMINATION

All high-touch surfaces will be disinfected twice daily when room is used. Designate responsible persons and a schedule for this to be done. Complete the table below for your research areas:

*Table 2: High touch surface disinfection summary table.*
Review the link for more information on the disinfection of surfaces:

7.0 HAND HYGIENE
Hand hygiene should be performed regularly throughout the day. At minimum, workers shall wash hands or perform hand sanitization when:

- In the DC 3838 hallway
- Hand washing is the preferred method of hand hygiene at UW.

8.0 GENERAL PROTECTIVE EQUIPMENT
If physical distancing is practiced, additional PPE will not be required. Should physical distancing not be possible for specific tasks or specific situations, cloth face coverings can be used.

Details on other general protective equipment are below:

- Where there is no human contact, gloves are not required to protect against COVID-19 (i.e., study participant). Gloves shall not be used in hallways (this rule has not changed). Hand hygiene is more effective.
- Respirators and surgical face masks are not recommended for general use to protect the public from one another. In cases where physical distancing of 2 m is not possible face coverings (cloth masks) can be used
- Lab coats should be designated to an individual. Washing is only required when they have been soiled.

All students will maintain distancing, when this is not possible, or when it is felt that students may need the help of instructors where this could lead to the breaking of distancing rules, masks/face coverings will be worn by both instructors and students.

9.0 WASTE DISPOSAL
1. Non-hazardous waste will be removed from labs by custodial services as per the schedule used prior to COVID-19.
2. Hazardous waste should be handled and removed according to the hazardous waste guidelines. Note – due to COVID-19 and physical restrictions in the
Environmental Safety Facility (ESF), open hours no longer exist. Waste must now be scheduled using the online calendar. Shutdown plan

All labs are required to have a shutdown plan. This means assigning responsibility to various individuals within your group to ensure the tasks in the Laboratory Ramp-Down & Temporary Shutdown Checklist can be accomplished on short notice.

**10.0 ACKNOWLEDGEMENTS**

*Worker acknowledgements:*

By printing and signing my name in the table below, I acknowledge that I have been trained on the procedures outlined in this document.

<table>
<thead>
<tr>
<th>Worker Name</th>
<th>Signature</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
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</table>

*Lab Instructor/Lab Manager, Acknowledgement:*

Lab Manager Name: ______Neil McManus

Lab Manager Signature: ______ Neil McManus ______

Date: 20/1/21
Approved by:

Laura Deakin
Science Safety Management Group

Jan 20, 2021