BTEC Safety Training

October 2022
Introduction

• This training is a requirement for any person who works in BTEC’s Biosensors & Instrumentation suite (BTEC 201 “dry lab”)

• The objective of this training is to provide users with the tools and knowledge to work safely

• Though this training provides a general overview of safety, it is important that anyone working in BTEC must be aware of hazards specific to any equipment and materials they use

• Must pass safety quiz at the end
Culture of Safety

- Safety is everyone’s responsibility
- Never work in the lab alone
- The BTEC Manager/Assistants are here to support your ideas and projects, and to provide you with the tools and guidance to work safely in BTEC
GENERAL SAFETY
General Safety Rules

• BTEC Manager/Assistants must be present for you to work in BTEC

• NO eating/drinking allowed
  – You can step out in the hallway to take a drink of water
  – Do not bring in any containers with food/drink unless they are fully sealed

• Must wear closed-toe shoes

• Do not put/leave items on the floor (e.g., backpacks), as this can pose a tripping hazard
  – Use cubbies for personal items
Use of Equipment

• Do not operate a piece of equipment you are not trained on/unfamiliar with/using for the first time

• Ask the BTEC Manager/Assistants for help

• We will provide equipment training for individuals/groups

• Make sure you are comfortable with any equipment you are using
Equipment on Benches

1. **Workstation**: data analysis (e.g., MATLAB), CAD (e.g., SolidWorks)
2. **Oscilloscope**: analyze analog signals (e.g., electrocardiogram signal)
3. **Analog-To-Digital Converter (ADC)**: digitize analog signals for manipulation on the computer
4. **Voltage Supply**: power supply for circuits (-20 to 20 V)
5. **Function Generator**: generate non-DC signals (e.g., sine wave)
6. **Filter/Gain Stage**: analog filter and amplifier (e.g., electrode readings from the body)
7. **Soldering Station** (against the opposite wall)
Electrical Safety

• Disconnect power sources when not in use

• Remove jewelry/metal on and around hands (can conduct electricity/current)
Soldering

- **Must** wear *eyeglasses* with side protection

- **Must** solder in proximity of snorkel
Personal Protective Equipment (PPE): What is Available and When to Use

1. Safety glasses
   - Mandatory for certain activities, such as soldering

2. Disposable gloves
   - Handling of solids (e.g., powders) / liquids that can stick to skin/clothes

3. Face shields
   - Good to use when trimming excess wires on finished circuit board

4. Masks
   - Additional protection against aerosols (e.g., solder smoke, COVID-19, etc.)
Additional Safety Equipment: What is Available and When to Use

1. Sharps container for disposal of blades and pointed instruments

2. Snorkels (local exhaust ventilation device)

3. Benchtop fans if require additional local ventilation
Cleaning Up Properly After Use

• Put away all tools and supplies

• Dispose of and/or properly store your work

• Clean up work area, tuck in chairs

• Wash hands
Waste Disposal

- Biological/Chemical
  - Satellite Accumulation Area
  - Biohazard box

- Battery & Other Electronics Recycling

- Sharps
Fire Safety Response: RACE

R - Rescue
Rescue the injured or anyone in the immediate danger so long as you do not put yourself at greater risk

A - Alert
Alert everyone in the area and activate the fire alarm pull station, alert other staff, and call 911 (*)

C - Contain
Contain the fire and smoke by closing the fume hood sash, cabinet, lab door, etc.

E - Evacuate
Evacuate the area and proceed to designated assembly location

*After Calling 911 Please contact Control to report fire:
@ BUMC 617-358-4444
@ CRC 617-353-2121
Fire Safety: Fire Extinguishers

- Must be inspected monthly and certified annually
- Only use a fire extinguisher if:
  - You have to fight the fire to save your own life
  - It is a small fire that is safe to extinguish, and you have been properly trained
- Using a Fire Extinguisher
  - PASS
    - Pull retaining pin
    - Aim the nozzle at the base of the flame
    - Squeeze the handle to discharge contents of extinguisher
    - Sweep from side to side
For Injuries/Emergencies

• First aid kit for minor cuts/injuries
  – On shelf near soldering area

• Eyewash station
  – One by sink near soldering area

• Emergency shower
  – In 207

• Fire extinguisher
  – West wall (on the right when facing whiteboards)

• Exit push buttons
  – Next to every door in case lose power

• Posted exit signage for egress routes in the event of an emergency or an alarm sounding
  – Above doors, in hallways
Eyewash Station

• Remove contamination from face/eyes

• If need use: hold eyelids open, roll your eyes around, rinse for **minimum 15 minutes**

• Is splash something on your face while wearing safety glasses/goggles, leave eye protection on while rinse face to prevent secondary contamination from spreading into your eyes

• Immediately notify BTEC Manager/Assistants
Emergency Shower

- Use to extinguish fire on your body or remove gross contamination

- Caught self on fire and near safety shower, stand under shower head and pull handle to activate water flow

- Spilled something on your body: remove contaminated clothing, then activate safety shower to remove contamination from your skin

- Immediately notify BTEC Manager/Assistants
Spills

- Restrict access to area, assess extent of spill, remove affected personnel
  - Notify BTEC Manager/Assistants immediately

- If been exposed, notify BTEC Manager/Assistants immediately and/or call 911
  - Will notify BU’s Research Occupational Health Program (ROHP) for medical assistance and/or call 911

- If you feel comfortable, have been properly trained, and there is no threat of adverse exposure, you can don appropriate PPE (e.g., gloves) and proceed to clean up a spill
  - If safe to do so, contain spill using paper towels

- Do not attempt to clean up a large spill or a spill beyond your control, or a spill with potential to create adverse exposures
  - BTEC Manager and/or Environmental Health & Safety will determine how to dispose of waste
Emergency Instructions Placard
(Located in BTEC 202)
Emergency Telephone Numbers

• When in doubt, call **911**
• Charles River Campus (CRC)
  – BU Police Department: **617-353-2121**
    • Fires, medical emergencies, security issues
  – BU CRC Control Center: **617-353-2105**
    • Building or facilities-related issues
    • Environmental Health & Safety (EHS) Emergencies (e.g., spills, etc.)
  – Research Occupational Health Program (ROHP): **617-358-7647**
    • Medical assistance related to laboratory work
    • Report ALL lab injuries or illnesses
Protocol for Reporting Incidents

- Notify BTEC Manager/Assistants immediately
  - BTEC Assistants will message you to indicate that your concern has been noted

- When in doubt please let us know about an incident, no matter how small

- Having record of incidents will help us prevent similar incidents from happening in the future
SAFETY IS EVERYONE’S RESPONSIBILITY
Consequences of Disregarding Safety Rules

• You may be asked to leave BTEC for remainder of that day

• Continued disregard of safety rules may result in being barred from BTEC altogether

• Following the safety rules is intended to ensure that you are working and learning in a protected and safe environment
Other Trainings

- Additional online safety trainings must be completed to use BTEC’s Molecular, Cellular, & Tissue Engineering Suite (BTEC 207 “wet lab”)

- Links for trainings are on the BTEC website

https://www.bu.edu/eng/departments/bme/btec/hours-and-rules-of-use/
Now You are Ready to Take the Safety Quiz!

• Stop by BTEC to review the slides with a BTEC Assistant and take the safety quiz

• The entire process will take 25 minutes or less

• To pass the quiz, you **MUST get 100%** or keep retaking the quiz until you get 100% and then show BTEC Assistant

• The quiz is good for one year