GENERAL LAB SKILLS - MICRO-CREDENTIAL

The CU MCDB Skills Center (MCDB 1234) provides for-credit learning opportunities for students to gain certification in individual laboratory science research skills. Micro-credentials are comprised of categorical groupings of these skills, providing the opportunities for certification in specific scientific competencies.

Eligibility

- CU Boulder students (including nondegree/ACCESS)
- CU Boulder students (degree seeking only)

Delivery Mode

Hybrid of in-person and online delivery.

Credit Status

Includes for-credit and noncredit components

Academic Level

Undergraduate and graduate

Time to Completion

Weeks

Fee

No

Requirements

Students must gain certification in each of the general lab basics skills (skills center safety, pipette operation and calibration, and buffers and stock solutions).

Criteria

Criteria for each skill are defined in each skill module's "Module Mastery Task" (MMT). Each is defined below.

Skills Center Safety

This task will test learners' knowledge of laboratory safety and safety specific to the skills center. Learners will need to complete the two safety trainings in section 6 and hand in their certificates as well as completing the skills center items below using the skills center map to mark locations.

- Where are the two nearest outside exits from the building?
- Where is the nearest fire extinguisher?
- Where is the nearest fire alarm pull station?
- Where is the first aid kit located?
- Where is the nearest eye wash located and describe how it functions?
- If a hazardous substance gets in your eyes, how long should you flush them before seeking appropriate medical attention?
- Where should plastic pipette tips and large pieces of broken glass be disposed?

Pipette Operation and Calibration

This task will test learners' ability to make several standard solutions using a laboratory pipette.

1. Pick a P1000, P200 and P20 to calibrate.
2. Calibrate the pipettes according to the calibration procedures.
3. Create a curve on excel for each one of the pipettes, using each of the 10 trials as your data points.
4. Calculate the accuracy for each of the three pipettes.
5. Send your graphs and calculations to one of the proctors to check your results.

Buffers and Stock Solutions

This task will test learners' ability to make several standard laboratory buffers with the correct pH.

Create a table showing the quantities (volume/weight) of every component of the following buffers:

- Buffer 1: 50 mL of 0.2M Na_2HPO_4, 100mM NaCl, pH 7.9
- Buffer 2: 25 mL of 0.1M TRIS, 50 mM NaCl, pH 8.1
- Buffer 3: 75 mL of 0.1M HEPES, 80mM NaCl, 1% glycerol, pH 7.4
- Buffer 4: 100 ml of 1M Sodium Phosphate buffer, pH 7.0 made from stock $NaPO_4$ and Na_2PO_4 solutions.

Make each of the buffers listed, label them with your name, date and the buffer components. Provide a copy of your table listing the components and amounts and arrange for a proctor to test your buffers.

Skills

- Buffers and stock solutions
- Pipette 0peration and calibration
- Skills center safety