APPENDIX 01 – STANDARD OPERATION PROCEDURES
FOR EQUIPMENT OF TEACHING LABORATORY

No.	Item	Standard operation procedures	PIC
1	Emergency shower and eyewash station	- Only use in emergency situations such as chemical exposure via skin, eyes, clothes, or during the scheduled inspection and maintenance. - For the emergency shower: pull the full range of motion of the shower handle. Users can hold the handle until the shower is over or release the handle to let the shower run through its full cycle. - For the eyewash station: push the full range of motion of the eyewash station handle and hold until finish using. - Contact the housekeep service to require supports for cleaning, making sure there is no water left on the floor after use.	CHS Lab
2	Chemical fume hood	- Turn on the main exhaust fan system of the entire lab (at the door of Locker room - G304). - Turn on the one-way air valve for each fume hood. - Press the “I” button on the control panel of the fume hood and wait 10 seconds for the fume hood suction sensor to work. The fume hood must achieve a suction capacity of at least 0.3m3/s at the highest safe position of the glass door. - Press the "Enter" button to temporarily mute the low suction power alarm if the user actively raises the glass door higher than the maximum safety threshold. - Press the "I" button again to turn off the fume hood's suction sensor after use, the proceed to turn off the one-way air valve and the main exhaust fan system. Only turn off the main exhaust fan system if there is no one using the lab after. - The sash should be kept at recommended level during operation.	CHS Lab
3	Autoclave (Brand: Benchmark – Model: B4000-16-E)	- Turn the device on/off using the junction box on the back of the machine and the switch button on the front, below the control panel. - Distilled water tank is located at the top of the device. After the tank is full, the device will beep, telling the user to stop adding water. In any case, if the signal to refill water flashes, the user must add distilled water in time. - Arrange different samples/materials in different trays, or at least 5cm apart. Avoid direct contact of different materials. - After placing the sample/material inside the chamber, close the door tightly and turn the doorknob lock clockwise. Choose between two sterilization modes at 121°C or 134°C. Make sure to open the water inlet valve at the front, under the door. - Press the “START” button to start the sterilization cycle. After the sterilization cycle is over and the pressure equalizes, the door can be opened, and the contents removed. To avoid burns, wear appropriate gloves or ensure the items are cool to touch prior to remove. Wipe the door seal with a clean cloth soaked in distilled water after use.	CHS Lab
4	Furnace (Brand: Daihan – Model: FHX-12)	- Turn on/off the appliance before and after use by using the equipment’s junction box and on/off switch. - During operation, users must wear heat-insulated gloves, use cup tongs and crucibles designed for use in furnace. - After turning on the device, set the operating time of the machine (blue timer LED is on). Choose to set the time 00:00 if users want the device to run continuously. - Press “MAIN” button to set heating temperature after setting operating time (red heat LED is on). Use the knob to set the temperature from 300 ^{O}C to 1200 ^{O}C. - After setting the opearating time and temperature, press the “PUSH” button to start the furnace. - In case of emergency, flip the furnace’s switch to stop the equipment.	CHS Lab
5	Drying oven (Brand: Memmert – Model: UN110)	- Turn on/off the device with the “ON/OFF” button. The user must wear insulating gloves to remove the hot items from the drying oven.	CHS Lab

		- To set the temperature, touch the "TEMP" button. Then use the knob to adjust the desired temperature setting. Press the knob to confirm. - With the similar operation, it is possible to set the time (TIMER), flap position (FLAP), fan speed (FAN) to suit the needs. - **Do not** use the same drying oven to dry chemicals and tools. - In case of emergency, press the "ON/OFF" button to stop the device.	
6	Vacuum drying oven (Brand: Memmert – Model: VO-29)	- Turn on/off the device with the "ON/OFF" button. - To open the vacuum drying oven's door, turn the door knob clockwise. The user is required to release the pressure valve to balance the pressure inside and outside the oven before opening the door after drying according to the instructions below. - To set the temperature (TEMP) and time (TIMER), follow the same operating instructions as for the conventional drying oven. - To set the pressure (VACUUM), touch the "VACUUM" button and follow the same operating procedures as when adjusting the temperature. If the pressure value is set higher than 1100mb, the display will show the word "open" indicating that the door will be opened after confirming the set pressure level. If the pressure value is set lower than 5mb, the display will show "low" indicating the low pressure setting level; then the pump will operate at full capacity and no longer control the pressure, so the actual pressure will depend on the pump capacity. - The user ensures that the sample is tightly closed and has an opening gap/hole, carefully checking if the chemical is likely to change in the environment of the oven. - In case of emergency, press the "ON/OFF" button to stop the device.	CHS Lab
7	Technical scale (Brand: Sartorius – Model: Entris 822-1S)	- Before using the technical balance, make sure that the scale is in the level position to ensure accurate measurement. If not, adjust the two swivel feet at the bottom, in front of the scale to adjust the scale to a level position. - Turn on/off the balance with the "I/O" button. - Place the sample container on the weighing pan and press the "TARE" button to return the scale reading to "0.00 g". - Put the sample on the sample container for weighing. Note, the scale can only measure up to 820g. - Wear appropriate PPE and weigh hazardous materials in a fume hood. - After use, make sure that the scale is kept clean. Clean with tissue or soft brush if necessary.	CHS Lab
8	Analytical scale (Brand: Sartorius – Model: Secura 224- 1S)	- Turn on/off the analytical balance with the "I/O" button. - Before the instrument can be used, the user must follow the instructions displayed on the scale screen by adjusting the two swivel stands at the bottom, in front of the scale to balance the scale. - Open the glass door, place the sample container on the scale and press the "TARE" button to return the reading on the scale to "0.0000 g". - Put the sample on the sample container and close all the glass doors for weighing. Note, the scale can only measure up to 220g. - Wear appropriate PPE and weigh hazardous materials in a fume hood. - Make sure that the scale is kept clean. Clean with tissue or soft brush if necessary.	CHS Lab
9	pH meter (Brand: Mettler – Model: S210)	- Turn on the pH meter by pressing the "On/Off" button. To turn off the machine, hold the button for two seconds. - The probe is always immersed and protected with the protective solution available with the probe. To use, remove the protective cap of the probe, press the "Read" button and submerge the probe into the liquid sample for accurate measurement results. The measurement results will be statically displayed on the screen after the correct results are available. - After each use, rinse the probe with distilled water and close it with the protective cap. Turn off the device after the measurement is complete.	CHS Lab
10	Centrifuge (Brand: Hermle – Model: Z206 A)	- General requirements when using centrifuges: it is strictly forbidden for users to centrifuge toxic or pathogenic materials without taking preventive measures	CHS Lab

		Only use labeled centrifuge for hazardous materials and use proper test tube and cap to prevent spill. (test tube seal is broken/not sealed, ...). It is the responsibility of the users to implement appropriate sterilization procedures in the event that hazardous substances have contaminated the centrifuge and/or its accessories. The arrangement of test tubes in the machine must be counterbalanced and symmetrical to protect the instrument. During operation the machine does not make strange noises; if yes, the user is required to stop the machine in an emergency by pressing the "Stop" button. - The power button of the device is located on the bottom left the device. After turning on the machine, the users open the lid of the device before operating the centrifuge process. The lid of the machine is always closed during operation. - Check the rotor bores regularly, for residue and damage. With high g-values, the rate of glass tube breakage increases. Glass splinters have to be removed immediately from rotor, buckets, adapters and the rotor chamber itself. Fine glass splinters will scratch and therefore damage the protective surface coating of a rotor. If glass splinters remain in the rotor chamber, fine metal dust will build up, due to air circulation. This very fine, black metal dust will severely pollute the rotor chamber, the rotor, the buckets, and the samples. If necessary, replace the adapters, tubes and accessories, to avoid further damage. Clean the device with neutral cleaning solutions (pH 6-8), it is strictly forbidden to use alkaline solutions (pH > 8). The rotor made of metal and polypropylene (PP) can be sterilized at a maximum temperature of 121 °C and 20 minutes. It is strictly forbidden to sterilize the tube holder made of PP at 134 oC.	
11	Deep freezer (Brand: Esco – Model: HF3-400S-1), Chemical freezer (Brand: Artiko – Model: LRE 440), and Sample freezer (Brand: Artiko – Model: PR500)	- Arrange items inside the cabinet neatly, do not block the blower fan to interrupt the air circulation in the cabinet. All samples and chemicals must be closed and labeled according to the safety regulations of the laboratory. It is strictly forbidden to store chemicals that can react violently with each other. - The user must ensure that the freezer's door is closed tightly after use.	CHS Lab
12	Plastinated specimen preservation cabinet	- The user always ensures that the cabinet maintains the environment at a temperature below 25 ºC and humidity below 50%. The cabinet's door is always tightly closed by the electrical switch. - If the power is out for more than 30 minutes, the user turns the cabinet back on by the main control screen (Touch the "Operation Screen", then touch the "Start" button). - Only move the models out at the request of the lecturer, or in the presence of the laboratory's staff/faculty/teaching assistant during office hours.	CHS Lab
13	Ultraviolet–visible spectroscopy (Brand: Colo – Model: NOVEL-102S)	- Prepare samples and instruments: Use clean, unscratched cuvettes that are suitable for the wavelength range to be measured. Prepare sample solutions and blank solutions according to experimental requirements. - Turn on the power: Turn on the power switch of the machine and wait for the machine to fully start. Some machines require a warm-up time before use. - Start the software: Open the control software on the computer connected to the spectrometer. Make sure the software correctly recognizes the device and is ready for measurement. - Select measurement mode: Select the appropriate measurement mode such as scanning, kinetics or photometric. - Set parameters: Set the wavelength range to scan (for example: from 200 nm to 800 nm). Select the scanning speed, slit width and other parameters according to the experimental requirements. - Calibrate the machine with blank solution by placing the cuvette containing blank solution in the sample compartment of the machine. Close the sample compartment lid to avoid the influence of external light. Press the "Auto Zero" or "Blank" button on the software to calibrate the machine to 0 absorbance. - Prepare sample: Rinse the cuvette with sample solution several times before filling to ensure accuracy.	CHS Lab

		- Place the cuvette containing sample in the sample compartment of the machine. Close the sample compartment lid. Press the "Start" or "Measure" button on the software to start the measurement process. After measuring, save the data in a suitable format. - Finish and clean: Turn off the machine: After completing all measurements, turn off the machine according to the manufacturer's instructions. Clean the device: Rinse the cuvette with a suitable solvent and dry it before storing. Wipe the machine surface and sample compartment with a soft cloth to remove dirt and remaining sample.	
	Digital oscillators, waveform generators, DC power supply, bench multi-meters	- Safety check: Properly grounded - Work area. Inspect for any damage or abnormalities in the machine. - Start-up: Plug the cables into machine. Turn on the power button. Check if any errors are shown on screen - Operation: Use function buttons and cables to choose the operating function - Shutdown: After finishing, press the power button to turn off machine. Unplug the cables and hang back to original position. - Clean-Up and Maintain: maintain records of operating hours, maintenance tasks performed, and any abnormalities observed during operation.	CECS Lab
	Lab computers	- Authorized Use Only • Use only with permission. • Do not install or remove software without approval. - Before Use • Check all connections and peripherals. • Log in with your assigned account. • Report any issues to lab staff immediately. - While in Use • Use for academic or research purposes only. • Do not connect unknown USB devices. • No food or drinks near computers. • Save work regularly in the assigned folder. - After Use • Save and close all files. • Log out and shut down properly. • Turn off peripherals if necessary. - Security & Maintenance • Do not share your login credentials. • Lock the screen if you step away. • Report on malfunctions to lab supervisor or IT staff.	CECS Lab
	The Instron Universal Testing Machine/Instron 3369	- Safety check • Properly grounded - All guards & PPE - Work area • Ensure that the machine is properly calibrated and all safety features are functional - Prepare specimen and required tool • Ensure specimen meets the required dimensions and test conditions • Choose appropriate mode ▪ Tensile mode: Secure the specimen between upper and lower grips ▪ Compression mode: Place the specimen between the compression platens - Check and set parameter • Import test parameters into the control software (Bluehill): Load rate, Gauge length, Maximum load or strain limits • Verify the correct load cell is installed and calibrated • Ensure safety limits are enabled to prevent overloading or machine damage	CECS Lab

		- Mount specimen • Carefully place the specimen in the grips or platens, ensuring proper alignment. • Tighten grips or clamps securely to avoid slippage during testing - Start the machine: Turn-on the main power switch - Conduct test • Start the test using the control software (Bluehill) • Monitor the machine and specimen during testing to ensure everything runs smoothly. - Record and save data • Once the test is completed, save the test data and results for analysis. • If using extensometers, carefully remove them before removing the specimen. - Remove specimen • Disable the grips to release tension. • Safely remove the specimen from the grips or platens. - Shut down and clean-up: • Turn off the machine and software. • Clean the grips, platens, and machine surfaces to remove any debris. • Store tools and specimens properly for future use.	
	3D Printer (Ultimaker/Fusion3/Bambu)	- Safety check: • Properly grounded - All guards & PPE - Work area • Ensure that the machine is properly calibrated and all safety features are functional Prepare Filament and required tools • Make sure the right filament (PLA, ABS,… and diameter 1.75 or 2.85mm) • These required tools for achieving high quality model: Glue stick, spatula, key hex, screwdriver, wire brushes, USB, … - Prepare priting file via Ultimaker Cura/F3Slic3r/BamBuStudio software (for Ultimaker/Fusion3/Bambu machine) • Import 3D model file (*.STL,*.OBJ,*.FBX,*.3DS,*.IGES,*.STEP) into the software • Choose the correct machine model, material, and the desired settings (profile, layer height, infill, support and build plate adhesion) in the print settings panel. - Slice the model, preview stage, and save the resulting G-code file to a USB drive and insert it into the 3D printer. - Start the machine: Turn-on the main power switch - Load Filament: • Lift the switch to insert the spool of filament into the designated holder on the printer. • Follow the instructions on the touchscreen to feed the filament into the printer. • Wait until the filament is extruded smoothly from the nozzle. - Start the print job: • Choose the G-code file to print • Monitor the print progress during operating to ensure that the printer operates well. - Post-Printing: • Once the print is complete, wait for a few minutes to cool the print, then carefully remove the printed object from the build plate. • Remove any support structures using appropriate tools. - Shutdown: Turn off the machine	CECS Lab

		- Clean-up: • Remove any debris or swarf from the machine and work area. • Clean the build plate and nozzle after every print to maintain printer performance. • Dispose of waste material properly.	
	CNC Lathe/HAAS/TL-1-EDU	- Power-On Machine: Press POWER ON - Release EMERGENCY STOP - Press RESET - Press POWER UP - Press CANCEL/CYCLE START/HANDLE JOG - Load Program: • Verify the program and toolpaths using the machine's simulation mode - Setup Workpiece: • Securely mount the workpiece in the chuck jaws or collet. • Jog the machine to the desired starting position. • Set work coordinates using the machine's coordinate system. - Setup Tools: • Use the tool length offset probing feature to measure tool lengths accurately. • Verify tool offsets and make any necessary adjustments. - Setup Machine: • Set spindle speed and feed rates according to the material and tooling being used. • Adjust coolant settings as necessary for optimal chip evacuation and tool lubrication. - Executing the Machining Operation: • Initiate the CNC program and monitor the turning process closely. • Check for any abnormal sounds, vibrations, or tool wear during turning. • Make adjustments to cutting parameters as needed for optimal performance. - Finishing and Inspection: • Upon completion of turning, inspect the finished workpiece for dimensional accuracy and surface finish. • Use measuring tools such as calipers and micrometers to verify dimensions. - Shut-down Machine: • Press Power off • Clean the work area and machine surfaces. Return tooling to its designated storage location.	CECS Lab
	CNC Milling/HAAS/Mini Mill-EDU	- Power-On Machine: Press POWER ON - Release EMERGENCY STOP - Press RESET - Press POWER UP - Press CANCEL/CYCLE START/HANDLE JOG - Load Program: Verify the program and toolpaths using the machine's simulation mode - Setup Workpiece: • Securely mount the workpiece in the machine vise or fixture. • Set up work offsets as necessary using the machine's probing system. - Setup Tools: • Use the tool length offset probing feature to measure tool lengths accurately. • Verify tool offsets and make any necessary adjustments. - Setup Machine: • Set spindle speed and feed rates according to the material and tooling being used. • Adjust coolant settings as necessary for optimal chip evacuation and	CECS Lab

		tool lubrication. - Executing the Machining Operation: • Initiate the CNC program and monitor the machining process closely. • Check for any abnormal sounds, vibrations, or tool breakage during machining. • Make adjustments to cutting parameters as needed for optimal performance. - Finishing and Inspection: • Upon completion of machining, inspect the finished workpiece for dimensional accuracy and surface finish. • Remove the workpiece from the machine and deburr edges as necessary. - Shut-down Machine: • Press Power off • Clean the work area and machine surfaces. Return tooling to its designated storage location.	
	Surface grinder/Sumore/SP2506	- Safety check: Properly grounded - All guards & PPE - Emergency Stop button - Cutting tools - Work area - Machine setup: • Adjust the saddle to the desired position. • Adjust the appropriate grinding wheel based on material specifications and job requirements. • Ensure the wheel guard is properly adjusted and securely in place. - Workpiece setup: • Securely mount the workpiece on the chuck or magnetic table. • Ensure the workpiece is properly aligned and clamped to prevent movement during operation. • Check for any debris or foreign objects on the workpiece surface. - Start-up: Turn on the main power switch - Activate the hydraulic system (if applicable) - Start the spindle motor. - Wheel Dressing: • Dress the grinding wheel if necessary to maintain its shape and sharpness. • Use a dressing tool and follow recommended procedures provided by the manufacturer. - Grinding Process: • Lower the grinding wheel to the desired depth using the handwheel or automatic controls. • Start the grinding operation by moving the table or saddle in a smooth and controlled manner. • Maintain a consistent feed rate to achieve uniform grinding. • Monitor the surface finish and dimensions of the workpiece throughout the grinding process. - Coolant Usage (If Applicable): • Activate the coolant system to prevent overheating of the workpiece and grinding wheel. • Adjust coolant flow rate as necessary to maintain optimal grinding conditions. - Monitoring: • Regularly inspect the grinding wheel for signs of wear or damage. • Monitor machine parameters such as spindle speed, feed rate, and coolant flow. - Shutdown: Turn off the spindle motor - Deactivate the hydraulic system if applicable - Turn off the main power switch	CECS Lab

		- Clean-Up: • Remove any debris or swarf from the machine and work area. • Wipe down the machine surfaces and chuck/table to prevent corrosion • Dispose of grinding dust and waste material properly.	
	Cutting Laser/GCC LaserPro X252	- Safety check: Properly grounded - All guards & PPE - Emergency Stop button - Work area • Ensure that the machine is properly calibrated and all safety features are functional - Programm/Workpiece Setup • Load the material to be cut onto the cutting bed securely. • Launch the design software (CorelDraw) on the PC and prepare the cutting file (dwg) - Start-up: • Turn on the main power switch of GCC X252 & the Chiller machine & Air compressor - Setting Parameters: • Set the laser power, speed, and frequency according to the material being cut and its thickness. • Adjust the focus of the laser beam based on the material thickness for optimal cutting results. • Verify that the exhaust system always operates well to remove smoke and fumes generated during cutting. - Cutting Operation: • Import the cutting file into the Corel software. • Position the cutting path and adjust the parameters if necessary. • Initiate the cutting process and monitor the machine closely during operation. - Post-Cutting Inspection: • Once the cutting process is complete, power off the laser. • Remove the cut material from the cutting bed carefully. • Inspect the cut pieces for quality and accuracy. • Turn off the machine & PC • Clean the cutting bed and surrounding area to maintain cleanliness and prevent debris buildup.	CECS Lab
	Hydraulic press/Huvema/HU 200 MMH	- Safety check: Properly grounded - All guards & PPE - Emergency Stop button - Work area • Inspect for any leaks, damages, or abnormalities in the hydraulics system. - Tooling Setup • Select the appropriate tooling or dies based on the pressing requirements. • Install and secure the tooling in the press bed and ram. - Start-up: • Turn on the main power switch. • Activate the hydraulic system and allow it to build pressure. - Workpiece Placement: • Position the workpiece on the lower tooling or die. • Ensure the workpiece is properly aligned and supported to prevent tilting or shifting during pressing. - Adjustment: Adjust the stroke length and pressure settings as per the pressing requirements. - Pressing Operation: • Activate the press cycle using the control panel. • Monitor the pressing operation closely, ensuring the workpiece remains stable and doesn't exceed the press capacity.	CECS Lab

		• Release the pressure once the pressing operation is completed. - Shutdown: • Turn off the hydraulic system and allow pressure to release completely. • Return all controls to their neutral position. • Turn off the main power switch. - Workpiece Removal: • Carefully remove the pressed workpiece from the press bed. • Use appropriate lifting equipment if necessary. - Clean-Up: • Remove any debris or excess material from the press bed and tooling. • Wipe down the machine surfaces to prevent corrosion.	
	Manual Lathe/Sumore/SP2110-I	- Safety check: Properly grounded - All guards & PPE - Emergency Stop button - Cutting tools - Work area - Machine setup: • Check and adjust spindle speed, feed rate, and depth of cut settings as per the workpiece material and job requirements. • Securely mount the chuck or faceplate on the spindle. • Install and adjust the cutting tool holder and cutting tool. - Workpiece setup: • Mount the workpiece securely on the chuck or faceplate. • Ensure the workpiece is properly centered and aligned with the lathe axis. • Check for any debris or foreign objects on the workpiece surface. - Start-up: • Turn on the main power switch - Adjust spindle speed and direction as needed. • Ensure the lathe machine is in the correct operating mode. - Facing Operation: • Bring the cutting tool close to the workpiece without making contact. • Set the cutting depth and feed rate. • Engage the feed mechanism and begin the facing operation. • Monitor the cutting process and adjust the feed rate as necessary. - Turning Operation: • Position the cutting tool to the starting point on the workpiece surface. • Set the desired depth of cut and feed rate. • Engage the feed mechanism and begin the turning operation. • Continuously monitor the cutting process, adjusting the depth of cut and feed rate as needed for optimal results. - Thread Cutting (if applicable): • Set up the lathe machine for thread cutting according to the thread specifications. • Use the appropriate threading tool and engage the feed mechanism. • Monitor the thread cutting process and ensure proper thread pitch and depth. - Shutdown: Complete the turning operation - Turn off the spindle motor - Turn off the main power switch - Clean-Up: • Remove any chips, swarf, or debris from the machine and work area. • Wipe down the surface of the lathe machine and chuck/faceplate to prevent corrosion. • Dispose of cutting waste properly.	CECS Lab
	Manual Milling and Drilling/Sumore/SP2237	- Safety check: Properly grounded - All guards & PPE - Emergency Stop button - Cutting tools - Work area	CECS Lab

		- Machine setup: • Check and adjust spindle speed, feed rate, and depth of cut settings as per the workpiece material and job requirements. • Install and secure the appropriate cutting tool in the spindle. - Workpiece setup: Securely mount the workpiece in the machine vise or with clamps. - Start-up: • Turn on the main power switch - Adjust spindle speed and direction as needed. • Ensure the machine is in the correct operating mode. - Milling Operation: • Position the cutting tool above the workpiece surface. • Set the desired depth of cut and feed rate. • Engage the feed mechanism and begin the milling operation. • Move the cutting tool across the workpiece surface in the desired direction. • Monitor the milling process and adjust the feed rate and depth of cut as necessary for optimal results. - Drilling Operation: • Select the appropriate drill bit size for the desired hole diameter. • Position the drill bit over the desired location on the workpiece surface. • Engage the feed mechanism and begin the drilling operation. • Apply cutting fluid or coolant if necessary to lubricate the drill bit and prevent overheating. • Monitor the drilling process and adjust feed rate and spindle speed as needed. - Shutdown: Complete the turning operation - Turn off the spindle motor - Turn off the Emergency Stop button - Clean-Up: • Remove any chips, swarf, or debris from the machine and work area. • Wipe down the milling and drilling machine surfaces and workpiece to prevent corrosion. • Dispose of cutting waste properly.	
	Rotary Screw Air Compressor/K-MAX 7,5-10-270	- Safety check: • Properly grounded - All guards & PPE - Emergency Stop button - Work area • Inspect for any leaks, Drain the water from the tank. - Start-up: • Turn on the main power switch. • Check the control panel for any error messages or warnings. Release the Emergency Stop button and reset all warnings (If needed) • Start the compressor unit and allow it to reach operating speed. - Pressure Adjustment • Set the desired operating pressure using the pressure control knob or digital interface. • Monitor pressure levels on the pressure gauge. - Operation: • Monitor the compressor for any unusual noises or vibrations. • Ensure proper airflow and pressure output. • Check for any signs of overheating or excessive pressure build-up. • Maintain a safe distance from moving parts and hot surfaces.	CECS Lab

		- Shutdown: • When the desired pressure level is reached, turn off the compressor unit automatic • Close any isolation valves or vents to prevent air leaks (if not using) • Wait for the compressor to cool down before performing any maintenance tasks. - Clean-Up and Maintain records of compressor operating hours, maintenance tasks performed, and any abnormalities observed during operation.	
	Semı Auto Bandsaws/Bekamak/BMSY-320	- Safety check: • Properly grounded - All guards & PPE - Emergency Stop button - Work area • Inspect the bandsaw blade for any damages or defects. - Cutting tool/Workpiece Setup • Select the appropriate bandsaw blade based on the material to be cut. • Install and tension the bandsaw blade according to manufacturer guidelines. • Adjust the workpiecel support stand or workpiece clamping mechanism as needed. - Start-up: • Turn on the main power switch. Release Emergency Stop button (if needed) • Turn on the Start button • Adjust suitably blade up and open the clamping mechanism with the height of workpiece • Adjust blade speed and tension as per material specifications. - Workpiece Positioning: • Push the workpiece into the clamping mechanism at the correct position to be cut • Adjust the clamping mechanism to clamp the workpiece clamp the workpiece tightly to ensure it is securely held in place and won't shift during cutting. - Cutting Operation: • Activate the bandsaw machine, coolant lubrication and allow it to reach full speed. • Adjust the cutting parameters such as feed rate and blade pressure according to the material and cutting requirements. • Initiate the cutting cycle using the semi-automatic controls. • Monitor the cutting process and make any necessary adjustments to ensure proper cutting performance. - Post-Cutting Inspection: •Inspect the cut surface for quality and accuracy. • Check for any signs of blade wear or damage. • Remove any burrs or sharp edges from the workpiece. - Shutdown: Turn off the bandsaw machine - Clean-Up: • Remove any debris or swarf from the bandsaw machine and work area. • Wipe down the machine surfaces to prevent corrosion. • Dispose of waste material properly.	CECS Lab
	Vertical bandsaw/Huvema/HU 2613 VBS Super	- Safety check: • Properly grounded - All guards & PPE - Emergency Stop button - Work area • Inspect the bandsaw blade for any damages or defects.	CECS Lab

		- Cutting tool/Workpiece Setup • Select the appropriate bandsaw blade based on the material to be cut. • Install and tension the bandsaw blade according to manufacturer guidelines. • Adjust the workpiecel support stand or workpiece clamping mechanism as needed. - Start-up: • Turn on the main power switch. • Adjust blade speed and tension as per material specifications. • Ensure the bandsaw blade tracking is correct. - Workpiece Positioning • Position the workpiece on the material support stand or clamping mechanism. • Ensure that the workpiece is right position - Cutting Operation: • Activate the bandsaw machine and allow it to reach full speed. • Carefully feed the workpiece into the bandsaw blade, maintaining a steady and even pressure. • Maintain a safe distance from the blade and ensure hands are clear of the cutting path. - Post-Cutting Inspection: • Inspect the cut surface for quality and accuracy. • Check for any signs of blade wear or damage. • Remove any burrs or sharp edges from the workpiece. - Shutdown: • Turn off the bandsaw machine and wait for the blade to come to a complete stop. • Release tension on the bandsaw blade according to manufacturer instructions. - Clean-Up: • Remove any debris or swarf from the bandsaw machine and work area. • Wipe down the machine surfaces to prevent corrosion. • Dispose of waste material properly.	
	Electric Soldering Station	- Safety check: • Wherever possible, use lead-free solder • Check general work area to ensure no slip/trip hazards are present • Ensure bench top work area is clear - Inspection and Maintenance • Examine the power lead and soldering iron/heat gun for obvious damage,including tip damage • Wet the sponge • Turn on fan prior to starting the soldering iron or heat gun • Leave the soldering iron/heat gun in the stand when it is warming up	CECS Lab

		- Standard operation and safety check: • Adjust the tip temperature to suit the required thermal transfer during soldering (nominally 340ºC for tin/lead solder, 370ºC for lead-free) • Place the soldering iron/heat gun back in the stand immediately following each use • Avoid positioning your head directly over the soldering process. Soldering creates flux fumes that can irritate the lungs and eyes, and may cause sensitization • Clean the hot tip with either the brass coil or a damp sponge before tinning • "Tin" the tip by placing some solder onto the iron. This allows for more thermal conductivity with the conductor you are about to solder • When trimming leads, contain the lead with a finger to prevent the cut lead becoming a projectile • Press the hot iron against the joint between the two conductors you wish to solder. Be careful the tip does not also touch nearby components so as not to heat them up • Feed solder into the heated joint • When using flux or solder paste, always clean the work piece upon completion to remove residue • Allow all tools and work pieces to cool down before handling or storing - Shutdown: • Ensure that the soldering iron tip is well tinned before switching off the soldering iron • Switch off, unplug, and allow the soldering iron/heat gun to cool down before storing - Clean-Up: • Leave work bench in a safe, clean and tidy state • When using a solder containing lead wash hands after completion	