SEM SOP

Short Version

Sample preparation	Step1: Set the sample on the sample holder. There are several sample holders depending on sample size and shape. Step 2: Put the carbon tape on one end of the sample if sample is nonconductive. Note: Be careful about sample size (to high sample can damage sensitive parts of the SEM)
User login and placing the sample holder at the SEM sample unit	Step1: Write basic data to the user book (Name, date, time, account number, etc) Step2: Log in to the computer (Ctr+Alt+1 for the first screen and Ctrl+Alt+2 for the second screen) Step3: Hit icon on the desktop for SEM software window starting Step4: Put the gloves on Step5: Push VENT button and hold for a few second. When the light stop flashing unit is ready. Step6: Open sample unit (pull manually to open) Step7: Set the prepared sample holder on its position at the sample unit. Note: There is flat side of the sample holder-should be set forward during sample holder positioning. Set sample holder by one hand if possible Step8: Check whether the sample holder is set correctly Step9: Close the sample unit (manually- push forward to close). Hold the sample unit by one hand and push PUMP button and hold for a few seconds until you hear the sound of pumping. Note: during setting the sample and closing the sample unit the HT button at SEM window is not active. Note: Do not live any data at the desktop. Make sure that you have subfolder to storage your data.
Sample investigation	Step1: When HT button is active start your work Step2: Set the sample to the right position to have good view of the area you want to observe. Note: there are three ways to set the sample at the right position. Manually, with the screws at the SEM sample unit, with the buttons at the command table-joystick and by software (input X and Y coordinates). There is only one way to set Z coordinate manually by the screw at the SEM sample unit. Note: Be very careful with Z direction moving. Step3: Hit the SCAN2 button at the working window Step4: After setting Focus the sample (focus by minimum magnification)

	Note: Focus manually with the buttons at the command table (Focus + coarse = fast focusing). Focus can be done by using software buttons at the working window. Step5: Set the spot size around 60 and Acc Volt. at 20keV Step6: Set the brightness and contrast Note: There three ways for setting, by using manual command at the command table, by buttons at the working window menu and automatic settings with ACB button. Step7: Increase magnification to set the parameters for sample observation Note: Always use higher magnification for setting parameter than one you want to work on. (for example, use 1000X if you want to work with 100X) Step8: Focus the image Step9: Use OL-WOBBLER command from tools menu to set objective aperture properly. Note: correct manually with screws at the SEM sample unit Step10: Correct stigmation with buttons from command cable Note: Hit SCAN1 and use the same buttons as for contrast and brightness Step11: Focus the image Step12: decrease the magnification to your working magnification Step13: Focus the image Step14: Check contrast and brightness if necessary Note: If you want to see picture at the small window and compare some pictures press right click and chose snap shot option or import picture from the folder
Working distance setting	Step1: Check the Z coordinate and working distance at the working window Note: working distance is important for EDS analysis. Optimum working distance for EDS analysis is 12-14 mm Note: BE CAREFUL WITD SETTING WORKING DISTANCE Step2: Focus the image Step3: Decrease the working distance (decrease Z value for few mm) Step4: Focus the image Step5: Check working distance Repeat these steps until working distance reach 12-14 mm

	Note: BE CAREFUL
Data saving	Step1: Hit SCAN3 and FREEZ Step2: Hit save data from the menu Step3: Open your Subfolder Step4: Give the name to the picture and save it
Working with BSEI	Note: use this option if you have multiphase sample Step1: From the menu SIGNAL at working window chose BSEI Step2: Chose appropriate option Compo or Topo or Shadow, depending on what you want to investigate Note: When you finish return SIGNAL at SEI
EDS Analysis	Note: Sample mast be flat and polished for this type of analysis Step1: Go to screen 2 (Ctrl + Alt + 2) Hit the icon for starting EDS software Step3: open the sample image at the screen 2 Step4: Chose the point where you want to analyze the sample Step5: Follow the diagram for completing action for EDS analysis Step6: Chose the type of data from the template menu you want to have at the end report Note: Deadtime must to be between 40 to 60 % for correct results
Shutting of procedure	Step1: Set the minimum magnification Tep2: Decrease Z at the minimum position Step3: Focus the image Step4: Hit the HT button Step5: Put the gloves on Step6: Hit the VENT button Step7: Open the Sample unit Step8: Take off the sample holder Step9: Close the sample unit and PUMP Step10: Close the software

	Step11: Put the sample and sample holder at the right place
NOTE	If you have any comment about SEM or problem write it at the user book