**SoP**

**(Department of Environmental Science)**

*Step-by-Step Guide for Using Instruments in an Environmental Lab*

***1. Preparation***

* Review the instrument’s manual and lab SOPs.
* Ensure the instrument is clean and ready for use.
* Gather all necessary reagents, standards, and supplies.

***2. Calibration***

* Use certified standards to calibrate the instrument.
* Record calibration results and ensure they meet acceptable limits.

***3. Sample Preparation***

* Prepare samples according to the approved method (e.g., filtration, dilution, extraction).
* Label samples clearly to avoid mix-ups.

***4. Instrument Setup***

* Power on the instrument and allow it to stabilize.
* Load the required software or program for analysis.
* Adjust parameters (e.g., temperature, flow rate, wavelength) as specified.

***5. Quality Control Checks***

* Run blanks, standards, and control samples to verify instrument performance.
* Confirm results are within acceptable ranges before proceeding.

***6. Sample Analysis***

* Load samples into the instrument in the correct sequence.
* Monitor the process for errors or anomalies.

***7. Data Collection***

* Record raw data directly from the instrument or software.
* Save data securely and back it up if necessary.

***8. Post-Analysis Procedures***

* Clean the instrument and accessories to prevent contamination.
* Shut down the instrument properly if not in use.

***9. Data Verification***

* Review data for accuracy and completeness.
* Perform calculations or transformations as required.

***10. Reporting***

* Prepare a report with analysed results, including any deviations or issues.
* Submit the report for review and approval.

***11. Maintenance***

* Perform routine maintenance as per the instrument’s schedule.
* Document maintenance activities and any repairs.

***12. Troubleshooting***

* Address any issues encountered during analysis.
* Document corrective actions taken.

**List of Instruments and Software**

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| **Wet Laboratory** | **Dry Laboratory** |
| 1. Atomic Adsorption Spectrophotometer (AAS)  2. UV-Vis Spectrophotometer  3. CHNS Analyzer  4. Ion Chromatograph  5. Automated Solvent Extractor  6. Gas Chromatograph (GC)  7. Gas Chromatograph Mass Spectroscopy (GCMS)  8. Kjeldahl Nitrogen Assembly  9. Microwave Digestion System  10. Rotary Evaporator  11. Flame Photometer  12. Incubator Shaker  13. BOD Incubator  14. Respirable Dust Sampler | 1. IBM/HP/Fujitsu (Unix/Linux) Servers  2. Weather and Climate Models  3. Climate Data  4. GIS Software (ArcGIS 10.2)  5. Atmospheric Lightning Sensor under Lightning Location Network (LLN) program by the Ministry of Earth Science, Government of India |