**Computational Methods in Environmental Physics**

**Homework 1: Working with Pollution Data**

Jazzie R. Jao, MSc | jazzie.jao@dlsu.edu.ph

**Deadline**: May 19, 2025 11:59 PM

**Highest Possible Score**: 75 MARKS

**Instructions:**

1. This is a group activity. Use the groupings in canvas.

2. You can use either python or MATLAB.

3. You are required to submit the pdf file of the answers to the questions below and the corresponding .ipynb or .mat file/s of your work.

**Questions**

1. Use line plot to visualize the daily average of ALL pollutant measurements in India. Observe proper axes labelling, with corresponding units and titles. [10 MARKS]
2. Change the time resolution of the time series: instead of daily average, plot the monthly average of ALL pollutant measurements in India. Observe proper axes labelling, with corresponding units and titles. [10 MARKS]
3. What can you observe between the daily average and monthly average of the pollutants? [10 MARKS]
4. What is the comparative difference in pollution levels between the lockdown period in 2020 and the same calendar months in 2019? Do this for each pollutant and express the difference in terms of percent change. Use the daily average. [15 MARKS]
5. Which specific air pollutants (PM2.5, PM10, NO₂, SO₂, CO) showed the most significant reductions during the lockdown, and in which regions? Use the daily average. [20 MARKS]
6. Obtain a correlation heatmap of ALL pollutants. Which pair of pollutant expressed the highest correlation? Use the daily average. [10 MARKS]