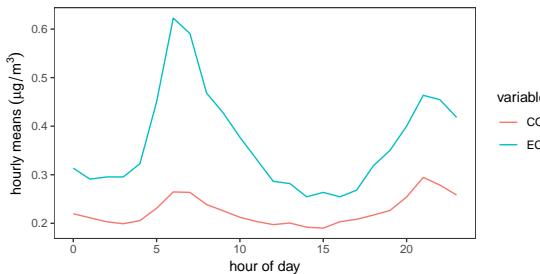


There will be a mix of qualitative and data interpretation questions. The qualitative questions are drawn from lecture and data analysis exercise. The data interpretation portion will be drawn from the data analysis exercise.

2 cheat sheets on A4 paper (front and back) are permitted. These sheets can be typed.

Examples of qualitative and data analysis portions from past exams are shown below (some have been reworded). (The exam is multiple choice and a set of possible answers are provided for each question.)

- Particulate matter is composed of which states of matter?
- Which trace compound(s) are involved in acid precipitation?
- What role does black carbon play in climate change?
- Under what conditions would you expect lognormally distributed pollutant concentrations?
- What is the technique used for reference measurements of  $PM_{10}$  in Switzerland?
- Minimum work for separating  $CO_2$  from the atmosphere is estimated from what principle?
- What are the major oxidants in the atmosphere?
- Which compounds are directly associated with smog events?
- Why might  $O_3$  concentrations increase downwind when you decrease  $NO_x$  emissions?
- What is the largest source of ammonia emissions in Europe?
- What are the major components of atmospheric aerosols?
- Why is there is a similar diurnal profile between CO and EC concentrations as observed below?



- Why does  $PM_{10}$  have a weaker seasonal variation than  $O_3$  as observed below?

