ENV-400  
**Air pollution and climate change**  
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### Summary
A survey course describing the origins of air pollution and climate change

### Content
- Atmospheric pollutants and their effects on the environment
- Emissions related to air pollution and climate change
- Measurements of air pollutants, greenhouse gases and meteorological conditions
- Air quality models
- Environmental regulations and abatement strategies related to air pollution and climate change

### Keywords
Atmospheric chemistry, air quality, climate change, air pollution, meteorology, aerosols

### Learning Prerequisites
**Recommended courses**
Physics and Chemistry of the Atmosphere (ENV-320)

**Important concepts to start the course**
- Differential, integral, and vector calculus
- Linear algebra
- Chemistry (reaction rates, chemical thermodynamics)
- Basic programming concepts

### Learning Outcomes
By the end of the course, the student must be able to:
- Identify compounds recognized as pollutants and regulated in various countries
- Categorize emission or production sources and removal mechanisms of various pollutants.
- Compare methods and practical issues concerning measurement of gas, particles, and meteorological variables.
- Describe challenges in modeling atmospheric pollution/climate change phenomena.
• Explain the dependence of air quality on emissions, meteorology, and atmospheric chemistry.
• Assess / Evaluate the impacts of human activity on air pollution and climate change.
• Describe potential mitigation strategies as possible solutions to air pollution/climate change problems.
• Interpret atmospheric observations

Transversal skills
• Access and evaluate appropriate sources of information.
• Plan and carry out activities in a way which makes optimal use of available time and other resources.
• Assess one's own level of skill acquisition, and plan their on-going learning goals.

Teaching methods
Lectures and exercises (quantitative and programming)

Expected student activities
Lecture attendance, exercise assignments

Assessment methods
30% exercise assignments, 70% final exam

Resources
Bibliography
http://acmg.seas.harvard.edu/people/faculty/djj/book/

Ressources en bibliothèque
• Fundamentals of Air Pollution Engineering / Flagan
• Physical Chemistry / Atkins
• Aerosol Technology / Hinds
• Air Pollution / Wark
• Chemistry of the Upper and Lower Atmosphere / Finlayson-Pitts