Course Outline
ENVE 5702: Atmospheric Aerosols

Instructor: Amir Hakami
Room 2374 ME, ext 8609, amir_hakami@carleton.ca
Office hours: Fridays 10:00 - 12:00

Course components:
Lectures: 3 hours a week, Mondays 17:35 – 20:35

Evaluation:
20 % Assignments
20 % Project and presentation
25 % Discussions and review
35 % Final exam

All examinations are closed book and closed notes and non-cumulative (i.e. the examined content will not overlap between exams). You will be provided with all formulae needed in the exam, and therefore, no notes of any kind shall be brought to the exam. The final examination is for evaluation purposes only and exam papers will not be returned.

Communications, course material, online discussions:
All course materials will be posted to the connect web page for the course. Electronic communications with me must be carried out through your official Carleton email only. Students can stop by my office outside official office hours, but be aware that I may be busy and ask you to come back at a later time. All assignments should be turned in at the beginning of the class when they are due. Penalties for late submissions are 25 % within 24 hours and 50 % between 24 and 72 hours. Submissions after 72 hours receive no credit. Students can discuss assignments with each other, but the submitted material needs to be your individual work. Make sure what you submit for your reports and assignments is your work performed for the purpose of this specific course (i.e. closely follow institutional guidelines on plagiarism).

Course and Lecture layout (subject to modifications):

Number of Lectures	Topics
2	Introduction to aerosols, populations and distributions, composition, atmospheric aerosols
3	Single-particle dynamics, settling, motion in external fields, drag force, continuum vs. non-continuum regimes, instrumentation concepts, etc
3	Population dynamics – nucleation and coagulation, phase transfer and thermodynamics of aerosols, water uptake
1	Aerosol optics, scattering of light, visibility, aerosols and climate, direct and indirect aerosol effects, aerosols and clouds
1-2	Secondary (organic and inorganic) aerosols, instrumentation, aerosols and health, aerosols and climate

Textbooks:

There is no required textbook for the course, however, the following two books are highly recommended for those interested in, or working on aerosols.

*Note that your main source for the course contents shall be your class notes. Class notes will **NOT** be provided as power-point presentations or in other forms – you need to take notes in the class.*

- Seinfeld, J. H.; Pandis, S. N., Atmospheric chemistry and physics: from air pollution to climate change, Wiley-Interscience, 2006 (2^{nd} ed). [Often considered the "air pollution bible" – if you expect your work to be on air pollution you may want to have this book].

- Hinds, W. C., Aerosol Technology: properties, behavior, and measurement of airborne particles, Wiley-Interscience, 1999 (2^{nd} ed).