SUBJECT: Polluants Diffusion in the Atmosphere
NUMBER OF CREDITS: 5
YEAR/ SEMESTER: 3/1 or 3/2
NUMBER OF HOURS/WEEK: 2 course + 2 laboratory
NUMBER OF WEEKS: 14
SUBJECT TYPE: optional/specialty

COURSE OBJECTIVES:
1. Knowledge of the types of problems relating to air pollution and the possibilities to solve them.
2. Knowledge diffusion equations in Euler descriptions for different types of sources.
3. Knowledge of the equations and physical quantities for the statistic description of diffusion.
4. Description of the Gaussian diffusion models.

CONTENT:
I. Introduction to air pollution problems
    I.1. Types of air pollution problems
    I.2. Sources of air pollution
    I.3. Effects of air pollution
II. Gradient transport theories
    II.1. Eulerian approach to describing diffusion
    II.2. Molecular diffusion
    II.3. Turbulent diffusion
    II.4. Constant K-theory
    II.5. Variable K-theory
III. Statistical theories of diffusion
    III.1. Lagrangian approach to describing diffusion.
    III.2. Statistical theory of absolutes diffusion
    III.3. Statistical theory of relative diffusion
    III.4. Experimental verification of statistical theories
IV. Similarity theories of dispersion
    IV.1. Dispersion in stratified shear flows
    IV.2. Lagrangian similarity theory for atmospheric boundary layer
V. Gaussian diffusion models
    V.1. Basis and justification for Gaussian models
    V.2. Empirical dispersion parametrization schemes
    V.3. Model evaluations and uncertainties

BIBLIOGRAPHY:

1. Beychok, Milton R., Fundamentals of Stack Gas Dispersion, (2005).
2. Arya, S. Pal, Air Pollution Meteorology and Dispersion, Oxford University Press, 1998
3. Barrat, Rod (2001). Atmospheric Dispersion Modelling, 1st Edition. Earthscan Publications

WORKING LANGUAGE: Romanian
EVALUATION: written examination
EVALUATION MODE: colloquium