Module Title:
Atmospheric analysis

Module Code:
AM0502

Maximum Number of Students:
30

Total ECTS Credits
This should be the sum of the credits for each of the semesters in which the module is to run.
2

Notional Learning Hours
(a) Contact Time - 15__h
(b) Private Study - 5__ h

Format of Teaching:
Lectures 10__h
Laboratories or Practicals 3___h
Other(seminars) 2___ h

Teaching Strategy:
Please show how the contact hours are to be allocated in terms of the type of class involved.
Lectures will cover the following issues: the basic atmospheric chemistry, air pollution, general problems of environmental analysis, sampling, sample preparation for analysis, analytical techniques of final analysis, typical analyzers, air monitoring. Lectures will prepare the students to analyze practical issues and understand and/or design procedures needed in specific practical applications (case studies). Some aspects of air monitoring will be discussed in the form of seminars prepared by the students. The students in 3-5 person groups will carry out analysis of air (depending on instrumentation available).

Convener:

Professor Waldemar Wardencki, PhD, DSc

University / Department:
The name of the University and Department responsible for the module.
Gdańsk University of Technology, Faculty of Chemistry, Department of Analytical Chemistry

Language of Tuition:
English

Module Description - The Purpose or Aims:
This should specify the purpose of the module where it fits into the programme specification and what it aims to provide. Please list the Aims in numerical order.
Specifically the following aims should be achieved:

1. to acknowledge the student with the basic atmospheric chemistry and air pollution.
2. to provide the students with knowledge on the techniques of air sampling
3. to familiarize the students with principles of techniques used for final analysis
4. to provide the students with modern instrumentation (monitors, analyzers) used for air monitoring
5. to form skills in students to choose and apply sampling procedure, sample preparation technique and adequate instrumentation.

Specific Learning Outcomes for this module: (contributing to general learning outcomes GLO 1 – GLO 10)
Learning Outcomes should provide statements which articulate what the student has achieved upon completion of the course. What will a student know, understand or be able to do?

1. Getting general orientation in the scope and opportunities of atmospheric analysis (GLO3)
2. Understanding the advantages and limitations of individual techniques used in analysis of air (GLO3)
3. Learning the instrumentation needed in the techniques, sample pretreatment methods employed, typical analytical procedures (GLO3, 4)
4. Learning by examples (case studies) the application of the techniques in question for solving chosen specific problems in environmental analysis (GLO4, 6)

Summary of Course Content:
This should be a summary paragraph of list of the topics to be covered by the module.
Global atmosphere (structure, physical and chemical parameters of the atmosphere)
Air pollution (classification, emissions, effects)
Atmospheric aerosols (particles, aerosols and clouds)
Environmental monitoring strategies
Sampling techniques for atmospheric samples
Analytical techniques for identification and quantification of reactants and reaction products
Measurements of atmospheric trace gases
Application of biological methods in analysis of atmospheric air pollution
Total parameters for studies of atmospheric air
Remote sensing of pollutants

Transferable Skills Taught:

Please list in numerical order the key skills taught e.g. communication, information technology, interpersonal skills, teaching/study skills. Please relate these to benchmark statements.

Communication: Usage of the relevant terminology

Assessment Methods:

Details of assessment methods should include forms of assessment and the contribution of each to the summative assessment of the module. The relationship to the learning outcomes of the module should be explicit and the numbers of the various learning outcomes should be attached to the assessment methods listed. Please list in numerical order

Final assessment will be done on the basis of a written test, laboratory report and grade for preparation of seminar.

Assessment Criteria:

Details of assessment methods should include forms of assessment and the contribution of each to the summative assessment of the module. The relationship to the learning outcomes of the module should be explicit and the numbers of the various learning outcomes should be attached to the assessment methods listed. Please list in numerical order.

Treshold:

Achieving 50% score at the closed question test and a minimum understanding of the issue covered by the open question.

Good:

Minor errors in the closed question test (in more advanced issues). Solid and thorough covering the open issue.

Excellent:

Almost perfect closed test score. Individually suggested by the student (and accepted by the instructor) case study in the open question issue.

Resource Implications of Proposal and Proposed Solutions:

Details on any resources required and should be included. Please also list e.g core texts; recommended reading material; equipment; films etc.

Recommended textbooks:

1. B.J.Finlayson-Pits, J.N.Pitts, Jr., Atmospheric Chemistry, Fundamentals and Experimental Techniques, John Wiley@ Sons, any edition
2. Zhang Chunlog, Fundamentals of environmental sampling and analysis, John Wiley@ Sons, 2007
3. R.N. Reeve, Environmental analysis, John Wiley@ Sons, 1994

Resources needed: multimedia projector, usage of the laboratory facilities is planned when the module is taught at the home university (otherwise, individual contacts are needed to establish whether an opportunity exists to carry out any lab experiment, if not – seminars will be adequately enhanced).

Pre-Requisites:

Any module(s) which must have been taken prior to the current module, or any specific background required to take this module.

Basics of analytical chemistry