

## Course of Lectures

**“Historical and modern assessment of environmental pollution and sustainability”**

***for PhD students, Gdansk University of Technology, Gdansk, Poland***

**Lecturer:** *Prof. Dr. Vasil Simeonov, DSc.*

**Affiliation:** *Faculty of Chemistry and Pharmacy, University of Sofia “St. Kl. Okhridski”, Sofia, Bulgaria*

**Horarium:** *15 academic hours; April 23 – April 27, 2018*

**Abstract:** The pollution risk assessment is a very special issue in the modern science and involves many scientific disciplines including philosophy and history. The set of lectures will present a specific historical overview of the human interest and engagement with environmental pollution based on various case studies. Parallel to this the modern concept of sustainability will be shown based on sets of specific indicators able to describe in a reliable way the contribution of industrial, economic, ecological and societal activities in the complex processes of the industrial metabolism. Special attention will be paid to sustainability metrics – mainly chemometrics and environmetrics as tools for assessing of the pollution level of different ecological systems (waters, air, soil, biota). Using a big variety of case studies the role of the environmetrics for intelligent monitoring data analysis will be demonstrated and interpreted. A specific element in the data interpretation will be the use of ecotoxicity tests data in the data analysis in search of specific relationship between the different assessors of the overall pollution and toxicity in the environment.

### **Seminar Topics**

#### ***Environmental History and Sustainable Development***

Seminar 1: Changes in the environment from historical point of view and scientific and cultural responses to the changes. Case study: Garbology

Seminar 2: Scientific and technological impact on the environmental changes. Case study: The drastic environmental changes in 20th century

Seminar 3: Sustainability indicators. Ecological parameters (industrial metabolism)

Seminar 4: Sustainability indicators. Economic parameters

Seminar 5: Sustainability indicators. Social aspects

Seminar 6: Sustainability and ecological legislation

Environmetrics and chemometrics

Seminar 7: Software package STATISTICA 8.0 – basic functions and basic statistics

Seminar 8: Statistical assessment of the metrology of monitoring analytical methods

Seminar 9: Principles of the experimental design

Seminar 10: Cluster analysis – major principle and application in environmental studies (soils, water, air). Hierarchical and non-hierarchical clustering

Seminar 11: Principal components analysis - major principle and application in environmental studies (soils, water, air). Principal components regression. N-way principal components analysis

Seminar 12: Advanced environmetrics – principles of neuron nets (self-organizing maps), ranking methods, classification methods, partial least squares regression

Seminar 13: Multivariate statistics in assessment of the environmental impacts on human health

Seminar 14: Case studies for multivariate statistical assessment of modern nanomaterials

Seminar 15: Case studies for multivariate statistical assessment of plant morphology and comparison of statistical models with phenomenological measurements and DNA analysis

Presented by: Prof. Dr. Vasil Simeonov, DSc, Faculty of Chemistry and Pharmacy, University of Sofia “St. Kl. Okhridski”, Sofia, Bulgaria

e-mail: vsimeonov@chem.uni-sofia.bg

<b>Termin</b>	<b>Dzień tygodnia</b>	<b>Godzina</b>	<b>Miejsce</b>
23.04.2018	Poniedziałek	15.15 – 18.00	Minicentrum Konferencyjne (Luwr)
24.04.2018	Wtorek	15.15 – 18.00	Minicentrum Konferencyjne (Luwr)
25.04.2018	Środa	15.15 – 18.00	Minicentrum Konferencyjne (Luwr)
26.04.2018	Czwartek	15.15 – 18.00	Minicentrum Konferencyjne (Luwr)
27.04.2018	Piątek	15.15 – 18.00	Minicentrum Konferencyjne (Luwr)
07.05.2018	Poniedziałek	15.15 – 18.00	Minicentrum Konferencyjne (Luwr)
08.05.2018	Wtorek	15.15 – 18.00	Minicentrum Konferencyjne (Luwr)
09.05.2018	Środa	15.15 – 18.00	Minicentrum Konferencyjne (Luwr)
10.05.2018	Czwartek	15.15 – 18.00	Minicentrum Konferencyjne (Luwr)
11.05.2018	Piątek	15.15 – 18.00	Minicentrum Konferencyjne (Luwr)

