PROPOSAL FOR VISITING PROFESSOR POSITION 2018/2019

Course of lectures

„EXPERIMENTAL DESIGN AND INTELLIGENT DATA ANALYSIS IN ANALYTICAL, ENVIRONMENTAL AND TECHNOLOGICAL CHEMISTRY"

Duration: 15 academic hours

Seminars: 15 topics

Consultations

Totally: 60 academic hours

Lecturer: Prof. Dr. Vasil Simeonov, DSc, Faculty of Chemistry and Pharmacy, University of Sofia, Bulgaria

Term of the visit: 24.03.2019 – 13.04.2019: 25.03. – 29.03.2019 (15 hours lectures);

01.04. – 12.04.2019 (seminars and consultations)

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Abstract. Design of experiments (DoE) is well known approach (but still sparsely used) in many science fields since it makes possible to organize in a most appropriate (economic and effective) way series of consecutive experiments. The major goals of DoE could be summarized briefly as follows: assessment of the input factors on a pre-defined output function (response) of modeling of the system; optimization of the output response.

The first part of the course of lectures will present different options of constructing experimental design – factorial design (full factorial design, fractional factorial design), central – composite design, economic designs (Plackett – Burman design, mass balance design) and, further, optimization options like Box-Wilson method and Simplex optimization. Different case studies showing the application of DoE in inorganic, analytical, environmental and material chemistry will de demonstrated.

The second part of the course of lectures will give an overview of several approaches for intelligent data analysis for classification, modeling and interpretation of responses from analytical and technological experiments, monitoring of environmental systems, biological studies (omics) etc. Special attention will be given to the basic statistics approaches like correlation and regression analysis and the major multivariate statistical methods like cluster analysis (hierarchical and non-hierarchical), principal components analysis and principal components regression. Again, different case studies will support the theoretical presentation. Additionally, concepts of the sustainable development and ecological legislation will be briefly presented based on the assumption of intelligent data analysis as sustainability metrics.

Termin	Dzień tygodnia	Godzina	Miejsce
25.03.2019	poniedziałek	9.15 – 12.00 15.15 – 18.00	Minicentrum Konferencyjne (Luwr)
26.03.2019	wtorek	15.15 – 18.00	Minicentrum Konferencyjne (Luwr)
27.03.2019	środa	15.15 – 18.00	Minicentrum Konferencyjne (Luwr)
28.03.2019	czwartek	15.15 – 18.00	Minicentrum Konferencyjne (Luwr)