

Course title: **Practical environmental protection for chemical engineers**

Institute/Division: **FACULTY OF CHEMICAL ENGINEERING AND TECHNOLOGY**

Number of contact hours: **60 hours** (15 h lectures & 30 h seminar & 15 h laboratory)

Course duration: 1 semester (7th semester of regular I cycle studies - fall)

ETCS credits: **4**

Course description: The course cover the topic of environmental protection for chemical engineers, especially its practical aspect.

On the lectures the main information about actual legislation will be given, together with the most important pollutants and common industrial methods of limiting their emission to respectively: an air, water and the soil. The sewage treatment, calculation of penalties for environment pollution, etc.

The seminar will consist of the practical training with industrial partner and visits of regional company specialized in environmental protection and pollutants monitoring (especially presentation of on-line monitoring advanced systems). Also, further visits in the local waste utilization by incineration plants will be organized.

The laboratory will give practical experience in estimation of some typical pollutants, like gravimetric analysis of particular matter in flue gases, chromatographic analysis of permanent gases and selected pollutants in the air, COD (chemical oxygen demand) in waste waters, analysis of Cl ions, etc.

Education effects :

- knowledge : student will have the most up-to date knowledge in environmental protection aspects, will recognize the most important pollutants to the air, water and the soil and will know how to limit measure and these pollutants.

- skills: the students will be able to perform some typical analysis for measurement of some pollutants level in the air, water and the soil.

- social: student is able to work independently and in the group when solving the problems related to environmental protection.

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Literature: APA web-site, actual legislation shown on EU commission web-site, A.Farmer "Handbook of environmental protection and enforcement: principles and practice", Earthscan 2007

Assessment method: Final test, obligatory presence on the seminars, laboratories and the lectures, reports from the laboratories exercises and problems to solve given on the seminars.

Prerequisites: Basic course on general, inorganic and organic chemistry.

Primary target group: Students from all specialties

Lecturer: **dr hab inż. Elżbieta Skrzyńska**

Contact person: dr hab inż. Elżbieta Skrzyńska (eskrzynska@pk.edu.pl)

Remarks: The courses run regularly