Course title: **Environmental monitoring and protection**		
Programme: **Environmental Engineering**		Code: **0521**
Type of course: **Erasmus**	Course level: **I**	Semester:
Form of classes: **Lecture, laboratory**	Number of hours **30L, 30 Lab**	Creditpoints: **7 ECTS**
Education profile: **academic**		Course language: **English**
Enrolment: **yes**/ no		

GUIDE TO THE SUBJECT

I. COURSE CHART

COURSE OBJECTIVES

C.1. To relay to students knowledge on environmental monitoring.
C.2. To relay to students knowledge on rules and current possibilities of conducting monitoring studies in the environment.
C.3. To acquire a skill of methods and analysis selected monitoring data in the environmental engineering

PRELIMINARY COURSE REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. The students are expected to have background knowledge in: sources and type of environmental pollutants, chemistry and biology at level of I-st degree cycle.
2. In particular the students are expected to have basic competences in engineering calculations

LEARNING OUTCOMES

EK 1 -has a knowledge in the range of environmental monitoring programmes
EK 2 -student knows fundamentals and current possibilities of conducting environmental investigations in the environment and he understands negative industry influence on the environment
EK 3 - student is able to evaluate monitoring data as well as to estimate state of external environment processes

COURSE CONTENT

Lectures

Form of classes - lectures	Hours
Programme, structure and fundamentals of the State Environmental Monitoring Programme	4
Definition, objectives, tasks of monitoring in environmental subsystems	6
Current legislations with respect to environmental monitoring	2
The directions of studies in the environmental biomonitoring	2
Colloquium	1
Origin and types of pollutants in selected environmental elements	4
Biological processes applied in the treatment of wastewater	2
The removal of organic and biogenic pollutants from wastewater	2
Protection of polluted sediments	2
Protection of polluted soils	2
Protection of polluted air	2
Colloquium	1

Form of classes – tutorials	Hours
Computer laboratory safety training	1
Introduction to the rules of existing selected data bases and networks	2
Analysis of monitoring data coming from the selected monitoring station	7
Interpretation of results of the pollution state	3
Preparation of laboratory work report	2
Examples of environmental protection technologies	8
Group discussion on a selected topic	2
Presentation on a selected topic	4
Course summary	1

COURSE STUDY METHODS

1. interactive whiteboard
2. blackboard
3. monitoring data coming from the selected monitoring network station

METHODS OF ASSESMENT (F - formative; S - summative)

F1 – performance during the laboratory
F2 –evaluation of laboratory work and preparation of laboratory report
P1 – colloquium

STUDENT WORKLOAD

Form of activity	Workload (hours)
Participation in lectures	29 h
Participation in classes	-
Laboratory	30 h
Participation in project classes	-
Participation in seminar	-

Preparation course on e-learning **Test** **Entrance test for laboratory classes** **Project's defence** **Exam** **Consultation hours**	- 1h - - - 20h
DIRECT TEACHING, Hours/ECTS	**80 h / 3,2 ECTS**
Preparation for tutorials **Preparation for laboratories** **Preparation for projects** **Preparation for seminars** **Preparation for e-learning classes** **Participation in e-learning classes** **Working on project** **Preparation for tests** **Preparation for exam**	30 h 30 h - - - - - 35 -
SELF-STUDY, hours/ECTS	**95 h/3.8 ECTS**
TOTAL (hours)	**∑ 175 h**
TOTAL ECTS	**7 ECTS**

PRIMARY AND SUPPLEMENTARY TEXTBOOKS

Current the State Environmental Monitoring Programme
Jones A., Duck R., Reed R., Weyers J.: Environmental sciences, PWN, Warsaw 2002
Current legislations with respect to environmental monitoring with respect to the water, soil, air
Stepnowski P., Synak E., Szafranek B., Kaczyński Z.: Monitoring i analityka zanieczyszczeń w środowisku, Wydawnictwo Politechniki Gdańskiej, Gdańsk 2010
Environmental Protection, GUS, Warsaw (current)
Current environmental reports, Environmental Monitoring Library
Gajkowska-Stefańska L., Guberski S., Gutowski W., Mamak Z., Szperliński Z.: Laboratory investigations into water, wastewater and sewage sludge, Oficyna Wydawnicza Politechniki Warszawskiej, Warsaw 2001

SUBJECT COORDINATOR (NAME, SURNAME, E-MAIL ADDRESS)

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NAME OF LECTURER (s) (NAME, SURNAME, E-MAIL ADDRESS)

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Learning outcome	In relation to the learning outcomes	Course objectives	Course content	Course studymethods	Methods of assesment

	specified for the field of study				
EK 1	K_W02, K_U05	C.1	Lecture	1	P1.
EK 2	K_U02	C.2	Lecture	1	P1.
EK 3	K_U05, K_K02	C.3	Labolatory	2	F1., F2., P1.

II. OTHER USEFUL INFORMATION

1. All information on the class schedules will be posted on the information section board and on the website www.is.pcz.pl
2. The information on office course will be provided by the lecturer during the first meeting with the students as well as will be posted on the Infrastructure and Environment Faculty website
3. The information on the grade requirements will be provided to the students during the first meeting