MODULE INFORMATION SHEET

Name of Module Unit	**Environment protection**
Name in polish language	Ochrona środowiska
Module type	compulsory / ~~elective~~
Form of studying	full-time day courses
Level of study	undergraduate course (B.Sc. level)
Type of study (for extra-mural courses)	-
Programme	Environmental Engineering
Speciality	Environmental Engineering
Responsible department	Chair of Environmental Protection and Management
Responsible person	dr hab. inż. Małgorzata Loga

Semester	Lectures	Tutorials	Laboratory	Computer Exercises	Projects	ECTS
1	30					3

Objectives (summary)

Skills in: Understanding complexity of interaction of human population with natural environment via system approach; understanding natural and man-induced processes in environment; technical, legal and economic tools methods of environmental protection.

Prerequisites

Elements of physics and biology at the level of high school

Rules of integrated grade setting

1.0*Lectures grade

Recommended readings

1. I.D.White, D.N.Mottershead, S.J.Harrisopn „Environmnetal Systems", ed. Butler&Turner, Frome,Somerset, 1984
2. M.L.McKinney, R.M.Schoch "Environmnetal Science", ed. Jones and Bartlett Publ., London, 1996
3. Reddy, P. Jayarama., and CRC Press. Municipal Solid Waste Management : Processing, Energy Recovery, Global Examples. Hyderabad : Leiden: BS Publications ; CRC, 2011. Print.
4. White R. (2006). Principles and Practice of Soil Science. The Soil as a Natural Resource, Blackwell Publishing
1. https://www.pdfdrive.com/principles-and-practice-of-soil-science-the-soil-as-a-natural-resource-d175060880.html
6. Nathanson J.A., Ambulkar A., Wastewater treatment, Encyclopedia Britannica, 2020.
7. https://www.britannica.com/technology/wastewater-treatment
8. Vallero D.A., 2014: Fundamentals of Air Pollution, 5th Edition, Academic Press, San Diego
9. Seinfield J.H., Pandis S.N., 2016: Atmospheric Chemistry and Physics: from air pollution to climate change, 3rd edition, Wiley & Sons, Hoboken.

Contents of lectures (syllabus)

	Topics	Time (hrs.)	Scope (S / Ex)
1	Environment protection - definitions. Natural environment – system approach- elements and interactions.	2	S/Ex
2	Biological aspects of environment protection. Structure and functions of ecosystems. Ecological equilibrium	2	S/Ex
3	Sustainable development concept. DPSIR – model for management of environment. Introduction to Monitoring and Management of Environment.	2	S/Ex
4	Engineering aspects of soil, air and water protection. Protection of Natural resources. *Atmosphere protection* - problem of air pollution and global climate change, presenting their main driving forces, processes, phenomena and impacts. *Hydrosphere protection* – water pollution (sources and processes); eutrophication; water quality; water monitoring; flood protection; draughts; water protection methods. Groundwater pollution and protection. *Soil protection*: soil as a three-phase system. Basic physical and chemical properties of the soil, forms of soil degradation. Basics of soil remediation and land reclamation and development.	14	S/Ex
	Protection of water systems - engineering approach. Wastewater characteristic, sewerage systems, wastewater treatment and disposal. Wastewater reuse and emerging technologies	4	S/Ex
5	Renewable Energy technologies (wind and solar energy conversion), their perspectives, limitations, advantages and shortcomings.	2	Ex
6	Basic concepts and definitions related to waste management. Basic technological properties of waste and the main techniques of their processing are presented. In particular, the issues related to municipal solid waste management are discussed.	4	Ex
	Total	**30**	**hours**

S – topics listed in the legal study programme standards from 12.07.2007
Ex – extended topics

Lecturers

Dr hab. inż. Małgorzata Loga
Dr inż. Beata Karolinczak
Dr inż. Katarzyna Maciejewska
Dr hab. inż. Agnieszka Pusz
Dr inż. Grzegorz Sinicyn
Dr inż. Anna Rolewicz-Kalińska
Dr inż. Magdalena Reizer

Assessment method

Final test