

MODULE INFORMATION SHEET

Name of Module Unit	Biotechnology
Name in polish language	Biotechnologia
Module type	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	Department of Biology
Responsible person	Prof. Ewa Karwowska, D.Sc., Ph. D.

Semester	Lectures(E)	Tutorials	Laboratory	Computer Exercises	Projects	ECTS
6	15		30			3

Objectives (summary)

The main goal of the course is to acquaint students with new biotechnologies applied in decontamination of water, wastewater, soil and gases, including: bioremediation of soils from heavy metals and petroleum products, biohydrometallurgical processes, gas biofiltration, biological water treatment, biodegradation of the refractory compounds in wastewater.

Prerequisites

Biology and Ecology
Environmental Biology

Rules of integrated grade setting

Integrated grade = 0,5 * Lectures grade + 0,5 * Laboratory grade

Recommended readings

Jordening H.-J., Winter J. (red) (2005) "Environmental Biotechnology. Concepts and Applications", Wiley –VCH Verlag GmbH & Co. KGaA, Weinheim.
Liu D.H.F., Liptak B.G. (red)(1999) "Environmental Engineers' Handbook. Second Edition". Lewis Publishers, CRC Press, Boca Raton, Florida.

Contents of lectures (syllabus)

	Topics	Time (hrs.)	Scope (S / Ex)
1	Biodegradation of the refractory compounds in wastewater. Biodegradation tests.	3	Ex
2	Biofiltration of gases	2	Ex
3	Soil bioremediation polluted with petroleum products	3	Ex
4	Heavy metals removal from wastewater and wastes. Biohydrometallurgical processes	4	Ex
5	Biocorrosion and biodeterioration of materials	2	Ex
6	Achievement test – exam	1	
Total		15	hours

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

Ex – extended topics

Lecturers

Prof. Ewa Karwowska

Assessment method

Written test

Contents of laboratory

	Topics	Time (hrs.)	Scope (S / Ex)
1	Biodegradation test of chemical compounds	4	Ex
2	Waste gases biological treatment	4	Ex
3	The evaluation of the number of microorganisms in water treatment biofilm	4	Ex
4	Bioremediation of the hydrocarbons contaminated soil	6	Ex
5	Removal of heavy metals from wastewater, sludges and wastes	4	Ex
6	Biocorrosion	4	Ex
7	Achievement tests	4	Ex
Total		30	hours

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

Ex – extended topics

Persons responsible for laboratory

Adam Muszyński D. Sc., Ph.D. Eng, Associate Professor Agnieszka Tabernacka D. Sc., Ph.D. Eng, Associate Professor
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Assessment method for laboratory

Participation in laboratory, reports, two written tests
