

MODULE INFORMATION SHEET

Name of Module Unit	Biological Hazards and Biodeterioration in Environmental Engineering
Name in polish language	Zagrożenia biologiczne i korozja biologiczna w inżynierii środowiska
Module type	compulsory / elective
Form of studying	full-time day courses
Level of study	graduate course (M.Sc. level)
Type of study (for extra-mural courses)	-
Programme	Environmental Engineering
Speciality	Environment Protection Engineering
Responsible department	Department of Biology
Responsible person	Prof. dr hab. Ewa Karwowska

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

Learning outcomes (knowledge, skills, competences)

Students should know the hazards related to the contact with potentially pathogenic microflora in technological processes and the work environment, especially the sanitary-epidemiological aspects of industrial and natural disasters. He should acquire the knowledge concerning the phenomena of microbiological destruction of selected technical materials

Student should be able to analyze and describe the biological processes occurring in technical systems and within the technologies used in environmental engineering, including epidemiological aspects and phenomena of destruction of various materials as a result of microbial activity. He should be able to prepare and make the presentation on a selected issue concerning biological hazards in environmental engineering, using professional literature and applying an appropriate terminology

Student should understand the necessity of continuous development of knowledge and raising of professional qualifications and should be aware of the importance of non-technical aspects of engineering activities, including their impact on the environment and the related responsibility for decisions.

Prerequisites

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Rules for integrated grade setting

0.4 x lecture grade +0.6 x tutorial grade

Recommended readings

Kowalski W.J.: Aerobiological Engineering Handbook: A Guide to Airborne Disease Control Technologies. McGraw-Hill Professional Publishing, 2006
 Fisher M.C. et al.: Emerging fungal threats to animal, plant and ecosystem health. Nature, vol. 484, 2012

Moura M.C. et al.: An Outline to Corrosive Bacteria.
 Méndez-Vilas A. (ed). Microbial pathogens and strategies for combating them: science, technology and education. Formatex Research Center, 2013.
 Arthurson V.: Proper sanitization of sewage sludge: a critical issue for a sustainable society. Applied and Environmental Microbiology 74, 17, 2008.

Contents of lectures (syllabus)

	Topics	Time (hrs.)	Scope (S / Ex)
1	Hazards related to the storage and processing of biomass	2	Ex
2	Sanitary-epidemiological effects of floods and other natural disasters	2	Ex
3	Antibiotic resistant bacteria in wastewater treatment systems	2	Ex
4	Microorganisms as a tool of bioterrorism	2	Ex
5	Destruction of technical materials as the result of microbial activity	4	Ex
6	Microbiological disasters in industry	2	Ex
7	TEST	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

Oral test

Contents of tutorials

	Topics	Time (hrs.)	Scope (S / Ex)
1	Environmental health threats against other threats	4	Ex
2	Pathogenic microorganisms in the work environment;	6	Ex
3	Epidemiological threats and their potential risk	4	Ex
4	Waste biomass as a source of potentially pathogenic bioaerosols	2	Ex
5	Microbiological hazards related to the storage of energy biomass	2	Ex
6	Sanitary-epidemiological hazards connected with the application of sewage sludge.	4	Ex
7	Microbiological corrosion of metals and their alloys	2	Ex
8	Biodeterioration of construction and building materials	6	Ex
Total		30	hours

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

Ex – extended topics

Persons responsible for tutorials

Prof. Ewa Karwowska

Assessment method for tutorials

Self elaboration of a selected issue in the field of biological hazards in environmental engineering (in written), preparation and delivery of a multimedia presentation