



Course title: BIOTECHNOLOGY OF SOLID WASTE

ECTS credit allocation (and other scores): 1.5

Semester: spring

Level of study: ISCED-7 - second-cycle programmes (EQF-7)

Branch of science: Engineering and technology

Language: English

Number of hours per semester: 20

Course coordinator/Department and e-mail: Dr. Habil. Eng. Katarzyna Bernat, Department of Environmental Biotechnology, bernat@uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: Sources of municipal solid waste (MSW). The amounts of MSW. Morphological composition of MSW including the share of secondary waste materials. Recycling rate of secondary waste materials. Mechanical-biological treatment (MBT) of MSW. MBT with aerobic bio-stabilization of the organic fraction of municipal solid waste (OFMSW), mechanically separated from MSW. Mechanical-biological processing of the OFMSW with anaerobic bio-stabilization. The fermentation process of OFMSW in energetic piles. Models used for calculation of the amount of biogas produced during anaerobic stabilization and on the basis of the operational data.

LECTURES: Definitions of recovery and disposal of solid waste. Properties of solid waste. The development of mechanical-biological treatment (MBT) systems for the bio-stabilization of solid waste. Technical and technological solutions applied in MBT. Aerobic and anaerobic stabilization of the organic fraction of solid waste mechanically separated from mixed municipal solid waste.

Learning purpose: Upon completion of the course the students shall be able to get acquainted with the definitions, technologies and biotechnologies of disposal of municipal solid waste.

On completion of the study programme the graduate will gain:

Knowledge: Student characterizes and knows the selected unit processes, technological solutions and mechanisms used in technologies and biotechnologies of the treatment of municipal solid waste.

Skills: Student knows the definitions, technologies and biotechnologies of disposal of municipal solid waste; understands the role in these technologies and biotechnologies used in environmental protection.

Social Competencies: Student is aware of the importance of technologies to prevent environmental degradation.

Basic literature: 1) Resource, recovery and reuse in organic solid waste management, 2004, edited by Lens P., Hamelers B., Hoitink H., Bidlingmaier W., TJ International Padstow, Cornwall, UK. 2) References concerning technologies and biotechnologies of municipal solid waste treatment available on Elsevier service, 3) Materials supported by teachers.

Supplementary literature:

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 0.7

Student's independent work: 0.8