

1. Zagadnienia dyplomowe kierunku inżynieria środowiska:

1.7 Zagadnienia kierunkowe, studia drugiego stopnia, stacjonarne, zakres: Biotechnology obowiązujące od cyklu kształcenia 2022/2023.

**Wydział Geoinżynierii**  
 kierunek: **INŻYNIERIA ŚRODOWISKA**  
 zakres: **Biotechnology**  
 II stopień, studia stacjonarne  
**Zagadnienia dyplomowe kierunkowe**  
 (obowiązujące od cyklu kształcenia 2022/2023)

Student na egzaminie dyplomowym losuje 2 pytanie z puli 30 pytań.

Nr pytania	Treść pytania	Oznaczenie*
1.	"Automation pyramide" – definition and levels.	IŚ_B_II_K
2.	Programmable logic controllers – the principle of operation and an example of an application.	IŚ_B_II_K
3.	PFD (Process Flow Diagram) and P&ID (Piping/Process & Instrumentation Diagram).	IŚ_B_II_K
4.	Organizational structures of the State Environmental Monitoring.	IŚ_B_II_K
5.	Emerging inorganic and organic pollutants in the environment.	IŚ_B_II_K
6.	Pollution monitoring and its role in environmental protection.	IŚ_B_II_K
7.	Mathematical modeling in environmental engineering.	IŚ_B_II_K
8.	The types of models used during the engineering design process.	IŚ_B_II_K
9.	The advantages and disadvantages of modeling of environmental processes.	IŚ_B_II_K
10.	Dose-response relationship - theory and practical meaning.	IŚ_B_II_K
11.	Application of molecular methods to study microbial communities in engineering systems.	IŚ_B_II_K
12.	Application of polymerase chain reaction in environmental engineering.	IŚ_B_II_K
13.	Advantages and disadvantages of using biogas in cogeneration systems.	IŚ_B_II_K
14.	Methods of limiting emissions, binding and utilizing carbon dioxide.	IŚ_B_II_K
15.	Pretreatment methods for substrates in biotechnological conversion processes - the silaging process.	IŚ_B_II_K
16.	Fermentation chambers in agricultural biogas plants.	IŚ_B_II_K
17.	Technologies of using biomass for energy purposes.	IŚ_B_II_K
18.	Sectors of renewable energy conversion.	IŚ_B_II_K
19.	Advantages and disadvantages of direct generation of electricity from solar radiation.	IŚ_B_II_K
20.	Advantages and disadvantages of horizontal and vertical axis wind turbines.	IŚ_B_II_K
21.	Factors determining the energy potential of a watercourse.	IŚ_B_II_K
22.	The factors determining the separation efficiency of components of feed when processed by membrane techniques.	IŚ_B_II_K
23.	The advantages of membrane techniques application and the areas of use in environmental engineering.	IŚ_B_II_K
24.	Criteria for assessing the reliability of engineering systems.	IŚ_B_II_K
25.	Processing and management of sewage sludge on the example of a selected technology.	IŚ_B_II_K
26.	Technologies in the processing of municipal waste.	IŚ_B_II_K
27.	The use of filtration in water treatment on the example of iron and manganese removal.	IŚ_B_II_K
28.	The use of filtration in water treatment on the example of water softening.	IŚ_B_II_K
29.	Types of biomass in technical biocenoses for wastewater treatment.	IŚ_B_II_K
30.	Processes of removal of carbon, nitrogen, and phosphorus compounds from municipal wastewater on the example of a selected technological system.	IŚ_B_II_K

\*IŚ – Inżynieria środowiska, B - Biotechnology, II – studia drugiego stopnia, K – zagadnienia kierunkowe