



SZKOŁA GŁÓWNA
GOSPODARSTWA
WIEJSKIEGO

Threats and Protection Techniques of Hydrosphere

Educational subject description sheet

Basic information

Field of study Course Offer for exchange students - second cycle studies, including uniform master studies (MA programmes) Speciality - Organizational unit Course Offer for exchange students Study level second cycle studies, including uniform master studies (MA programmes) Study form full-time studies Education profile General academic		Didactic cycle 2024/25 Subject code PWMPWM2S_D.B100000P.06385.24 Lecture languages english Mandatory Elective subjects Block Basic subjects Disciplines
Coordinator	Leszek Hejduk	
Teacher	Leszek Hejduk, Agnieszka Bańkowska-Sobczak, Adam Krajewski, Agnieszka Hejduk	
Period Winter semester	Examination Pass with grade Activities and hours Lecture: 15 Laboratory exercises: 15	Number of ECTS points 4

Goals

Code	Goal
C1	Acquainting students with the threats arising from the pollution of surface water and groundwater, as well as discussing the causes of these hazards and methods for their mitigation and removal

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge - Student knows and understands:			
W1	The student knows and understands the water quality classification in the EU.		Test (written or computer based)
W2	The student knows and understands the causes of changes in the quality of river and lake waters and the sources of pollution.		Test (written or computer based)
W3	The student knows and understands methods of reducing pollution in river basin areas, with particular emphasis on non-urbanized basins		Test (written or computer based)
Skills - Student can:			
U1	The student is able to select and apply an appropriate computer model to assess the transport of pollutants from the catchment area to the river		Project
Social competences - Student is ready to:			
K1	The student is ready to work independently and in a group to solve complex problems in the field of water protection.		Project, Test (written or computer based)

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Water Quality Indicators. Surface Water Quality Classification (in Poland and European Union countries), water law, sources of water pollution; point sources (wastewater discharges, leaks), Linear sources (transportation lines, rivers, and canals), Area sources (from agricultural, industrial, urban areas, highways), Changes in river water quality, causes of pollution, erosion and sedimentation, Floodwater pollution, riverbed sediment quality, adsorption, Degradation of reservoirs, lakes, and small water bodies, changes in river water quality, Eutrophication and acidification, Standards for permissible concentrations of pollutants in wastewater, Quality of low-flow waters (base flow), river self-purification, Impact of human activities on the catchment response - both quantitative and qualitative (including floods and droughts); Impact of reservoirs, changes in lake water quality, Spread of pollutants in rivers and reservoirs, Modeling, protection of surface waters from degradation, Hydrochemical background and the nature of pollution from diffuse sources, Methods for reducing pollution from rural areas (optimal catchment usage).	W1, W2, W3, K1	Lecture
2.	Application of a selected computer model to assess pollutant transport on a catchment scale	U1, K1	Laboratory exercises

Course advanced

Activities	Methods of conducting classes
Lecture	Lecture
Laboratory exercises	Case study

Activities	Examination method	Percentage
Lecture	Test (written or computer based)	50%
Laboratory exercises	Project	50%

Activities	Credit conditions
Lecture	Passing the lecture component
Laboratory exercises	Passing the project component

Literature

Obligatory

1. Banasik k., Górski D., Ignar S., 2000. Modelowanie wezbrań opadowych i jakości odpływu z małych nieobserwowanych zlewni rolniczych. Wyd. SGGW

Optional

1. Hejduk L., Igras J. 2011. Dobre praktyki ochrony zlewni rzecznych w świetle dyrektywy azotanowej i innych standardów Unii Europejskiej. Wyd. SGGW
2. Banasik k., Oygarden L., Hejduk L. prediction nd reduction of diffuse pollution solid emission and extreme flows from rural areas. Wyd. SGGW 2011

Calculation of ECTS points

Activity form	Activity hours*
Lecture	15
Laboratory exercises	15
Preparing a report	25
Preparation for the exam	25
Self-study on the content covered in class	20
Student workload	Hours 100
Number of ECTS points	ECTS 4

* hour means 45 minutes