



JAGIELLONIAN  
UNIVERSITY  
IN KRAKÓW

## Ecosystem ecology

### Educational subject description sheet

#### Basic information

<b>Field of study</b> Environmental Protection and Management	<b>Education cycle</b> 2020/21
<b>Speciality</b> -	<b>Subject code</b> UJ.WBIEPMS.2A0.5cac67bb00c16.20
<b>Department</b> Faculty of Biology	<b>Lecture languages</b> English
<b>Study level</b> second cycle	<b>Disciplines</b> Biological sciences
<b>Study form</b> full-time degree programme	<b>ISCED classification</b> 0511 Biology
<b>Education profile</b> General academic	<b>USOS code</b>
<b>Mandatory</b> elective	
<b>Subject coordinator</b>	Ulf Bauchinger
<b>Lecturer</b>	Ulf Bauchinger

<b>Periods</b> Semester 2, Semester 4	<b>Examination</b> assessment	<b>Number of ECTS points</b> 3.0
	<b>Activities and hours</b> conversatory classes: 30, seminar: 6	

#### Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
<b>Knowledge - Student knows and understands:</b>			

W1	Students: - Understand the mechanisms of the basic ecological processes at the level of populations, communities and ecosystems; the principles of ecosystem functioning on the example of a forest ecosystem; - Know the basic methods of ecosystem survey and field measurements, collecting materials and sampling, concerning: biomass stand and production, abundances, productivity and respiration of selected groups of consumers and destruments, rates of decomposition); - Know and comprehend the most important population and ecosystem models.	EPM_K2_W01, EPM_K2_W02, EPM_K2_W03, EPM_K2_W04, EPM_K2_W09	essay, presentation
<b>Skills - Student can:</b>			
U1	Students: - Are able to estimate the energy (carbon) balance of an ecosystem; - Can employ simple mathematical models and statistical methods; - are able to search for adequate literature sources and critically select the data needed; - Can prepare a research protocol and a written study report; - Can present the results in the form of oral presentation.	EPM_K2_U01, EPM_K2_U03, EPM_K2_U04, EPM_K2_U05, EPM_K2_U06, EPM_K2_U07, EPM_K2_U09, EPM_K2_U10, EPM_K2_U11	essay, presentation
<b>Social competences - Student is ready to:</b>			
K1	Students: - Can effectively cooperate in a group; - Have a scientifically based, critical attitude to ecological issues; - Are aware of controversies in contemporary scientific ecology	EPM_K2_K01, EPM_K2_K02, EPM_K2_K06	essay, presentation

### Calculation of ECTS points

Activity form	Activity hours*	
conversatory classes	30	
seminar	6	
report preparation	20	
analysis of literature given by the teacher	10	
self-study regarding classes	19	
preparation of a multimedia presentation	5	
<b>Student workload</b>	<b>Hours</b> 90	<b>ECTS</b> 3.0
<b>Workload involving teacher</b>	<b>Hours</b> 36	<b>ECTS</b> 1.3

\* hour means 45 minutes

### Study content

No.	Course content	Subject's learning outcomes
1.	Primary production, secondary production, decomposition, ecological bioenergetics, energy and matter flow, element cycling, trophic webs, functional groups, trophic cascade in terrestrial ecosystems, community structure, biodiversity indices, quantitative methods in biodiversity analysis, biodiversity and ecosystem functioning. Energy balance in animals. Concurrent theories concerning functional effects of biodiversity. Methods of ecological field research (spatial orientation, sampling, documentation). Methods of field estimation of primary production, abundance of animal populations, modeling of ecosystem networks from field and literature data. Numerical simulation modelling. Allometry.	W1, U1, K1

## Course advanced

### Teaching methods:

text analysis, seminar, brainstorming, conversation lecture, lecture with multimedia presentation, discussion

Activities	Examination methods	Credit conditions
conversatory classes	essay, presentation	Conditions of passing the course: - accepted protocols from individual work; - delivered final written report (electronic format) and oral presentations (a Power Point file or equivalent). - Evaluation of final written report (75% of the score) - Evaluation of oral presentations (25% of the score) Grading scale (%) Grade - < 40%: 2.0 - 40 - 49.5%: 3.0 - 50 - 59.5%: 3.5 - 60 - 69.5%: 4.0 - 70 - 79.5%: 4.5 - ≥80%: 5.0
seminar	essay, presentation	

## Entry requirements

Basic course of ecology (e.g., WBNZ-472); ability to effectively use computer with Windows OS and basic software (Microsoft Office or equivalent).

## Literature

### Obligatory

1. Krebs: Ecology (2009);
2. Krebs (2012): Ecological methodology;
3. Gotelli & Ellison: Primer of ecological statistics.
4. Grodzinski, Weiner and Maycock (1984) Forest Ecosystems in Industrial Regions. (selected chapters)
5. Instructions for individual projects and additional study materials made available on the web page of the course.

## Effects

Code	Content
EPM_K2_W01	The graduate knows and understands complexity of natural phenomena and processes and their impact on nature and environment
EPM_K2_W02	The graduate knows and understands methodology of environmental sciences, especially including valorization and evaluation of environmental risks
EPM_K2_W03	The graduate knows and understands necessity to protect environment, to manage common resources and legal aspects of such activities. He/she understands mutual dependencies, risks and consequences of administrative decisions on various levels of environment functioning
EPM_K2_W04	The graduate knows and understands contemporary problems of natural environment and is able to point out new threats
EPM_K2_W09	The graduate knows and understands new trends and change directions in environment protection and in management of natural resources
EPM_K2_U01	The graduate is able to use research procedures and tools appropriate for measures of environment protection and managing natural resources
EPM_K2_U03	The graduate is able to use specialist knowledge necessary to interpret collected empirical data and to draw appropriate conclusions
EPM_K2_U04	The graduate is able to prepare public presentations related to environment and nature protection using various techniques of verbal and multimedia communication
EPM_K2_U05	The graduate is able to write a text on environment protection issues presenting his/her own research and describe the results of his/her professional evaluations and environmental analyses
EPM_K2_U06	The graduate is able to search for, select and use necessary information found in various English language sources
EPM_K2_U07	The graduate is able to plan and evaluate the condition of the environment and natural resources under the guidance of the academic supervisor and to evaluate the risks of planned actions and investments for the environment.
EPM_K2_U09	The graduate is able to communicate fluently in a foreign language, enter a debate and present issues related to his/her line of study in the field of environment sciences in accordance with the requirements set for the B+ language fluency level.
EPM_K2_U10	The graduate is able to manage the work of others, set tasks and evaluate their completion
EPM_K2_U11	The graduate is able to continuously acquire knowledge and raise his/her qualifications, inspire and help others, set and achieve career objectives
EPM_K2_K01	The graduate is able to critically appraise acquired information, use reliable and well-established sources of scientific information and draw appropriate conclusions when settling practical problems
EPM_K2_K02	The graduate is able to lead discussion and present scientific arguments related to environment protection and nature
EPM_K2_K06	The graduate is able to pursue team work while assuming different roles and also is able to plan the work in terms of sharing responsibilities and managing time