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| Module name | **Ecology** |
| Module code | B-B.012 |
| ISCED code | 0511: Biology |
| Studies cycle | Io |
| Semester | Winter or summer semester |
| Reponsible for this module | Lectures: Prof. dr hab. Bożenna Czarnecka, dr hab. Joanna Czarnecka  Laboratory: Dr hab. Piotr Sugier, dr Anna Rysiak, dr Magdalena Franczak |
| Language of instruction | English |
| Website | - |
| Prerequisites | Basic knowledge of English, basic knowledge of botany and zoology |
| ECTS | 6.5 |
| ECTS points hour equivalents | Contact hours (work with an academic teacher): 30 – lecture, 45 – labotarory, 50 – teacher individual meetings  Total number of hours with an academic teacher: 125  Number of ECTS points with an academic teacher: 5  Non-contact hours (student’s own work) – 40  Total number of non-contact hours - 40  Number of ECTS points for non-contact hours – 1.5  **Total number of ECTS points for the module: 6.5** |
| Descritpion | The lecture covers the following issues: general ecology, including the relationships among organisms and between organisms and the environment occurring at different levels of biological organization; ecological processes; matter exchange and energy balance in the biosphere. Students will also be introduced to current research problems of modern ecology and the nature of its relationship with many areas of mathematical, socio-economic, and natural sciences.  Laboratory and outdoor practice: theoretical and practical study of the following issues: types of growth forms among plants and animals, life-histories and adaptive strategies, population ecology, vegetation structure in natural and anthropogenic landscape, ecological processes at the level of plant community (succession, regression, fluctuation, regeneration, degeneration, seasonal dynamics), basic methodology of field ecological observations, designing and conducting simple observations and experiments in laboratory and natural habitats and interpretation of their results, survey of basic habitat characteristic, measurement of soil and water properties, diagnosis of the state of the environment on the basis of indicator species and plant communities, preparation and presentation of field research report. |
| Reading list | 1. Begon M., Townsend C.R. Harper J.L. 2006. Ecology. From Individuals to Ecosystems. Blackwell Publishing, Malden, USA 2. Crawley M.J. 1997. Plant Ecology. Blackwell Science, Oxford, UK 3. Falińska K. 1998. (ed.). Plant population biology and vegetation processes. Polish Acad. Sci., W. Szafer Inst. Botany, Kraków 4. Silvertown J.W., Lovett Doust J. 1993. Introduction to plant population biology. 3rd ed. Blackwell Sci., Oxford |
| Educational outcomes | **KNOWLEDGE**   1. Recognition and description of basic ecological processes at different levels of living matter organization (individual, population, community, ecosystem) 2. Recognition and characteristics of processes at different levels of living matter organization 3. Knowledge of interactions between growth form, life-history traits and the environmental conditions 4. Knowledge of spatial and temporal patterns, adaptive strategies and evolutionary trade-offs among organisms in variable and changeable environment   **SKILLS**   1. Ability to link the growth form type with different features of environment 2. Recognition of basic units of vegetation 3. Recognition and understanding of different ecological processes at the level of community of organisms 4. Diagnosis of the state of the environment on the basis of indicator species and plant communities 5. Exploration and using information from various sources   **ATTITUDES**   1. Perceiving interactions among different organisms in their natural environment 2. Awareness of the position and role of plants and animals and organismal communities in functioning of ecosystems |
| Assessment methods and criteria | Lecture: Test exam composed of different forms of questions (true/false, multiple choice, short answer)  Laboratory: written test and field research report |
| Teaching methods | Lecture, discussion, individual projects, laboratory experiments performed by groups of students, environmental observation, surveys, student reports by individuals |
| Educational outcomes verification methods | Discussion, oral presentation written test |
| Comments | Part of the course is conducted in form of field survey |

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| **Type of classes** | Lecture |
| Reading list | 1. Begon M., Townsend C.R. Harper J.L. 2006. Ecology. From Individuals to Ecosystems. Blackwell Publishing, Malden, USA 2. Crawley M.J. 1997. Plant Ecology. Blackwell Science, Oxford, UK 3. Falińska K. 1998. (ed.). Plant population biology and vegetation processes. Polish Acad. Sci., W. Szafer Inst. Botany, Kraków 4. Silvertown J.W., Lovett Doust J. 1993. Introduction to plant population biology. 3rd ed. Blackwell Sci., Oxford |
| Educational outcomes | **KNOWLEDGE**   1. Recognition and description of basic ecological processes at different levels of living matter organization (individual, population, community, ecosystem) 2. Recognition and characteristics of processes at different levels of living matter organization 3. Knowledge of interactions between growth form, life-history traits and the environmental conditions 4. Knowledge of spatial and temporal patterns, adaptive strategies and evolutionary trade-offs among organisms in variable and changeable environment   **SKILLS**   1. Ability to link the growth form type with different features of environment 2. Recognition of basic units of vegetation 3. Recognition and understanding of different ecological processes at the level of community of organisms 4. Diagnosis of the state of the environment on the basis of indicator species and plant communities 5. Exploration and using information from various sources   **ATTITUDES**   1. Perceiving interactions among different organisms in their natural environment 2. Awareness of the position and role of plants and animals and organismal communities in functioning of ecosystems |
| Assessment methods | Test exam composed of different forms of questions (true/false, multiple choice, short answer) |
| A list of topics | 1. Ecology – definition and scope 2. Biological hierarchy – levels of biological organization 3. Organism – ecological meaning of the individual 4. Organism and its environment 5. Life-history, life history traits, life strategies 6. Plant-animal interactions 7. Basics of biogeography 8. Population ecology 9. Biocoenosis 10. Ecosystem structure and functioning 11. Vegetation structure in natural and anthropogenic landscapes |
| Teaching methods | Lecture, discussion |

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| **Type of classes** | Laboratory with outdoor practice |
| Reading list | 1. Begon M., Townsend C.R. Harper J.L. 2006. Ecology. From Individuals to Ecosystems. Blackwell Publishing, Malden, USA 2. Crawley M.J. 1997. Plant Ecology. Blackwell Science, Oxford, UK 3. Falińska K. 1998. (ed.). Plant population biology and vegetation processes. Polish Acad. Sci., W. Szafer Inst. Botany, Kraków 4. Silvertown J.W., Lovett Doust J. 1993. Introduction to plant population biology. 3rd ed. Blackwell Sci., Oxford |
| Educational outcomes | **KNOWLEDGE**   1. Identification and description of ecological processes concerning organisms, populations, communities and ecosystems 2. Knowledge of major methods of surveys of habitat conditions, populations, communities and ecosystems 3. Knowledge of main sources of information about organisms at individual, populational and community level 4. Understanding and characteristics of human influence on various ecosystems   **SKILLS**   1. Planning and conducting simple field and laboratory observations of organisms, populations and communities and interpretation of their results 2. Selection of proper methods of observations and data analysis for the specific aim of the study 3. Application of simple statistical methods and computer programs for data analysis 4. Presentation of obtained results, conclusions formulating 5. Analyses of the relationship between human activity and the environmental condition   **ATTITUDES**   1. Ability to plan scientific surveys and to analyze critically obtained results 2. Taking care of proper conduction of observations and solid data analysis |
| Assessment methods | Written test and field research report |
| A list of topics | 1. Traits of terrestrial and aquatic environments. The acidity of the soil and water. Determination of calcium carbonate in soil and water 2. Alien and invasive species in global, national and regional scale 3. The structure and organization of the population 4. The role of the seeds in the population dynamics 5. Organisms and the environment. Ecological groups and life strategies (outdoor practice) 6. Selected field research methods at the population and ecosystem levels (outdoor practice) 7. Specificity of lakes and peatlands of the Polesie Lubelskie Region (outdoor practice in Poleski National Park. Western Polesie Biosphere Reserve) 8. Forest vegetation and river valleys of Central Roztocze (outdoor practice in Roztoczański National Park, Czartowe Nature Pole Reserve) 9. Landscape value and biodiversity of Kazimierski Landscape Park (outdoor practice in interesting habitats in the vicinity of Lublin) |
| Teaching methods | Individual projects, laboratory experiments performed by groups of students, environmental observation, surveys, student reports by individuals |