

1.	<b>Course name: Advanced techniques in plant developmental research</b>
2.	<b>Course code conforms to USOS: 25-BI-S1-E+-ATPDR</b>
3.	University department: Faculty of Biological Sciences, Institute of Experimental Biology, Department of Plant Developmental Biology, Kanonia 6/8 Street, 50-328 Wrocław
4.	Course type: seminars (30 h)
5.	Degree: <b>bachelor</b>
6.	Semester: <b>summer</b>
7.	Number of hours: <b>30</b>
8.	Name, Surname, academic title: <b>Alicja Dołzblasz, PhD</b> (alicja.dolzblasz@uwr.edu.pl)
9.	<b>Course description/Content:</b> <i>Arabidopsis thaliana</i> as a plant model system; genetic regulation of the shoot/root meristems maintenance and embryo development; e.g. <i>WOX</i> , <i>CLV</i> , <i>AGO</i> and <i>ARR</i> genes (the selected regulatory networks may vary from year to year); various experimental techniques. During the course students have to read selected research articles, from the plant developmental biology field, and to discuss, in English, about their content. Students learn about various experimental techniques, have to be fluent in English and possess a basic knowledge of plant developmental biology.
10.	Recommended literature: The publications containing the latest science news, scientific breakthroughs and discoveries from the plant developmental research. English dictionaries.
11.	Form of credit: Presentation, evaluation of the student's activity, writing test
12.	Language: English
13.	Number of ECTS: <b>4</b>

1.	<b>Course name: Basic Modeling in Ecology with R</b>
2.	<b>Course code conforms to USOS: 25-BI-S2-E+-BMER</b>
3.	University department: Faculty of Biological Sciences, Institute of Environmental Biology, Laboratory of Forest Biology, Sienkiewicza 21 Street, 50-335 Wrocław
4.	Course type: practices
5.	Degree: <b>master</b>
6.	Semester: <b>winter</b>
7.	Number of hours: <b>30</b>
8.	Name, Surname, academic title: <b>Grzegorz Neubauer, PhD</b> (grzegorz.neubauer@uwr.edu.pl)
9.	<b>Course description/Content:</b> Ecological data types. Introduction to R and model fitting in R. Basic graphics in R. Random variables. Linear Models. Distributions of the response variable and Generalized Linear Models. Additive Linear Models. Random Effects and Mixed Effects Models. Hierarchical models: use and applications. State and rate parameters. Data simulation and model validation.
10.	Recommended literature:

	Zuur et al. 2007. Analysing Ecological Data. Springer: New York. Zuur et al. 2009. Mixed Effects Models and Extensions in R. Springer: New York.
11.	Form of credit: writing test
12.	Language: English
13.	Number of ECTS: <b>4</b>

1.	<b>Course name: Basic Palaeontology I</b>
2.	<b>Course code conforms to USOS: 25-BI-S2-E+-BP1</b>
3.	University department: Faculty of Biological Sciences, Institute of Environmental Biology, Department of Paleozoology, H. Sienkiewicza 21 Street, 50-335 Wrocław
4.	Course type: lecture (60 hours) and field courses (60 hours)
5.	Degree: <b>bachelor/master</b>
6.	Semester: <b>winter</b>
7.	Number of hours: <b>120</b>
8.	Name, Surname, academic title: <b>Adrian Marciszak, PhD</b> (adrian.marciszak@uwr.edu.pl)
9.	<b>Course description/Content:</b> Palaeontology as a science and geological time scale. Fossils in time and space. Macroevolution. The origin of life. Early metazoans. Radialians 1: cnidarians and lophophorates. Radialians 2: echinoderms and hemichordates. Spiralians: arthropods and molluscs. Invertebrates. Vertebrates. Microfossils. Macrofossils. Trace fossils. Major diversifications and extinctions. Human relations with environment and animals.
10.	Recommended literature: Benton M.J. and Harper D.A.T. 1997. Basic palaeontology. Pearson Education. Dixon D., Benton M. J., Kingslay A., Baker J. 2001. Atlas of life on Earth. Barnes & Noble. Benton M. J. 2008. The History of Life. A very Short Introduction. Oxford University Press. Cowen R. 2013. History of Life. John Wiley & Sons. Kurtén B. 1968. Pleistocene mammals of Europe. Weidenfeld and Nicolson, London.
11.	Form of credit: exam
12.	Language: English
13.	Number of ECTS: <b>12</b>

1.	<b>Course name: Basic Palaeontology II</b>
2.	<b>Course code conforms to USOS: 25-BI-S2-E+-BP2</b>
3.	University department: Faculty of Biological Sciences, Institute of Environmental Biology, Department of Paleozoology, H. Sienkiewicza 21 Street, 50-335 Wrocław
4.	Course type: field practices (60 hours of field course in summer, June-August)
5.	Degree: <b>bachelor/master</b>

6.	Semester: <b>summer</b>
7.	Number of hours: <b>60</b>
8.	Name, Surname, academic title: <b>Adrian Marciszak, PhD</b> (adrian.marciszak@uwr.edu.pl)
9.	<b>Course description/Content:</b> Participation in summer excavation campaign. Cave excavations, sediments washing. Preparation of fossil material. Conservation and field classification. Palaeontological field excursions as lessons in terrain. Macropaleontological and micropaleontological methodology. Looking for fossils.
10.	Recommended literature: Benton M.J. and Harper D.A.T. 1997. Basic palaeontology. Pearson Education. Dixon D., Benton M. J., Kingslay A., Baker J. 2001. Atlas of life on Earth. Barnes & Noble. Benton M. J. 2008. The History of Life. A very Short Introduction. Oxford University Press. Cowen R. 2013. History of Life. John Wiley & Sons. Kurtén B. 1968. Pleistocene mammals of Europe. Weidenfeld and Nicolson, London.
11.	Form of credit: credit for presence
12.	Language: English
13.	Number of ECTS: <b>6</b>

1.	<b>Course name: Bioinformatic tools for gene identification and protein analysis</b>
2.	<b>Course code conforms to USOS: 25-BI-S1-E+BTGIPA</b>
3.	University department: Faculty of Biological Sciences, Institute of Experimental Biology, Department of Molecular Plant Physiology, Kanonia 6/8 Street, 50-328 Wrocław
4.	Course type: seminar and project (30 h)
5.	Degree: <b>bachelor/master</b>
6.	Semester: <b>summer</b>
7.	Number of hours: <b>30</b>
8.	Name, Surname, academic title: <b>Magdalena Migocka, PhD</b> (magdalena.migocka@uwr.edu.pl)
9.	<b>Course description/Content:</b> Gene, genome and protein databases (GeneBank, TAIR, TIGR, PlantGDB, Phytozome), sequencing projects, bioinformatic tools for gene, promoters and protein identification and analysis (BLASTn and BLASTp, GeneMark, SoftBerry, ClustalW, TargetP, TreeLoc3.0, PlantCARE, HMMTop, CCTOP). Identification of genes and promoters in the plant genomes. Phylogenetic analysis of the newly identified proteins.
10.	Recommended literature: Publications from the NCBI database. Genomic and proteomic databases.
11.	Form of credit: Report prepared based on the data obtained during seminar
12.	Language: English
13.	Number of ECTS: <b>6</b>

1.	Course name: <b>Biology of plants</b>
2.	<b>Course code conforms to USOS: 25-BI-S1-E+-BP</b>
3.	University department: Faculty of Biological Sciences, Institute of Experimental Biology, Department of Plant Developmental Biology, Kanonia 6/8 Street, 50-328 Wrocław
4.	Course type: seminars (15 h)
5.	Degree: <b>bachelor</b>
6.	Semester: summer
7.	Number of hours: <b>15</b>
8.	Name, Surname, academic title: <b>Beata Zagórka-Marek, Professor</b> (beata.zagorska-marek@uwr.edu.pl)
9.	Course description/Content: an attractive and changeable selection of updated, most interesting topics in plant science: difficulty in defining a plant (prokaryotic plants?); plant sex regulation –hermaphroditic flowers and transsexual gametophytes; plant's neurobiology – highways in plant tissues; amphibian plants - genetic regulation of phenotypic plasticity; singing plants -biological rhythms and clocks; immortality of plant stem cells – virtues and challenges; molecular cross-talks between plants and microorganisms; the Red Queen effect - plant's chemical weapons and specific metabolites (indigo dye); horizontal gene transfer – genomic acquisitions from animals; unique ways of speciation – plant hybrids and chimeras; living crystals-virtual plants in computer modeling. New discoveries - living fossils (Wollemi pine, Amborella, Ceratophyllum, Psilotum); Archaeostella, Archaeanthus –oldest fossil flowers; corn ancestor (teosinte). Guest topic: predaceous fungi – how to trap a mobile animal.
10.	Recommended literature:  Evert RF, Eichorn SE. (2013). Raven Biology of Plants, 8-th edition, Freeman & Co. Baluška F., Mancuso S. (2006). Communication in plants: neuronal aspects of plant life. Blackwell Publishing. Coen E. (1999) The Art of Genes.How Organisms Make Themselves. Oxford University Press. Oxford, New York. Howell S.H. (2000). Molecular Genetics of Plant Development. Cambridge University Press. Cambridge, New York. Leyser O., Day S. (2003). Mechanisms in Plant Development. Blackwell Publishing Ltd. Turnbull C.G.N. (Ed.). (2005). Plant Architecture and its Manipulations. Annual Plant Reviews. V. 17. Blackwell Publishing Ltd. CRC Press.  Original articles recommended by the lecturer
11.	Form of credit: assessment of a short conversation or written description of the topic freely selected by the student
12.	Language: English
13.	Number of ECTS: <b>2</b>

1.	<b>Course name: Biology</b>
2.	<b>Course code conforms to USOS: 25-BI-S1-E+-B</b>
3.	University department: Faculty of Biological Sciences, Institute of Experimental Biology, Department of Animal Developmental Biology (H. Sienkiewicza 21 Street, 50-335 Wrocław), Department of Plant Developmental Biology (Kanonia 6/8 Street, 50-328 Wrocław)
4.	Course type: lectures (30 h) and laboratory (30 h)
5.	Degree: <b>bachelor</b>
6.	Semester: <b>winter</b>
7.	Number of hours: <b>60</b>
8.	Name, Surname, academic title:  Botanical part: <b>Alicja Dołzbłasz, PhD</b> (alicja.dolzbłasz@uwr.edu.pl) <b>Edyta Gola, PhD</b> (edyta.gola@uwr.edu.pl) <b>Elżbieta Myśkow, PhD</b> (elzbieta.myskow@uwr.edu.pl) <b>Katarzyna Sokółowska, PhD</b> (katarzyna.sokolowska@uwr.edu.pl) <b>Paulina Tomaszewska, PhD</b> (paulina.tomaszewska@uwr.edu.pl)  Zoological part: <b>Izabela Jędrzejowska, PhD</b> (izabela.jedrzejowska@uwr.edu.pl) <b>Magda Dubińska-Magiera, PhD</b> (magda.dubinska-magiera@uwr.edu.pl) <b>Marta Migocka-Patrzałek, PhD</b> (marta.migocka-patrzalek@uwr.edu.pl)
9.	<b>Course description/Content:</b> Plant structure (organs, tissues), methods used in the plant cell biology, structures and compartments specific to plant cell, cell cycle; characteristics of the ecological plant groups, selected issues on the plant taxonomy and systematics; plant cell evolution; primary and secondary plant architecture; phenotyping; chosen aspects of the plant developmental biology and plant biotechnology.  Animal cells: nucleus, cytoplasmic structures, cell divisions. Animal tissues: epithelial, connective, muscle and nervous.
10.	Recommended literature: Selected articles and chapters from the following books: Alberts et al.. "Molecular biology of the cell", 1994, 2005-2009, Garland Publishing; P. H. Raven et al. "Biology of plants", 2005, Freeman and Company Publishers.  M.H. Ross, W. Pawlina: Histology-a text and atlas with correlated cell and molecular biology, pp. 98-341
11.	Form of credit: Lecture: written test Laboratory: written test and evaluation of the student's work in the lab, practical identification of histological sections
12.	Language: English
13.	Number of ECTS: <b>4</b>

1.	<b>Course name: Bionanotechnologies</b>
2.	<b>Course code conforms to USOS: 25-BI-S2-E+-BN</b>
3.	University department: Faculty of Biological Sciences, Institute of Genetics and Microbiology, Department of Pathogen Biology and Immunology, S. Przybyszewskiego 63/77 Street, 51-148 Wrocław
4.	Course type: lectures (10 h) and seminar (10 h)
5.	Degree: <b>master</b>
6.	Semester: <b>summer</b>
7.	Number of hours: <b>20</b>
8.	Name, Surname, academic title: <b>Anna Kędziora, PhD</b> (anna.kedziora@uwr.edu.pl)
9.	<b>Course description/Content:</b> History of bionanotechnology. Aim of nanotechnology. Impact of nanoscience in biology and medicine development. Application of nanoproducts in the industry. Positive and negative aspects of nanomaterials usage. Hopes and fears of nanoproducts application.
10.	Recommended literature: Tuan Vo-Dinh, Nanotechnology in biology and medicine, Taylor&Francis Group 2006 Research articles and reviews recommended by the lecturer.
11.	Form of credit: Lecture: writing test Seminar: presentation
12.	Language: English
13.	Number of ECTS: <b>2</b>

1.	<b>Course name: Conservation biology</b>
2.	<b>Course code conforms to USOS: 25-BI-S1-E+CB</b>
3.	University department: Faculty of Biological Sciences, Institute of Environmental Biology, Department of Invertebrate Biology, Evolution and Conservation, S. Przybyszewskiego 65 Street, 51-148 Wrocław
4.	Course type: lectures
5.	Degree: <b>bachelor</b>
6.	Semester: <b>winter</b>
7.	Number of hours: <b>30</b>
8.	Name, Surname, academic title: <b>Kadej Marcin, Ph.D</b> , assistant professor (marcin.kadej@uwr.edu.pl)
9.	<b>Course description/Content:</b> The course covers biological diversity, landscape ecology, threat factors, conservation strategies and practical conservation work. It also includes some references to the following topics: global extinction patterns, consequences of small population size, species invasions, habitat and population fragmentation and conservation planning. The course contains: - A theoretical part with lectures of relevant parts of the course literature

	<ul style="list-style-type: none"> <li>- Discussion seminars on part of the course literature and scientific papers</li> <li>- A presentation (PowerPoint) about selected conservation's problems</li> <li>- A visit in ZOO of Wrocław where the role of zoological gardens in protection of endangered species is described and discussed</li> </ul>
10.	<p>Recommended literature:</p> <p>Sodhi &amp; Ehrlich (eds.) Conservation Biology for All, Oxford University Press 2010 (selected chapters)</p> <p>Andrew S. Pullin. Conservation Biology, Cambridge University Press, 2002 (selected chapters)</p>
11.	<p>Form of credit:</p> <p>Lectures: PowerPoint presentation (20 minutes) and multiple-choice test (20 questions)</p>
12.	Language: English
13.	Number of ECTS: <b>4</b>

1.	<b>Course name: English language in biology</b>
2.	<b>Course code conforms to USOS: 25-BI-S1-E+-ELB</b>
3.	University department: Faculty of Biological Sciences, Institute of Experimental Biology, Department of Plant Developmental Biology, Kanonia 6/8 Street, 50-328 Wrocław
4.	Course type: seminars (20 h)
5.	Degree: <b>bachelor</b>
6.	Semester: <b>winter</b>
7.	Number of hours: <b>20</b>
8.	Name, Surname, academic title: <b>Alicja Dołzblasz, PhD</b> (alicja.dolzblasz@uwr.edu.pl)
9.	<b>Course description/Content:</b> Understanding and explaining of the common English biological terms from plant and animal biology, microbiology, experimental and environmental biology.
10.	<p>Recommended literature:</p> <p>English-polish dictionaries.</p> <p>Stephen Gould: Ever Since Darwin, Panda's Thumb, Leonardo's Mountain of Clams and the Diet of Worms, Wonderful Life: Burgess Shale and the Nature of History.</p> <p>Bryson B. 2003. A Short History of Nearly Everything.</p> <p>Raven P., Evert R., Eichhorn S. Biology of Plants. 7-th Edition.</p> <p>Wilson E. 1999. The Diversity of Life. 2 Edition.</p> <p>Margulis L., Sagan D. Acquiring Genomes A Theory of the Origins of Species.</p> <p>Margulis L., Sagan D. What is Life.</p>
11.	<p>Form of credit:</p> <p>Presentation, evaluation of the student's activity,</p>
12.	Language: English
13.	Number of ECTS: <b>3</b>

1.	<b>Course name: Environmental biology</b>
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2.	<b>Course code conforms to USOS: 25-BI-S1-E+-EB</b>
3.	University department: Faculty of Biological Sciences, Institute of Environmental Biology, Department of Invertebrate Biology, Evolution and Conservation, S. Przybyszewskiego 65 Street, 51-148 Wrocław
4.	Course type: lectures (20 h) and field courses (10 h)
5.	Degree: <b>bachelor</b>
6.	Semester: <b>winter</b>
7.	Number of hours: <b>30</b>
8.	Name, Surname, academic title; <b>Kadej Marcin, Ph.D</b> , assistant professor (marcin.kadej@uwr.edu.pl)
9.	<b>Course description/Content:</b> The program consists of the courses focusing on various aspects of Environmental biology. It explores the fundamentals of ecology and their relevance to human impact on natural systems. This includes ecosystem structure and function, population dynamics, human impacts on the earth's natural resources. The course contains: - A theoretical part with lectures of relevant parts of the course literature - Discussion seminars on part of the course literature and scientific papers - A presentation (PowerPoint) presenting some aspects of environmental biology - visit to the Natural History Museum
10.	Recommended literature: Hilleman T. B. 2009. Environmental Biology, ISBN 9781578085767
11.	Form of credit: Lectures: PowerPoint presentation (20 minutes) and multiple-choice test (20 questions)
12.	Language: English
13.	Number of ECTS: <b>4</b>

1.	<b>Course name: Forest Ecology</b>
2.	<b>Course code conforms to USOS: 25-BI-S2-E+-FE</b>
3.	University department: Faculty of Biological Science, Department of Ecology, Biogeochemistry and Environmental Protection, Kanonia 6/8 Street, 50-328 Wrocław
4.	Course type: lectures
5.	Degree: <b>master</b>
6.	Semester: <b>summer</b>
7.	Number of hours: <b>15</b>
8.	Name, Surname, academic title; <b>Tomasz Szymura, Ph.D</b> , assistant professor (tomasz.szymura@uwr.edu.pl)
9.	<b>Course description/Content:</b> the program focus on principles of ecology and management of forest ecosystems in the temperate climatic zone, including ecology and biology of some tree species. The forest management is considered regarding its influence on biodiversity. Lecture topics: the specific of the forest ecosystem and ecosystem services provided by forests; the climate of the forest; spontaneous dynamics of natural forest; ecology of central European tree species; principles of forest management, the basic forestry practices and its impact on ecosystems.
10.	Recommended literature: selected papers and/or chapters given by teacher
11.	Form of credit: test (different kind of questions: multiple choice, completion, written



	answers)
12.	Language: English
13.	Number of ECTS: <b>2</b>

1.	<b>Course name: History of European teriofauna</b>
2.	<b>Course code conforms to USOS: 25-BI-S2-E+-HTE</b>
3.	University department: Faculty of Biological Sciences, Institute of Environmental Biology, Department of Paleozoology, H. Sienkiewicza 21 Street, 50-335 Wrocław
4.	Course type: lecture/practices
5.	Degree: <b>master</b>
6.	Semester: <b>winter</b>
7.	Number of hours: <b>60</b> (30 + 30)
8.	Name, Surname, academic title: <b>Adrian Marciszak, PhD</b> (adrian.marciszak@uwr.edu.pl)
9.	<b>Course description/Content:</b> Changes in teriofauna in time and space. Macroevolution. The origin of European species. Migrations and evolution events. Morphological adaptations of mammals to environmental changes. Refugee. Evolution lineages and key species. Human relations with environment and animals. Biochronology and paleoecology. Extinction in micro- and macroscale. Species determination. Course of anatomy and adaptive morphology.
10.	Recommended literature: Kurtén B. 1968. Pleistocene mammals of Europe. Weidenfeld and Nicolson, London. Niethammer J., Krapp F. 1993.: Handbuch der Säugetiere Europas. AULA-Verlag, Wiesbaden. Wilson D. E., Reeder D. M. 2005. Mammal Species of the World. A taxonomic and geographic reference. Johns Hopkins University Press, Washington.
11.	Form of credit: exam
12.	Language: English
13.	Number of ECTS: <b>6</b>

1.	<b>Course name: Infectious parasitic diseases</b>
2.	<b>Course code conforms to USOS: 25-BI-S2-E+-IPD</b>
3.	University department: Faculty of Biological Sciences, Institute of Genetics and Microbiology, Department of Parasitology, S. Przybyszewskiego 63/77 Street, 51-148 Wrocław
4.	Course type: lectures (10 h) and laboratory (20 h)
5.	Degree: <b>master</b>
6.	Semester: <b>winter</b>
7.	Number of hours: <b>30</b>
8.	Name, Surname, academic title: <b>Agnieszka Percec-Matysiak, PhD</b> (agnieszka.perec-matysiak@uwr.edu.pl)

	<b>Joanna Hildebrand, PhD</b> (joanna.hildebrand@uwr.edu.pl)
9.	<b>Course description/Content:</b> Introduction to the most important human parasitic pathogens and diagnostic methods as well as prevention and control of parasitic diseases. General and medical parasitology, opportunistic parasites. Vectorborne, foodborne and waterborne parasitic diseases. Selected diagnostic methods used in parasitology.
10.	Recommended literature: Foundations of Parasitology, 8 <sup>th</sup> Edition, McGraw&Hill Higher Education (selected chapters) Human Parasitology, 3 <sup>rd</sup> Edition, Elsevier (selected chapters) Brock Biology of Microorganisms. 13th Edition. Pearson Benjamin Cummings (selected chapters)
11.	Form of credit: Lecture: test, written exam Laboratory: test and lab skills
12.	Language: English
13.	Number of ECTS: <b>4</b>

1.	<b>Course name: Human microbiota</b>
2.	<b>Course code conforms to USOS: 25-BI-S1-E+-HM</b>
3.	University department: Faculty of Biological Sciences, Institute of Genetics and Microbiology, Department of Pathogen Biology and Immunology, S. Przybyszewskiego 63/77 Street, 51-148 Wrocław
4.	Course type: lectures (15 h) and laboratory (30 h)
5.	Degree: <b>bachelor</b>
6.	Semester: <b>winter</b>
7.	Number of hours: <b>45</b>
8.	Name, Surname, academic title: <b>Agata Dorotkiewicz-Jach, PhD</b> (agata.dorotkiewicz-jach@uwr.edu.pl)
9.	<b>Course description/Content:</b> The identification, taxonomy and inventory of the human microbiota. Understanding the cellular and molecular mechanisms used by bacterial pathogens to colonize their human host.
10.	Recommended literature: Microbiology. Tortora, Funke, Case. Pearson Education 2000 (selected chapters)
11.	Form of credit: Lecture: writing test Laboratory: student's activity, writing tests
12.	Language: English
13.	Number of ECTS: <b>4</b>

1.	<b>Course name: Landscape Ecology</b>
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2.	<b>Course code conforms to USOS: 25-BI-S2-E+-LE</b>
3.	University department: Department of Ecology, Biogeochemistry and Environmental Protection, Faculty of Biological Science, Kanonia 6/8, 50-328 Wrocław
4.	Course type: lectures
5.	Degree: <b>master</b>
6.	Semester: <b>summer</b>
7.	Number of hours: <b>15</b>
8.	Name, Surname, academic title; <b>Tomasz Szymura, Ph.D</b> , assistant professor (tomasz.szymura@uwr.edu.pl)
9.	<b>Course description/Content:</b> the program focus on theoretical principles of landscape ecology and practical application of landscape ecology in context of central European nature conservation. Lecture topics: landscape as a study topic in ecology and nature conservation; the biogeographical island theory and the conception of patches and corridors; analysis of the landscape structure; landscape fragmentation, landscape permeability and its consequences to nature conservation; typology of landscapes of the Europe
10.	Recommended literature: selected papers and/or chapters given by teacher
11.	Form of credit: test (different kind of questions: multiple choice, completion, written answers )
12.	Language: English
13.	Number of ECTS: <b>2</b>

1.	<b>Course name: Management of natural environment</b>
2.	<b>Course code conforms to USOS: 25-BI-S2-E+-MNE</b>
3.	University department: Faculty of Biological Sciences, Institute of Environmental Biology, Department of Invertebrate Biology, Evolution and Conservation, S. Przybyszewskiego 65 Street, 51-148 Wrocław
4.	Course type: lectures (10 h) and field courses (20 h)
5.	Degree: <b>master</b>
6.	Semester: <b>summer</b>
7.	Number of hours: <b>30</b>
8.	Name, Surname, academic title; <b>Kadej Marcin, Ph.D</b> , assistant professor (marcin.kadej@uwr.edu.pl)
9.	<b>Course description/Content:</b> The programme consists of the courses focusing on various aspects of natural resources theory, assessment and protection (especially animals and their habitats) combined with courses dealing with various aspects of natural resources management and environment. The course contains: - A theoretical part with lectures of relevant parts of the course literature - Discussion seminars on part of the course literature and scientific papers - A presentation (PowerPoint) presenting some aspects of natural environment management - field visits to selected Natura 2000 sites (near Wrocław) showing practical forms of management
10.	Recommended literature: selected papers and/or chapters given by teacher
11.	Form of credit: PowerPoint presentation (20 minutes), short essay on one of the

	selected topics and multiple-choice test (20 questions)
12.	Language: English
13.	Number of ECTS: <b>4</b>

1.	<b>Course name: Medical microbiology</b>
2.	<b>Course code conforms to USOS: 25-BI-S2-E+-MM</b>
3.	University department: Faculty of Biological Sciences, Institute of Genetics and Microbiology, Department of Pathogen Biology and Immunology, S. Przybyszewskiego 63/77 Street, 51-148 Wrocław
4.	Course type: lectures (15 h) and laboratory (30 h)
5.	Degree: <b>master</b>
6.	Semester: <b>winter</b>
7.	Number of hours: <b>45</b>
8.	Name, Surname, academic title: <b>Zuzanna Drulis-Kawa, Professor</b> (zuzanna.drulis-kawa@uwr.edu.pl)
9.	<b>Course description/Content:</b> Introduction to the most important human pathogens and methods used in laboratory diagnosis. Clinical diagnostics, bacterial virulence factors, taxonomy and overview of the major human bacterial pathogens, antibiotics and mechanisms of bacterial resistance to antibiotics.
10.	Recommended literature: Brock Biology of Microorganisms. Twelfth Edition. Pearson Benjamin Cummings. 2009 (selected chapters) Bacterial Infections of Humans, Epidemiology and Control, Fourth Edition, Brachman & Abrutyn, Springer 2009 (selected chapters)
11.	Form of credit: Lecture: test, written exam Laboratory: written paper, a practical test
12.	Language: English
13.	Number of ECTS: <b>4</b>

1.	<b>Course name: Methods in plant molecular biology</b>
2.	<b>Course code conforms to USOS: 25-BI-S1-E+-MPMB</b>
3.	University department: Faculty of Biological Sciences, Institute of Experimental Biology, Department of Molecular Plant Physiology, Kanonia 6/8 Street, 50-328 Wrocław
4.	Course type: laboratory (45 h)
5.	Degree: <b>bachelor</b>
6.	Semester: <b>winter</b>
7.	Number of hours: <b>45</b>
8.	Name, Surname, academic title:

	<b>Magdalena Migocka, PhD</b> (magdalena.migocka@uwr.edu.pl)
9.	<b>Course description/Content:</b> DNA and RNA isolation from plant tissues. DNA and RNA electrophoresis. cDNA synthesis - reverse transcription. Reverse transcriptases. PCR on the cDNA and DNA templates. Gene expression analysis. Reference genes. Plasmids used for transformation of bacteria, yeast and plants. Transformation of bacteria and yeast cells with plasmids carrying different plant genes. Preparation of plasmids from bacterial cells. Microscopic observation of the yeast expressing plant genes.
10.	Recommended literature: Basic Methods In Molecular Biology L. Davis, M. Kuehl, J. Battey, McGraw-Hill Professional; 2nd edition, 1995;
11.	Form of credit: Written test
12.	Language: English
13.	Number of ECTS: <b>5</b>

1.	<b>Course name: New vistas in experimental biology</b>
2.	<b>Course code conforms to USOS: 25-BI-S2-S3-E+-NVEB</b>
3.	University department: Faculty of Biological Sciences, Institute of Experimental Biology, Department of Plant Developmental Biology (Kanonia 6/8 Street, 50-328 Wrocław)
4.	Course type: seminars (15 h)
5.	Degree: <b>master, PhD</b>
6.	Semester: <b>winter</b> and <b>summer</b>
7.	Number of hours: <b>15</b>
8.	Name, Surname, academic title: <b>Alicja Dolzblasz, PhD</b> (alicja.dolzblasz@uwr.edu.pl)
9.	<b>Course description/Content:</b>  Winter semester (15 hours): Students are obliged to present in English selected research articles associated with Biology, and actively participate in discussions during the meetings.  Summer semester (15 hours): Students are obliged to present in English their research project (according to the sections: introduction, results, conclusions, and description of the plan for the future experiments) or the topic from the field of Biology.
10.	Recommended literature: The publications containing the latest science news, scientific breakthroughs and discoveries from the field of student's interest.
11.	Form of credit: Presentation, evaluation of the student's activity
12.	Language: English
13.	Number of ECTS: <b>4 per one semester</b>

1.	<b>Course name: Plant Cell Culture Techniques</b>
2.	<b>Course code conforms to USOS: 25-BI-S2-E+-PCCT</b>
3.	University department: Faculty of Biological Sciences, Botanical Garden, H. Sienkiewicza 23 Street, 50-335 Wrocław
4.	Course type: lectures
5.	Degree: <b>master</b>
6.	Semester: <b>winter</b> and <b>summer</b>
7.	Number of hours: <b>60</b>
8.	Name, Surname, academic title: <b>Krystyna Kromer, Professor</b> (krystyna.kromer@uwr.edu.pl)
9.	<b>Course description/Content:</b> Aseptic techniques; Biological factors and signals essential for cell survival and proliferation in vitro; methods of cell transformation; Primary cell cultures from tissue explants; Application of cell cultures in plant propagation and biotechnology. Achievements in culture of plant cells, tissues and organs. The course of differentiation of somatic embryos, buds, roots and callus. Methods of cloning of plant cells. The transformation of plant cells, a somaclonal variation, selection of mutants in vitro culture, and other application of this technique. Biosynthesis of secondary metabolites, plant culture in bioreactors.
10.	Recommended literature: „In vitro culture of higher plants” R.M.L. Pierik “Plant Tissue Culture” R.. Smith “Plant Tissue Culture, Development, and Biotechnology” R.N. Trigiano, D.J. Gray, CRS, 2010
11.	Form of credit: Test
12.	Language: English
13.	Number of ECTS: <b>6</b>

1.	<b>Course name: Plant physiology</b>
2.	<b>Course code conforms to USOS: 25-BI-S1-E+-PPh</b>
3.	University department: Faculty of Biological Sciences, Institute of Experimental Biology, Department of Molecular Plant Physiology (Kanonia 6/8 Street, 50-328 Wrocław)
4.	Course type: lectures (30 h) and laboratory (20 h)
5.	Degree: <b>bachelor</b>
6.	Semester: <b>winter</b>
7.	Number of hours: <b>50</b>
8.	Name, Surname, academic title: <b>Grażyna Kłobus, Professor</b> (grazyna.klobus@uwr.edu.pl) <b>Ewa Młodzińska, PhD</b> (ewa.mlodzinska@uwr.edu.pl) <b>Anna Wdowikowska, PhD</b> (anna.wdowikowska@uwr.edu.pl)

	<b>Magdalena Migocka, PhD</b> (magdalena.migocka@uwr.edu.pl)
9.	<b>Course description/Content:</b> Compartmentation in plant cell metabolism; long- and short-distance transport - mechanisms and regulation; energy conversion in biological membrane systems; photosynthetic transport of electrons and protons; PSI and PSII- structure and function; the Q cycle of cytochrome bc complexes; cyclic and non cyclic photophosphorylation; Calvin reaction in the C3, C4 and CAM plants; regulatory mechanisms of the key enzymes of the Calvin cycle; molecular mechanisms of photorespiration; regulatory mechanisms of the phloem assimilate transport; assimilation of nitrogen and sulphur
10.	Recommended literature: Plant physiology, 5 <sup>th</sup> edition, Lincoln Taiz, Eduardo Zeiger, Sinauer Associates 2010, ISBN13: 978-0878938667 Plant physiology and development, 6 <sup>th</sup> edition, Lincoln Taiz, Eduardo Zeiger, Ian M. Møller, and Angus Murphy, Sinauer Associates 2015, ISBN: 978-1-60535-255-8 Biochemistry and molecular biology of plants, 2 <sup>nd</sup> edition, Bob B. Buchanan, Wilhelm Gruissem, Russell L. Jones, Wiley Blackwell, 2015, ISBN: 978-0-470-71421-8
11.	Form of credit: Lecture: written test Laboratory: written test and evaluation of the student's work in the lab,
12.	Language: English
13.	Number of ECTS: <b>4</b>

1.	<b>Course name: Protein-protein interactions: detection, analysis and implications</b>
2.	<b>Course code conforms to USOS: 25-BI-S2-E+-PPI</b>
3.	University department: Faculty of Biological Sciences, Institute of Experimental Biology, Department of Genetics and Cell Physiology, Kanonia 6/8, 50-328 Wrocław
4.	Course type: lectures (15 h) and seminars (15 h)
5.	Degree: <b>master</b>
6.	Semester: <b>summer</b>
7.	Number of hours: <b>30</b>
8.	Name, Surname, academic title: <b>Ewa Błaszczak, PhD</b> (ewa.blaszczak@uwr.edu.pl)
9.	<b>Course description/Content:</b> The types and mechanisms of protein-protein interactions. Protein-protein interaction network (PIN) and its comparison between the species. The techniques for detection/ analysis of PPIs in vitro. The techniques for detection/ analysis of PPIs in vivo. The practical implication of the knowledge on protein-protein interactions: PPIs and drug design.
10.	Recommended literature: Alberts B., et al. "Molecular Biology of the Cell. New York: Garland Science; 2002." 5th Edition (2010) the chosen chapters;

	<p>Williamson M.P. &amp; Sutcliffe M.J. (2010), Protein-protein interactions. <i>Biochemical Society Transactions</i>, 38(4), 875-878;</p> <p>Nooren I.M. &amp; Thornton J.M. (2003), Diversity of protein-protein interactions. <i>The EMBO Journal</i>, 22(14), 3486-3492;</p> <p>Oughtred R. et al., (2016), Use of the BioGRID Database for Analysis of Yeast Protein and Genetic Interactions. <i>Cold Spring Harbor Protocols</i>.</p> <p>Corbi-Verge C. &amp; Kim P.M. (2016), Motif mediated protein-protein interactions as drug targets. <i>Cell Communication and Signaling</i>, 14(1).</p>
11.	<p>Form of credit:</p> <p>Lecture: written test</p> <p>Seminars: presentation</p>
12.	Language: English
13.	Number of ECTS: <b>4</b>