

Nazwa zajęć/ <i>Course title:</i>	<b>Botanika</b>	<b>ECTS</b>	<b>3</b>
Nazwa zajęć w j. angielskim/ <i>Course title in English:</i>	<b>Botany</b>		
Zajęcia dla kierunku studiów/ <i>Degree program name:</i>	<b>Biotechnology</b>		

Język kursu/ <i>Course language:</i>	English	Poziom studiów/ <i>Study level:</i> I		
Typ studiów/ <i>Form of studies:</i>	x intramural .. extramural	Status zajęć/ <i>Course status</i>	.. podstawowe/ <i>Basic</i> x obowiązkowe/ <i>mandatory</i> X kierunkowe/ <i>major</i> .. do wyboru/ <i>elective</i>	Semestr/ <i>Semester:</i> 2 semestr zimowy/ <i>winter semester</i> x semestr letni/ <i>summer semester</i>
Rok akademicki/ <i>Academic year:</i>		<b>2022/2023</b>	Numer katalogowy/ <i>Catalogue number:</i>	<b>BBT_BTa-1S-2L-15</b>

Koordynator zajęć/ <i>Course coordinator:</i>	<b>dr hab. inż. Ewa Muszyńska-Sadłowska</b>			
Prowadzący zajęcia/ <i>Teachers responsible for the course:</i>	dr hab. inż. Ewa Muszyńska-Sadłowska, dr inż. Wojciech Kurek			
Założenia, cele i opis zajęć/ <i>Aims, objectives and description of the course:</i>	<p>The training of biotechnology students in botany is designed to enable students to acquire qualifications useful in the course of further studies in biotechnology, thus aimed at linking knowledge of the relationship between the structure and function of plant cells, tissues and organs with practical skills of observation, analysis and synthetic presentation. This training also provides students the basics of plant systematics and plant recognition.</p> <p><u>Lectures will cover following issues:</u> Phylogenetic system of organisms and plant position. Definition of a plant. Gametophyte and sporophyte. Developmental cycles of modern representatives of the main clades of the phylogenetic tree of plants. Cycle of individual development in seed plants. Morphological structure of seedlings, juvenile, vegetative and generative stage of plants. Meristems and their regulation. Cell differentiation as the basis of histogenesis. Primary and secondary structure of the plant body. Basics of plant embryology. Adaptations of plant structure and development to different habitats. Plants as a source of raw materials.</p> <p><u>Laboratory classes will cover following issues:</u> Health and safety rules in the microscope laboratory. A reminder of microscope construction and its use. Structure of various plant tissues and organs and their relationship with functions - analysis of microscope slides. Plant structure and adaptation to different habitats - field classes in the botanical garden as well as the analysis of self-prepared microscope slides and result presentations prepared by students in subgroups. Crop plants and weeds - field classes.</p> <p>In order to help students prepare for tests and exams, lectures and exercises are posted on the MS Teams platform and supplemented with materials and tasks for (team) students' own work. The platform also provides an additional channel of communication with students and allows them to view partial grades.</p>			
Formy dydaktyczne, liczba godzin/ <i>Teaching forms, number of hours:</i>	a) lecture: hours: 30; b) laboratory classes: hours: 20; c) field classes: hours: 6; d) auditorium classes: hours: 4;			
Metody dydaktyczne/ <i>Teaching methods:</i>	lecture based on multimedia presentations, analysis of self-prepared and permanent microscope slides, observations of plants in the field, student projects in groups			
Wymagania formalne i założenia wstępne/ <i>Formal requirements and prerequisites</i>	Cell biology. It is assumed that students have the knowledge and skills required for the high school graduation exam in biology at the elementary level.			
Efekty uczenia się/ <i>Learning outcomes:</i>	treść efektu przypisanego do zajęć/ <i>the content of the effect assigned to the course:</i>		Odniesienie do efektu kierunkowego/ <i>Relation to the course outcomes</i>	Siła dla ef. kier*/ <i>Impact on the course outcomes*</i>
Wiedza (absolwent zna i rozumie) / <i>Knowledge: (the graduate knows and understands)</i>	W1	has the general knowledge of botany adjusted to the field of study, in particular knows basic terminology used in botany	K_W06 K_W08 K_W10	1 1 2
	W2	knows the position of plants in the Tree of Life, the systematics of land plants and life cycles characteristic for their main clades	K_W09 K_W10	2 1
	W3	knows the structure and functions of vegetative and generative organs of plants as well as the structural and functional adaptations of the ecological groups of plant to their habitat	K_W05 K_W06 K_W08	1 2 1
	W4	knows model plants and the most important plants supplying nutritional and industrial materials	K_W09 K_W10	2 1
Umiejętności (absolwent potrafi) / <i>Skills: (the graduate is able to)</i>	U1	performs microscopic observations of plant tissues and organs, followed by their analyses, especially in the context of linking the structure and the function, also identifying the most important useful plants and determining their systematic position	K_U04 K_U06 K_U07 K_U14 K_U20 K_U21	1 2 2 1 2 2
	U2	individually finds, critically analyses and utilised information related to botany, originating from various sources in the Polish language, also using the English language to an extent sufficient to use the sources of botanical knowledge in this language, also formulating their statements	K_U07 K_U10 K_U12	2 1 2

		briefly, logically and clearly, properly using botanical terminology in them and indicating the connections of botany to other sciences, in particular physics and chemistry	K_U18 K_U19 K_U22	1 1 2
Kompetencje (absolwent jest gotów do) /Competences: (The graduate is ready to)	K1	works efficiently individually and in a team, manifesting this by adhering to the principles of OHS, respecting copyrights, responsibility for their own work as well as readiness to succumb to the principles of teamwork and accepting responsibility for tasks executed in a group on an e-learning platform, as well as the ability to develop and implement a work schedule which ensures meeting the deadlines	K_K02 K_K03	2 1
	K2	performs self-assessment of their own knowledge, skills and competences; understands the need for continuous professional development	K_K01 K_K05	1 1
Treści programowe zapewniające uzyskanie efektów uczenia się: /Program contents ensuring the achievement of the learning outcomes:		Structure, function and development of plant structural components from the tissue level to vegetative and generative organs of seed plants. Characteristics of the processes leading to tissue and organ differentiation. Structural adaptation of plant tissues and organs to different environmental conditions. Evolutionary trends of major taxonomic groups of terrestrial plants.		
Sposób weryfikacji efektów uczenia się/ Methods of the verification of the learning outcomes:		in-class tests, evaluation of reports from observations performed during the classes, evaluation of the presentation during classes, written final exam		
Szczegóły dotyczące sposobów weryfikacji i form dokumentacji osiągniętych efektów uczenia się /Details on the verification methods and of the ways of documenting the learning outcomes:		All student's reports in the digital form and signed test sheets will be stored in the Department of Botany according to regulations acting in the Warsaw University of Life Sciences-SGGW		
Elementy i wagi mające wpływ na ocenę końcową/Elements and weights influencing the final grade:		Learning outcomes are verified by grades for 1) tests, 2) observation reports, 3) a presentation made during classes, and for 4) a written final exam. For each of these elements, the maximum number of points to be obtained is specified. The sum of points obtained by the student for each element, expressed as a % of the maximum number of points, is the basis for the final grade according to the following weights: Evaluation of laboratory classes (1-3)- 50% Written final exam (4) - 50%  Passing the classes is a prerequisite for taking the final exam.		
Miejsce realizacji zajęć/ Teaching place:		Auditorium SGGW, microscopic laboratories at the Department of Botany, Institute of Biology, Warsaw botanical gardens and SGGW campus, if necessary it is possible to carry out part of the classes online (on MS Teams platform)		
Literatura/Literature: 1. Esau K., (1965 or newer) "Plant Anatomy", Willey. 2. Lack A.J., Evans D.E. (2001 or newer) "Instant Notes in Plant Biology", BIOS Scientific. 3. Crang R., Lyons-Sobaski S., Wise R. "Plant Anatomy – a concept-based approach to the structure of seed plants", Springer. 4. Bresinsky A., Körner C., Kadereit J.W., Neuhaus G., Sonnewald U. "Strasburger's Plant Sciences", Springer 5. WWW pages and "open access" publications recommended by a teacher.				
UWAGI/ANNOTATIONS Final note is expressed according to evaluation scale acting in WULS-SGGW: 2.0 (below 50%; failed) -3.0 (passed; 50-60%) -3.5 (passed; 61-70%) -4.0 (passed; 71-80%) -4.5 (passed; 81-90%) -5.0 (passed; 91-100%).				

\*) 3 – zaawansowany i szczegółowy, 2 – znaczący, 1 – podstawowy/ 3 – significant and detailed, 2 – considerable, 1 – basic,

Wskaźniki ilościowe charakteryzujące moduł/przedmiot/Quantitative summary of the course:

Szacunkowa sumaryczna liczba godzin pracy studenta (kontaktowych i pracy własnej) niezbędna dla osiągnięcia zakładanych dla zajęć efektów uczenia się - na tej podstawie należy wypełnić pole ECTS /Estimated number of work hours per student (contact and self-study) essential to achieve the presumed learning outcomes - basis for the calculation of ECTS credits:	90 h
Łączna liczba punktów ECTS, którą student uzyskuje na zajęciach wymagających bezpośredniego udziału nauczycieli akademickich lub innych osób prowadzących zajęcia/ Total number of ECTS credits accumulated by the student during contact learning:	2.4 ECTS