

COURSE/MODULE DESCRIPTION (SYLLABUS)

1.	Course: Plant Cell Culture Techniques
2.	Language of instruction: English
3.	Faculty: Faculty of Biotechnology
4.	Course/module code: 29-BT-S1-E4-En... (the code will be set soon)
5.	Course/module type (<i>mandatory or elective</i>): elective - choice limited to Plant and Animal Cell Culture Techniques
6.	Programme: Biotechnology
7.	Study cycle (<i>1st/2nd</i>): 1st cycle
8.	Year: 2nd
9.	Semester (<i>autumn or spring</i>): spring
10.	Form of tuition and number of hours: Laboratory: 30 h
11.	Coordinator(s): Magdalena Żuk, PhD
12.	Initial requirements (<i>knowledge, skills, social competences</i>): General knowledge of biology and biochemistry and plant physiology at the level of first years of university studies and basic skills required in laboratory work, including those related to preparation and biochemical calculations as well as group work and experimental planning.
13.	Objectives: The classes are designed to familiarize with the methods of plant breeding in sterile in vitro cultures, including transgenic plants in tissue cultures as well as familiarization with practical aspects of the use of plant tissue cultures.
14.	Content: <ul style="list-style-type: none"> • Preparation of culture media (MS for shoot cultures, CIM, RIM). Discussion of the composition of standard culture media and the role of individual components. • Sterilization of plant material (seeds, green tissue). Discussing the mechanisms of action of the active agents used; solving endogenous infections; addition of various

	<p>antimicrobial and antifungal compounds to culture media. Evaluation of the purity of the sterilized plant material; determination of the phytotoxicity of the active agent, expressed in % of germinated seeds.</p> <ul style="list-style-type: none"> • Establishment of various types of cultures: cultures of shoots, hypocotyls, epicotyls, callus cultures, root culture, suspension cultures. • Familiarization with methods of plant transformation. • Conducting tissue cultures to isolate bioactive compounds (tissue cultures of transgenic plants). • Evaluation of quality, amount of secondary metabolites in various types of explants (TLC, UPLC). 	
15.	<p>Learning outcomes: Student:</p> <ul style="list-style-type: none"> • knows the basic concepts, terms and research methodology used in plant biotechnology and plant tissue cultures; • has knowledge of basic research techniques and tools used in plant breeding in tissue cultures, preparation of nutrient solutions, principles of work with tissue cultures; • knows the basic principles of health and safety at work and knows the rules of dealing with genetically modified organisms; • has skills in breeding and genetic modification of plant cells; • uses language and appropriate scientific terminology in problem discussions with specialists in the field of plant biotechnology. 	<p>Outcome symbols:</p> <p>K1_W06, K1_W08, K1_W09, K1_W10, K1_U02, K1_U05, K1_U09</p>
16.	<p>Recommended literature:</p> <p>M. K. Razdan; <u>Introduction to plant tissue culture.</u></p>	
17.	<p>Methods of verification of the assumed learning outcomes:</p> <ul style="list-style-type: none"> • Individual or group oral presentation, preparation of a report. • Written colloquium - final test. 	
18.	<p>Conditions of earning credits:</p> <ul style="list-style-type: none"> • passing the written test; • proper preparation of oral presentation and written report on the experiments performed. 	

19.	Student's workload:	
	Activity	Number of hours for the activity
	Hours of instruction (as stipulated in study programme) : Lab.: 30 h	30 h
	Student's own work: <ul style="list-style-type: none"> • preparation for classes; • preparation of results; • writing a class report; • reading the indicated literature; • preparation for the colloquium. 	20 h
	Total number of hours:	50 h
	Number of ECTS:	2 ECTS