Module of classes:

IN VITRO CULTURE OF ANIMAL TISSUES AND CELLS

ECTS	**3**
Status	**optional**
Form of final credit	**exam**
Prerequisites	**basic knowledge of animal cells morphology and physiology**

Field of study:

ANIMAL BIOENGINEERING

Profile of study	**General-academic**
The code of the form of study and the level of study	**bachelor**
Semester of study	**summer**
Language of study	**English**

The leading faculty, department and the lecturer of the module:

Name of the competent unit for the coordinator	**Faculty of Animal Sciences, Department of Nutrition, Animal Biotechnology and Fisheries**
Courese coordinator	**dr inż. Katarzyna Kirsz**

Learning outcomes of the module/subject

The code of the description component (symbol of the effect)	Description	Relation to (code)	
		field effect	discipline#
KNOWLEDGE – the student knows and/or understands:			
P6S_W1	concepts regarding the structure and function of eukaryotic cells	BIOI1_W04	RZ
P6S_W2	knows to an advanced extent the range of in vitro cell culture techniques and methods used in animal sciences, allowing for the interpretation of the results of conducted research	BIOI1_W11	RZ
P6S_W3	the importance of biodiversity for the use and development of the potential of nature to improve the quality of human life	BIOI1_W16	RZ
SKILLS – the student can:			
P6S_U1	apply methods of in vitro cell culture, use an appropriate techniques to perform research tasks	BIOI1_U09	RZ
P6S_U2	use analytical methods and modern scientific-research apparatus	BIOI1_U08	RZ
P6S_U3	carry out research tasks under the supervision of a tutor regarding the studied field, correctly interpret the results obtained and draw conclusions	BIOI1_U06	RZ
SOCIAL COMPETENCE- the student is ready to:			
P6S_K1	earning and continuous education throughout life, can organize the learning process of other people	BIOI1_K01	RZ
P6S_K2	solve complex decision problems related to the use of animals and is aware of the need to make a critical evaluation of the results of the use of various methods and decision	BIOI1_K02	RZ
P6S_K3	act in accordance with the principles of ethics in professional and social work	BIOI1_K08	RZ

Teaching content:

Lectures	**15**	**hours**
Introduction – historical outline of tissue and cell culture. Physical Aspects of Tissue Culture Laboratory. Detection of Contamination and Safety Considerations in Cell Culture Laboratory.		

Subjects of lectures	Main Types of In Vitro Cultures, Growth Cycle of Cultured Cells. Primary Cell Cultures, Dispersion of Tissues and Cells Isolation; Monolayer and Suspension Cell Culture Technique. Cell Lines Types Characterisation and Maintaince. Tissue and Cell Engineering, Application of In Vitro Cultures Methods.
Realized learning outcomes	*BIOI1_W04,W11,W16; BIOI1_K01-2, K08*
Verification methods and criteria of effects evaluation	*Credit from lectures in the form of written answers to the questions:* *on the rating 5.0 -> 90% of points* *4.5 - 81-90%* *4.0 - 71-80%* *3.5 - 61-70%* *3.0 - 55-60%* *2.0 - <55%*

Classes (laboratories, field exercises, auditorium exercises etc. …) **15** **hours**

Subjects of the classes	Cleaning and sterilization facilities; Equipment for routine cell maintenance. Work area for aseptic manipulation of cell cultures. Media preparation and storage facilities. Isolation and culture of granulose cells from ovarian follicles. Subculture of adherent and suspension cell lines. Cell counting and viability testing methods. Cryopreservation of adherent cell lines. Planning an in vitro cell culture experiment.
Realized learning outcomes	*BIOI1_U06, U08, U09*
Verification methods and criteria of effects evaluation	*Credit from classes in the form of written answers to the questions:* *on the rating 5.0 -> 90% of points* *4.5 - 81-90%* *4.0 - 71-80%* *3.5 - 61-70%* *3.0 - 55-60%* *2.0 - <55%*

Seminars **none** **hours**

Subjects of the seminars	
Realized learning outcomes	*not applicable*
Verification methods and criteria of effects evaluation	*not applicable*

Literature:

Basic	*1. Davis J.M. Basic cell culture. Oxford University Press. 2001* *2. Freshney R.I. Culture of Animal cells. A manual of basic techniques. 4th edition. Wiley-Liss. 2001*
Supplementary	*1. Fundamental techniques in cell culture. A laboratory handbook. SIGMA. 2002* *2. Jakoby W.B., Pastan I.H. Cell culture for biochemists. 2nd edition. Elsevier 1990* *3. Stokłosowa S. Three dimensional tissue and organ models in vitro: their application in basic and practical research. Fol. Histoch.Cytobiol.39: 91-96,2001.*

Structure of learning outcomes:

Dyscipline – animal husbandry and fishery (RZ)	*3*	ECTS*
Dyscipline -	*…*	ECTS*

Structure of student's activities:

classes carried out with direct participation of the teacher		39	hours	1,6	ECTS*
including:	lectures	15	hours		
	classes and seminars	15	hours		
	consultations	6	hours		
	participation in research	0	hours		
	mandatory practices and internships	0	hours		
	participation in the exam and credits	3	hours		
classes carried out with the use of e-learning		0	hours	0	ECTS*
student's own work		36	hours	1,4	ECTS*

) * - Reported to the nearest to 0,1 ECTS, where 1 ECTS = 25-30 hours of classes

) # discipline code: RZ - zootechnics and fishery, PB - biological sciences