DESCRIPTION OF THE COURSE OF STUDY

Course code	**0912.7.LEK.D.BCT**	
Name of the course in	Polish	*Podstawy technik hodowli komórek*
	English	*The basics of cell culture techniques*

1. LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES

1.1. Field of study	Medicine
1.2. Mode of study	Full-time
1.3. Level of study	Uniform Master's studies
1.4. Profile of study*	General academic
1.5. Person/s preparing the course description	dr hab. Sylwia Terpiłowska
1.6. Contact	sylwia.terpilowska@ujk.edu.pl

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	English
2.2. Prerequisites*	none

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes		Lecture (L) 15h (including 10h of e-learning); Classes (C) 15h
3.2. Place of classes		Lecture and classes in the didactic room of CM UJK
3.3. Form of assessment		Lecture – Zo (credit with grade), Classes – Zo (credit with grade)
3.4. Teaching methods		Informative lecture
3.5. Bibliography	**Required reading**	1. Cell and Tissue Culture for Medical Research Alan Doyle, J. Bryan Griffiths, ISBN: 978-0-471-85213-1 August 2000
	Further reading	1. Capes-David, R.I. Freshney, Culture of Animal Cells – a Manual of Basic Techniques and Specialized applications, Willey, 8th Edition, 2021. 2. Cell Culture Basic, Handbook, Invitrogen/Gibco

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

4.1. Course objectives *(including form of classes)*

Lecture:

To acquire basic knowledge of *in vitro* cell cultures.

(including e-learning)

To be able to apply cultures in laboratory research and medicine.

Classes:

To become familiar with the methods of working under sterile conditions and the basic techniques used in in *in vitro* research.

4.2. Detailed syllabus *(including form of classes)*

Lecture

Historical outline of animal cell culture. Types of cell and tissue cultures. Primary and secondary culture. 2D vs 3D cell cultures. Phases of growth cells in cell culture. Conditions for working with cell culture.

(including e-learning)

Sterilizations techniques. Growth requirements of cells. Types of culture media. Principle of safe work with zoonotic and human material. Biology of cells in *in vitro* culture. Selection of cell lines for experiments. Application of cell cultures in toxicology. Cell banks. Cryoprotectants in cell storage technology.

Classes:

Organization and equipment of the cell culture laboratory. Conditions necessary for in vitro culture. The principle of working under sterile conditions. Preparation of culture media. Maintenance of cell lines. Culture of adherent and non-adherent cells of various normal and cancer cell lines. Cell passage technique. Preparation of biological material for freezing (cryopreservation). Morphological evaluation of culture condition and confluence level (microscopic analysis). Methods of cell counting (analysis of the rate of cell proliferation). Assessment of cell viability.

4.3 Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
within the scope of **KNOWLEDGE:**		
W01	Know basic cellular structures and their functional specifications	A.W2.
within the scope of **ABILITIES:**		
U01	Can operate the optical microscope, also making use of immersion;	A.U1.
U02	Recognize histological structures of organs, tissues, cells and cellular structures on the optical or histological microscope images, describe and interpret the structure and relations between the structure and the function	A.U2.
U03	Use basic laboratory and molecular techniques;	B.U12.
within the scope of **SOCIAL COMPETENCE:**		
K01	Recognize his/her own limitations and self-evaluate educational deficiencies and needs	K.S5.
K02	Use reliable information sources;	K.S7.
K03	Give opinions concerning various aspects of professional activity	K.S10.
K04	Take responsibility for own decisions made during professional activities including own safety and safety of other people	K.S11.

4.4. Methods of assessment of the intended learning outcomes

Teaching outcomes *(code)*	Method of assessment (+/-)																				
	Exam oral/written*			**Test***			**Project***			**Effort in class***			**Self-study***			**Group work***			**Others* e.g. standardized test used in e-learning**		
	Form of classes			***Form of classes***			***Form of classes***			***Form of classes***			***Form of classes***			***Form of classes***			***Form of classes***		
	L	*C*	¨.	*L*	*C*	¨.	*L*	*C*	¨.	*L*	*C*	¨.	*L*	*C*	¨.	*L*	*C*	¨.	*L*	*C*	¨.
W01				+	+																
U01				+	+												+				
U02				+	+			+									+				
U03				+	+			+									+				
K01-K04				+	+			+									+				

delete as appropriate

4.5. Criteria of assessment of the intended learning outcomes

Form of classes	Grade	Criterion of assessment
lecture (L) (including e-learning)	**3**	getting 61-68% correct answers from the test
	3,5	getting 69-76% of correct answers from the test
	4	getting 77-84% of correct answers from the test
	4,5	getting 85%-92% of correct answers from the test
	5	getting 93-100% of correct answers from the test

classes (C)	**3**	Active participation in classes. From 61% to 68% of learning programme content on the basic level, replies chaotic, leading questions necessary. Test for given grade 61%-68%
	3,5	Active participation in classes. From 69% to 76% of learning programme content on the basic level, answers are systematised and require assistance from the teacher. Test for given grade 61%-68%
	4	Active participation in classes. From 77%-84% of learning programme content on the basic level, answers are systematized and independent. Solving problems in typical situations. Test for given grade 77%-84%
	4,5	Active participation in classes. From 85%-92% the scope of presented knowledge exceeds the basic level based on the supplementary literature provided. Solving problems in new complex situations. Getting from 85% to 92% of correct answers from the test.
	5	Active participation in classes. From 93%-100% the scope of presented knowledge exceeds the basic level based on independently acquired scientific sources of information. Getting from 93 to 100% of correct answers from the test.

5. BALANCE OF ECTS CREDITS – STUDENT'S WORK INPUT

Category	**Student's workload**	
	Full-time studies	**Extramural studies**
NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/	**30**	**30**
*Participation in lectures**	5	5
Participation in classes	15	15
*Preparation in the exam/ final test**		
*Others (please specify e.g. e-learning)**	10	10
INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/	**20**	**20**
*Preparation for the lecture**	10	10
*Preparation for the classes, seminars, laboratories**	10	10
*Preparation for the exam/test**		
*Gathering materials for the project/Internet query**		
Preparation of multimedia presentation		
*Others **		
TOTAL NUMBER OF HOURS	**50**	**50**
ECTS credits for the course of study	**2**	**2**

delete as appropriate

Accepted for execution *(date and legible signatures of the teachers running the course in the given academic year)*

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