

## DESCRIPTION OF THE COURSE OF STUDY

<b>Course code</b>	<b>0912-7LEK-B1.2-HE</b>	
<b>Name of the course in</b>	Polish	Histologia z embriologią
	English	Histology with embryology

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

<b>1.1. Field of study</b>	Medicine
<b>1.2. Mode of study</b>	Full-time
<b>1.3. Level of study</b>	Uniform Master's study
<b>1.4. Profile of study*</b>	General academic
<b>1.5. Person/s preparing the course description</b>	Associate professor Aleksander Szczurkowski PhD, DSc. university professor
<b>1.6. Contact</b>	aleksander.szczurkowski@ujk.edu.pl

### 2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

<b>2.1. Language of instruction</b>	English
<b>2.2. Prerequisites*</b>	Secondary school-leaving examination in biology at the advanced level

### 3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

<b>3.1. Form of classes</b>	<b>LECTURE: 35, CLASSES: 35, LABORATORIES: 30</b>	
<b>3.2. Place of classes</b>	Practical: courses in teaching rooms of the UJK	
<b>3.3. Form of assessment</b>	Exam: theoretical and practical	
<b>3.4. Teaching methods</b>	Lectures, practical classes in laboratories, discussions	
<b>3.5. Bibliography</b>	<b>Required reading</b>	1. Textbook of Histology, 4 <sup>th</sup> Edition, Elsevier 2016. Author: Leslie P. Gartner 2. Wheater's Functional Histology, 6 <sup>th</sup> Edition Elsevier 2013 A Text and Colour Atlas. Authors: Barbara Young & Geraldine O'Dowd & Phillip Woodford 3. Langman's Medical Embryology, 13 <sup>th</sup> Edition Wolters Kluwer 2014 Author: T.W. Sadler
	<b>Further reading</b>	1. Junqueira's Basic Histology Text & Atlas, 14 <sup>th</sup> Edition McGraw Hill Education 2016 Authors: Anthony L. Mescher 2. Before we are born. Essential of embryology and birth defects, 9 <sup>th</sup> Edition Elsevier 2015 Authors: K.L. Moore, T.V.N. Persaud, M.G. Torchia

#### 4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED TEACHING OUTCOMES

##### 4.1. Course objectives (including form of classes) Within the course the students should:

- C1. understand basic principles of research methods used in histology and embryology - *classes*
- C2. be able to distinguish human tissues and cell types characteristic for given organs and tissues – *labs and classes*
- C3. know general division of human tissues, their origin and functions - *lecture*
- C4. learn the competency in describing histological construction of systems and organs with special emphasis on the morphological elements which constitute the basis for their actions - *lecture*
- C5. know the basic concepts of embryogenesis with particular emphasis on organogenesis - *lecture*

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

###### Topics of histology lectures:

1. Characteristic features of epithelial cells. Specializations of the apical cell surface. Renewal of tissue.
2. General structure and function of connective tissue. Embryonic connective tissue. Connective tissue cells. Connective tissue proper. Connective tissue fibres. Extracellular matrix. Types of connective tissue
3. Adipose tissue: white adipose tissue and brown adipose tissue.
4. Cartilage: hyaline cartilage, elastic cartilage and fibrocartilage. Cartilage formation, growth and repair.
5. Bone: bone cells, bone matrix, type of bone. Osteogenesis. Bone remodelling and repair. Biologic mineralization and matrix vesicles. Metabolic aspects of bone.
6. Blood: composition of plasma, blood cells. Formation of blood cells. Bone marrow.
7. Overview and classification of muscle. Skeletal, cardiac and smooth muscle. Regeneration of muscle tissue.
8. Composition of nerve tissue. Neurons. Glial cells and neuronal activity. Myelin. Organisation of the peripheral and central nervous system. Neural plasticity and regeneration.

###### Topics of embryology lectures:

1. Gametogenesis: meiosis, oogenesis, spermatogenesis.
2. Female reproductive cycles: ovarian cycle, menstrual cycle.
3. Transportation of gametes: oocyte transport, sperm transport. Maturation of sperm.
4. Variability of oocytes and sperm
5. First week of development: phases and results of fertilization, cleavage of zygote, formation of blastocyst
6. Second week of development: formation of amniotic cavity and embryonic disk, development of chorionic sac.
7. Third week development. Gastrulation – formation of germ layers, primitive streak, notochordal process and notochord. Neurulation – formation of neural plate, neural tube and neural crests. Development of somites and intraembryonic coelom. Early development of cardiovascular system. Vasculogenesis and angiogenesis. Development of chorionic villi.
8. Development during week four to eight. Folding of embryo (head and tail folds). Germ layer derivatives. Estimation of embryonic age. Highlights of development during weeks four to eight.
9. Foetal period
10. Placenta and foetal membranes. Placenta: decidua, development of placenta, foetomaternal junction, intervillous space, amniochorionic membrane, placenta circulation
11. Pharyngeal apparatus: arches, pouches, grooves, membranes
12. Human birth defects
13. Carnegie stages

###### Topics of classes and labs

1. Rules of Procedure of histological laboratory and the basis of histological techniques
2. Epithelium
3. Connective tissue
4. Muscles
5. Nervous tissue
6. Cardiovascular system. Heart. General features of arteries and veins. Lymphatic vessels.
7. Immune system and lymphoid organs. Thymus, lymph nodes, spleen and mucosa associated lymphoid tissue

8. Digestive system: oral cavity, tongue, teeth and salivary glands, oesophagus, stomach, small and large intestine. Liver gall bladder and pancreas.
9. Respiratory system: nasal cavity, pharynx, larynx, trachea, bronchial tree and lungs.
10. Endocrine cells and tissue specialization. Endocrine organs: pituitary gland (hypophysis), adrenal glands, pancreatic islets, thyroid gland, parathyroid gland and pineal gland.
11. Urinary system: renal structure, function and vasculature. Nephron – filtration, secretion and reabsorption. Ureters, bladder and urethra.
12. Male reproductive system: testis, epididymis, vas deferens, seminal vesicles, prostate and penis.
13. Female reproductive system: ovaries, uterine tubes, cervix, uterus, placenta, and mammary glands.
14. Integumentary system. Layers of the skin. Cells of epidermis. Structure of skin. Skin glands. Skin repair. Hair and nails.
15. The Eye and ear: special sense organs.

### 4.3. Education outcomes in the discipline

Code	A student, who passed the course	Relation to teaching outcomes
<b>Within the scope of KNOWLEDGE:</b>		
W01	Knows anatomical, histological and embryological terminology in English;	A.W1.
W02	Knows basic cellular structures and their functional specifications	A.W4.
W03	Knows microarchitecture of tissues, extracellular matrix and organs;	A.W5.
W04	Knows the stages of development of human embryo, structure and function of fetal membranes and placenta as well as the stages of development of individual organs; knows the influence of harmful agents on human embryo and fetus (teratogenic agents)	A.W6.
<b>within the scope of ABILITIES:</b>		
U01	Operates the optical microscope, also making use of immersion;	A.U1.
U02	Recognizes histological structures of organs, tissues, cells and cellular structures on the optical or histological microscope images, makes descriptions and interprets the structure and relations between the structure and the function;	A U.2.
U03	Uses anatomical, histological and embryological terminology both in written and oral communication;	A.U5.

### 4.4. Methods of assessment of the intended teaching outcomes

Teaching outcomes (code)	Method of assessment (+/-)																				
	Exam oral/written*			Test*			Project*			Effort in class*			Self-study*			Group work*			Others*		
	Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes		
	L	C	Ls	L	C	Ls	L	C	...	L	C	...	L	C	...	L	C	...	L	C	..
W01	+		+	+	+																
W02	+		+	+	+																

W03	+		+		+	+													
W04	+																		
U01			+			+													
U02			+			+													
U03	+																		

*\*delete as appropriate*

4.5. Criteria of assessment of the intended teaching outcomes		
Form of classes	Grade	Criterion of assessment
lecture (L)	3	Learning programme content on the basic level, replies chaotic, leading questions necessary 61% 68%
	3,5	Learning programme content on the basic level, answers systematized, requires assistance from the teacher 69%-76%
	4	Learning programme content on the basic level, answers systematized, independent. Solving of problems in typical situations 77%-84%
	4,5	The scope of presented knowledge exceeds the basic level based on the supplementary literature provided. Solving of problems in new complex situations 85%-92%
	5	The scope of presented knowledge exceeds the basic level based on independently acquired scientific sources of information 93%-100%
classes (C)*	3	Obtaining 61%-68% correct answers at colloquium test
	3,5	Obtaining 69%-76% correct answers at colloquium test
	4	Obtaining 77%-84% correct answers at colloquium test
	4,5	Obtaining 85%-92% correct answers at colloquium test
	5	Obtaining 93%-100% correct answers at colloquium test
Practical classes- labs PC	3	Obtaining 61%-68% correct answers at colloquium test
	3,5	Obtaining 69%-76% correct answers at colloquium test
	4	Obtaining 77%-84% correct answers at colloquium test
	4,5	Obtaining 85%-92% correct answers at colloquium test
	5	Obtaining 93%-100% correct answers at colloquium test

#### Criteria for evaluation of oral answer

1. Provision of a comprehensive answer to the problem (task)
2. Skill of integration of knowledge from allied domains (disciplines)
3. Independence and/or creativity in the presentation of the scope of problems, proposals of solutions
4. Presentation of the current knowledge related with the discipline (domain)
5. Recognition of problems resulting from the task

#### Criteria for evaluation of written answer

1. Compliance with the essence of the subject matter of work (task) /
2. Provision of a comprehensive answer to the problem (task) /
3. Skill of integration of knowledge from allied domains (disciplines) /
4. Independence and/or creativity in the presentation of the scope of problems
5. Presentation of the current knowledge related with the discipline (domain), pertinent selection of literature.

### 5. BALANCE OF ECTS CREDITS – STUDENT’S WORK INPUT

Category	Student's workload
	Full-time studies
<i>NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/</i>	<b>100</b>
<i>Participation in lectures*</i>	<b>35</b>
<i>Participation in classes, seminars, laboratories*</i>	<b>65</b>
<i>Preparation in the exam/final test*</i>	
<i>Others*</i>	
<i>INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/</i>	<b>125</b>
<i>Preparation for the lecture*</i>	<b>55</b>
<i>Preparation for the classes, seminars, laboratories*</i>	<b>70</b>
<i>Preparation for the exam/test*</i>	
<i>Gathering materials for the project/Internet query*</i>	
<i>Preparation of multimedia presentation</i>	
<i>Others*</i>	
<i>TOTAL NUMBER OF HOURS</i>	<b>225</b>
ECTS credits for the course of study	<b>9</b>

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

Aleksander Szczurkowski PhD, DSc. university professor