

Module name	Animal histology and embryology
Module code	B-BE.046E
ISCED code	0511: Biology
Study cycle	I ^o
Semester	summer
Responsible for this module	dr hab. Monika Hułas-Stasiak Department Functional Anatomy and Cytobiology email: monika.hulas-stasiak@poczta.umcs.lublin.pl
Language of instruction	English
Website	
Prerequisites	Knowledge of basic issues in cytology, histology and human anatomy
ECTS	6.5
ECTS points hour equivalents	Contact hours (work with an academic teacher) – 75 - lectures: 30 - labs: 45 Non-contact hours (students' own work) – 88 - preparation for the exam: 30 - preparation for labs: 30 - literature study: 28 Total number of ECTS points for the module – 6.5
Learning outcomes verification methods	Laboratory: written partial tests oral presentation /activity during classes Lecture: final test participation in lectures
Course full description	Histological part 1. General structure of the human body - hierarchy of construction (from the cell to the body). 2. Tissues building the human body. Epithelial tissue. 3. Muscle and nervous tissue - structure, differentiation and function. 4. Connective tissue - structure, differentiation and function. 5. Digestive system - organs topography, structure and function. 6. Respiratory system - organs topography, structure and function . 7. Cardio-vascular and lymphatic systems - organs topography, structure and function. 8. Urinary system - topography of organs, structure and function. 9. Endocrine system - principle of functioning, organ topography, structure and function. 10. Nervous system - structure and function. 11. Sensory organs: sight, hearing, organ of balance 12. Skin - the epidermis and its products. Dermis and subcutaneous tissue. Embryological part 1. Male reproductive system - organs topography, structure and function.

	<p>2. Female reproductive system - organs topography, structure and function.</p> <p>3. Hormonal regulation of the male and female reproductive systems</p> <p>4. The first steps of embryo development</p> <ul style="list-style-type: none"> - Capacitation, fertilization - Cleavage (types, characteristic features, furrows: vertical, horizontal), blastula - Gastrulation , ecto, meso- and endoderm differentiation into tissue <p>5. Amphibian development</p> <ul style="list-style-type: none"> - external or internal fertilization - frog egg organisation, cleavage (holoblastic- complete cleavage, micromeres, macromeres) - structure of blastula (blastocoel, blastoderm) - gastrulation (blastopore, germ layers: ectoderm, mesoderm (grey crescent), endoderm), fate map of a frog embryo, way of gastrulation, gastrulation in detail (bottle cells, prechordal plate, chordamesoderm cells, notochord, ectoderm, endoderm, archenteron) - neurulation (neurula, ectoderm differentiation into: neural tube (in future brain and spinal cord), neural crest and epidermis) - mesoderm differentiation (paraxial mesoderm- somites, intermediate mesoderm- nephrotomes (gonads and urinary system), lateral mesoderm- splanchnic and somatic or visceral and parietal mesoderm) - organogenesis (primitive organs: notochord, neural tube, gut) - derivatives of germ layers <p>6. Bird development</p> <ul style="list-style-type: none"> - chicken reproductive system - anatomy of an egg (polylecithal, telolecithal egg) - cleavage (meroblastic, discoidal, area pellucida, area opaca, blastodisc, blastoderm, epiblast, hypoblast, blastocoel, subgerminal space, Koller's sickle region) - gastrulation (primitive streak, primitive knot=Hensen's node, gastrulation in detail, germ cell layers, intraembryonic mesoderm, extraembryonic mesoderm) - ectoderm, mesoderm, endoderm differentiation (see amphibian development) - extraembryonic tissue (chorion, amnion, allantois, and yolk sac, function) - blood circulation in chicken embryo (three systems: vitelline- yolk sac, allantois and chicken circulation) <p>7. Mammals development</p> <ul style="list-style-type: none"> -cleavage – the unique nature of mammalian cleavage - embryo compaction and cavitation (outer and inner cells) - blastula=blastocyst (embryoblast and trophoblast,
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	<p>blastocoel)</p> <ul style="list-style-type: none"> - implantation (definition, phases) - placenta (trophoblast differentiation) - placenta structure and functions - classification of placental types - gastrulation (germ disc, epiblast, hypoblast, primitive streak, amnioblast, amniotic cavity) - germ layer (ectoderm, mesoderm, endoderm differentiation) - extraembryonic tissue, (chorion, amnion, allantois, and yolk sac, differences between chicken and human) - development of monozygotic twins
Bibliography	<ol style="list-style-type: none"> 1. Sadler TW. Medical Embryology. Lippincott Williams and Wilkins, 2006, 2. Gilbert SF. Developmental biology, 9th edition. Sinauer Associates.2010 2.Stevens A., Lowe J. Human Histology, 2010
Learning outcomes	<p>KNOWLEDGE</p> <p>Student after completing the course:</p> <ol style="list-style-type: none"> 1. Understands the importance of sexual reproduction for biodiversity and evolutionary variability of organisms 2. Describes the stages of animal development - gametogenesis, fertilization, embryogenesis, organogenesis - their mechanisms and determining factors 3. Knows the mechanisms of reproduction, embryonic and fetal development of animals 4. Knows the basic notions and terminology used in histology and embryology 5. Identifies histology and embryology as the independent disciplines in the biological sciences, can define their subject, scope and methodology <p>SKILLS</p> <ol style="list-style-type: none"> 1. Has an ability to use the light microscope 2. Has an ability to prepare an oral presentation of histological and embryological issues 3. Has the ability to recognize histological and embryological slides that correspond to organs, tissues, cells and cellular structures <p>SOCIAL COMPETENCES</p> <ol style="list-style-type: none"> 1. Adopts an active attitude towards acquisition, extension, and updating the acquired knowledge 2. Has an ability to work in a team in order to solve problems, fulfil tasks efficiently and prepares presentation
Practice	-
Teaching methods	-microscopic observations

	<ul style="list-style-type: none">-demonstration of models and anatomical organs- multimedia presentation-presentation of oral speeches prepared by students- team work- didactic discussion- explanation
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