

Human Anatomy with Embryology

Educational subject description sheet

Basic information

<p>Department Faculty of Medicine</p> <p>Field of study Medical Program</p> <p>Study level long-cycle master's degree program</p> <p>Study form full-time</p> <p>Education profile general academic</p> <p>Disciplines Medical science</p> <p>Subject related to scientific research Yes</p>	<p>Didactic cycle 2016/17</p> <p>Realization year 2016/17</p> <p>Lecture languages English</p> <p>Block obligatory for passing in the course of studies</p> <p>Mandatory obligatory</p> <p>Examination examination</p> <p>Standard group A. Morphological education</p>
<p>Subject coordinator</p>	<p>Grzegorz Goncerz</p>
<p>Lecturer</p>	<p>Jerzy Walocha, Ewa Mizia, Tomasz Bereza, Tomasz Bonczar, Iwona Brzozowska, Przemysław Chmielewski, Paweł Depukat, Grzegorz Goncerz, Mateusz Hołda, Tomasz Iskra, Joanna Jaworek-Troć, Marcin Jakiel, Michał Kłosiński, Magdalena Kozerska, Mateusz Koziej, Katarzyna Piątek-Koziej, Agata Krawczyk-Ożóg, Marcin Kuniewicz, Marcin Lipski, Henryk Liszka, Aleksandra Matuszyk, Małgorzata Mazur, Jerzy Mituś, Agata Musiał, Renata Pacholczak, Artur Pasternak, Justyna Sienkiewicz, Mateusz Sporek, Justyna Wajda, Łukasz Warchoł, Jarosław Zawiliński, Dawid Maduzia</p>

<p>Period Semester 1</p>	<p>Examination -</p> <p>Activities and hours lecture: 14, dissection classes: 76</p>	<p>Number of ECTS points 0.0</p>
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<p>Period Semester 2</p>	<p>Examination examination</p> <p>Activities and hours lecture: 14, dissection classes: 76</p>	<p>Number of ECTS points 13.0</p>
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Goals

C1	To familiarize students with the structure of the human body in terms of topography, functional and clinical anatomy.
C2	To present students structures of the human body in terms of topography, functional and clinical anatomy and basics of the diagnostic.
C3	To make students aware of the anatomical terms in clinical aspect.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge - Student knows and understands:			
W1	development, structure and functions of the human body in normal and pathological conditions	O.W1	written examination, theoretical colloquiums, test
W2	anatomical, histological and embryological denominations in Polish and English	A.W1	written examination, theoretical colloquiums, test
W3	structure of human body in topographic (upper and lower extremities, thorax, abdomen, pelvis, back, neck, head) and functional (osteoarticular system, muscular system, circulatory system, respiratory system, digestive system, urinary system, genital system, nervous system and sensory organs, integuments) approaches	A.W2	written examination, theoretical colloquiums, test
W4	topographical relations between individual organs	A.W3	written examination, theoretical colloquiums, test
W5	stages of development of the human embryo, the structure and function of the membranes and placenta, stages of development of individual organs and the influence of harmful factors on the development of the embryo and fetus (teratogenic)	A.W6	written examination, theoretical colloquiums, test
Skills - Student can:			
U1	explain the anatomical basis of the physical examination	A.U3	written examination, theoretical colloquiums, test
U2	propose relations between anatomical structures on the basis of life-threatening diagnostic tests, in particular in the field of radiology (plain scans, contrast tests, computed tomography and nuclear magnetic resonance imaging)	A.U4	written examination, theoretical colloquiums, test
U3	use anatomical, histological and embryological denominations in speech and writing	A.U5	written examination, theoretical colloquiums, test
Social competences - Student is ready to:			
K1	assume responsibility for decisions taken in the course of their professional activities, including in terms of the safety of oneself and others	O.K11	written examination, theoretical colloquiums, test

K2	formulate opinions on the various aspects of the professional activity	O.K10	written examination, theoretical colloquiums, test
K3	implement the principles of professional camaraderie and cooperation in a team of specialists, including representatives of other medical professions, also in a multicultural and multinational environment	O.K9	written examination, theoretical colloquiums, test
K4	perceive and recognize own limitations and self-assessing educational deficits and needs	O.K5	written examination, theoretical colloquiums, test
K5	use objective sources of information	O.K7	written examination, theoretical colloquiums, test

Calculation of ECTS points

Semester 1

Activity form	Activity hours*
lecture	18
dissection classes	76
preparation for classes	10
preparation for examination	40
preparation for colloquium	10
preparation for classes	10
kształcenie samodzielne	37
Student workload	Hours 201
Workload involving teacher	Hours 90
Practical workload	Hours 76

* hour means 45 minutes

Semester 2

Activity form	Activity hours*
lecture	18
dissection classes	76

preparation for examination	35
preparation for classes	10
preparation for colloquium	15
kształcenie samodzielne	35
Student workload	Hours 189
Workload involving teacher	Hours 90
Practical workload	Hours 76

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes	Activities
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1.	<p>Anatomical terms related to position & movement. Connective tissue: general structure of the bone. Biological & mechanical properties of bones. Classification of bones. Joints: fibrous, cartilaginous & synovial joints. General structure of synovial joint - types of synovial joints.</p> <p>Vertebral column. General characteristics of a vertebra. Cervical, thoracic, lumbar vertebrae. Sacrum, coccyx. Intervertebral disc. Joints of vertebral column. Atlanto-occipital joints. Atlantoaxial joints. Curves of vertebral column.</p> <p>Ribs. Sternum. The thoracic cage. Bones of the shoulder girdle: scapula and clavicle. Acromioclavicular and Sternoclavicular joints.</p> <p>Introduction. Development periods. Gametogenesis. Cell divisions (mitosis, meiosis). Primordial germ cells. Conversion into male and female gametes.</p> <p>Anatomical terms related to position & movement. Connective tissue: general structure of the bone. Biological & mechanical properties of bones. Classification of bones. Joints: fibrous, cartilaginous & synovial joints. General structure of synovial joint - types of synovial joints.</p> <p>Humerus. Shoulder joint. Radius. Ulna. Bones of the hand. Elbow joint. Wrist joint. The carpal tunnel. The hand as a functional unit.</p> <p>The bony pelvis. Hip bone. Sacrum. Coccyx. Sacroiliac joints. Symphysis pubis. Greater & lesser sciatic foramina. Inguinal ligament. Sex differences of the pelvis. Femur. Acetabulum. Hip joint.</p> <p>The bony pelvis. Hip bone. Sacrum. Coccyx. Sacroiliac joints. Symphysis pubis. Greater & lesser sciatic foramina. Inguinal ligament. Sex differences of the pelvis. Femur. Acetabulum. Hip joint.</p> <p>Uterus. Uterine tube. Ovary. Oogenesis. Female reproductive cycles. Ovulation. Testis. Spermatogenesis. Sperm. Sperm maturation. Fertilization. Formation of blastocyst. Implantation. Cranial nerves - main divisions and exits from the skull.</p> <p>Tibia. Fibula. Patella. Knee joint. (intra- & extracapsular ligaments) Menisci. Bones of the foot. Ankle joint. Tarsal joints. The foot as a functional unit.</p> <p>Divisions of the skull. Bones of the Neurocranium: frontal, occipital, sphenoid, ethmoid & parietal.</p> <p>Formation of the bilaminar germ disc. Yolk sac development. Trilaminar germ disc. Gastrulation. Neurulation. Development of the somites. Formation of the notochord. Early development of cardiovascular system. Phases of embryonic development. Folding of the embryo. Cranial nerves - main divisions and exits from the skull. Temporal bone.</p> <p>Bones of the visceral cranium: mandible, hyoid, maxilla, palatine, inferior nasal concha, lacrimal, vomer & zygomatic. Anterior, middle and posterior cranial fossae.</p> <p>The bony ear Anterior, middle and posterior cranial fossae. Orbital cavity. Nasal cavity. Oral cavity. Paranasal sinuses. Temporomandibular joint. Sutures of the vault of the skull.</p> <p>Pterygopalatine, retromandibular, temporal, infratemporal cranial fossae, limitations and communication.</p> <p>Anterior, middle and posterior cranial fossae.</p>	W1, W2, W3, W4, W5, U1, U2, U3, K1, K2, K3, K4, K5	dissection classes, e-learning lecture
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2.	<p>Surface Anatomy of the Neck. Triangles of the Neck. Thyroid gland. Parathyroid. Cervical Plexus. Accessory Nerve. External & Internal Carotid Arteries. External & Internal Jugular Veins. Lymph Drainage of the Neck. Submandibular gland & Sublingual gland. Vagus & Phrenic nerves. Cervical portion of the sympathetic trunk.</p> <p>Estimation of embryonic and fetal age. Expected date of delivery. Infertility. Assisted reproductive Technology (ART). Human birth Defects. Amniocentesis. CVS. Intrauterine Growth Restriction (IUGR).</p> <p>Cranial nerves I-VI – nerve supply Muscles of facial expression. Blood and nerve supply of the face. (Facial artery & opthalmic nerve). Facial nerve. Parotid gland. Dura mater – venous sinuses. (Venous drainage of the head). Blood & nerve supply of the meninges.</p> <p>Pterygopalatine, Temporal, Infratemporal & Retromandibular fossa. Maxillary artery. Maxillary & Mandibular divisions of V-th nerve. Pterygopalatine & Otic ganglions.</p> <p>The Orbit & its walls. Structure of the eyeball. Nerve & blood supply of the eyeball. Ciliary ganglion. The accessory organs of the eyeball (muscles, eyelids, lacrimal apparatus). Optic nerve. Oculomotor nerve. Trochlear nerve. Abducent nerve. Cranial nerves I-VI – nerve supply Pterygopalatine, fossa. Maxillary artery. Maxillary division of V-th nerve. Pterygopalatine ganglion.</p> <p>Temporomandibular joint. Temporal, infratemporal & retromandibular fossa. Muscles of mastication. Mandibular division of V-th nerve. Otic ganglion.</p> <p>Development of the head and neck, pharyngeal arches. Cranial nerves VII-XII – nerve supply Pharynx. Parapharyngeal space. Tonsills. Glossopharyngeal nerve. Vagus nerve. Accessory nerve.</p> <p>Oral cavity. Teeth. Gingiva. The tongue. Tonsills. Hypoglossal nerve.</p> <p>The ear (external, middle & internal). Vestibulocochlear nerve. Cranial nerves VII-XII – nerve supply Larynx. Nasal cavity. Paranasal sinuses – structure, blood supply and innervation.</p> <p>Cranial nerves – clinical appearances</p>	W1, W2, W3, W4, W5, U1, U2, U3, K1, K2, K3, K4, K5	dissection classes, e-learning lecture
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3.	<p>The Meninges. Epi-, subdural space, subarachnoid space. Production of the cerebrospinal fluid and its circulation. The arterial supply and venous drainage of the CNS. The spinal cord. The spinal nerve. Cerebral tracts. The main anatomical terms related to the CNS.</p> <p>The brainstem – the medulla, pons and midbrain. The cerebellum. Fourth ventricle.</p> <p>Central nervous system – overview. The Meninges. Epi-, subdural space, subarachnoid space. Production of the cerebrospinal fluid and its circulation. The arterial supply and venous drainage of the CNS. The diencephalon. (thalamus, hypothalamus, epithalamus, metathalamus). III-rd ventricle.</p> <p>The telencephalon. The cerebral lobes.</p> <p>Development of central nervous system CNS – clinical aspects</p> <p>Ascending tracts of CNS</p> <p>Descending tracts of central nervous system. CNS – clinical aspects</p>	W1, W2, W3, W4, W5, U1, U2, U3, K1, K2, K3, K4, K5	dissection classes, e-learning lecture
4.	<p>Surface anatomy of the thorax (lines of orientation). Thoracic walls - muscles, vessels, nerves (intercostal spaces). The mammary gland. Diaphragm. The thoracic cavity. Mediastinum</p> <p>Pleurae. Trachea. Lungs. The Mechanism of Respiration. Endothoracic Fascia.</p> <p>Heart development. Heart defects</p> <p>Pericardium. Structure of the Heart (Chambers of the Heart) Conducting System of the Heart. Arterial Supply & Venous Drainage of the Heart.</p> <p>Thymus. Large Vessels of the Thorax: Superior & Inferior Vena Cava. Aorta. Pulmonary Veins. Pulmonary Trunk. Esophagus. Lymph Drainage of the Thorax. Azygos veins.</p> <p>Development of the vessels. Fetal circulation Thorax – innervation Vagus nerves. Phrenic nerves. Thoracic part of the sympathetic trunk.</p> <p>The axilla & its contents. Axillary artery, vein, and lymph nodes. Brachial plexus. Muscles of the scapula</p> <p>Skeletal system. Development of the bones and cartilages. Limbs development. Limbs defects. Thorax – innervation Muscles of the arm. Brachial artery & vein. Nerves of the arm</p> <p>The cubital fossa. Elbow joint. Fascial compartments of the forearm. Muscles of the anterior compartment of the forearm. Radial and ulnar artery & veins. Superficial veins of the upper limb. Nerves of the forearm.</p> <p>Examination of musculo-skeletal system – anatomical aspects Nerve/vessels compression syndromes Muscles of the lateral & posterior compartment of the forearm. Muscles of the hand. The carpal tunnel. Superficial & deep palmar arch. Skin innervation of the upper limb. Lymph nodes & lymph drainage of the upper limb.</p> <p>Upper limb – clinical correlations. Nerve/vessels compression syndromes.</p>	W1, W2, W3, W4, W5, U1, U2, U3, K1, K2, K3, K4, K5	dissection classes, e-learning lecture

5.	<p>Development of the gastrointestinal system Abdomen – the main divisions. Abdominal lines and planes. Abdominal wall (structure) - muscles, blood supply, innervation. Inguinal canal. Fascial & peritoneal lining of the abdominal walls. Surface anatomy – (landmarks): xiphoid process, costal margin, iliac crest, pubic tubercle, symphysis pubis, inguinal ligament, linea alba, umbilicus. Peritoneal cavity. Peritoneal pouches, fossae, spaces and gutters. Bursa omentalis. Peritoneal ligaments, omenta and mesenteria.</p> <p>Gastrointestinal tract: abdominal portion of esophagus, stomach, small intestine (duodenum, jejunum, ileum). Celiac artery. Superior mesenteric artery.</p> <p>Abdomen: walls and main divisions – clinical correlations. Development of the gastrointestinal system</p> <p>The large intestine (ileocecal valve, cecum, vermiform appendix, colon). Inferior mesenteric artery and vein. Pancreas. Spleen.</p> <p>The liver. Portal vein. Porto-systemic anastomoses. Gallbladder. Bile ducts.</p> <p>Abdominal organs – topography, relations. Abdomen and pelvis – imaging Retroperitoneal space. Kidneys. Suprarenal glands. Ureters. Abdominal aorta. Inferior vena cava. Lymph drainage of the abdomen.</p> <p>Orientation of the pelvis. False & true pelvis. Pelvic walls. Pelvic floor. Pelvic peritoneum. Nerves and vessels of the pelvis. Surface landmarks of the pelvis. Pelvic joints. Rectum. Urinary system –development. Urinary bladder. Urinary tract.</p> <p>Development of the genital system. Male genital organs. Perineum.</p> <p>Female genital organs.</p> <p>Clinical correlations on the pelvis (pelvic measurements in obstetrics, abnormalities and varieties of the female pelvis, fractures of the pelvis. Anatomical aspects of pregnancy.</p> <p>Regions of the lower limb. Muscles of the anterior & medial fascial compartment of the thigh. Femoral sheath. Femoral triangle. Femoral artery and vein. Subsartorial canal. Lumbar plexus.</p> <p>Clinical aspects of abdomen. Surgical anatomy. Autonomic plexuses of the abdomen and pelvis. Muscles of the buttock, subgluteal space. Greater & lesser sciatic foramina. Muscles of the posterior fascial compartment of the thigh. Sacral plexus. Pudendal nerve.</p> <p>Muscles of the posterior compartment of the leg. Posterior tibial vessels. Tibial nerve. Lymph drainage of the lower limb. Superficial veins of the lower limb. Muscles of the foot. Arterial & venous supply of the foot. Foot as a functional unit. Innervation of the skin of the lower limb.</p> <p>Clinical aspects of lower limb</p> <p>The back.</p>	W1, W2, W3, W4, W5, U1, U2, U3, K1, K2, K3, K4, K5	dissection classes, e-learning lecture
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Course advanced

Semester 1

Teaching methods:

classes / practicals, dissection classes, lecture, seminar, lecture, practical classes

Activities	Examination methods	Credit conditions
lecture	theoretical colloquiums, test	Participation in classes and lectures is obligatory.
dissection classes	theoretical colloquiums, test	Participation in classes and lectures is obligatory.

Semester 2**Teaching methods:**

classes / practicals, dissection classes, lecture, seminar, lecture, practical classes

Activities	Examination methods	Credit conditions
lecture	written examination, theoretical colloquiums, test	Participation in classes and lectures is obligatory.
dissection classes	written examination, theoretical colloquiums, test	Participation in classes and lectures is obligatory.

Additional info

1. Credit requirements

The whole material of the course has been divided into 5 parts including:

- 1) general anatomy (incl. osteology and arthrology), skull, general embryology
- 2) head and neck
- 3) central nervous system
- 4) thorax, upper limb
- 5) abdomen and pelvis; lower limb.

CAUTION: During the course of anatomy, the student is supposed to have the knowledge acquired from all previous practical and theoretical classes.

Much of the course work is carried out in the dissection rooms. Student will need to provide and bring a clean white lab coat to the dissection room, with name on the front where it can be read by staff, and wear it always in the dissection room.

Unauthorized persons are not allowed to enter the dissection rooms.

The mid-semester exams will

consist of two parts:

- a) laboratory (identification of parts of organs) – 20 questions (for each correct answer one can receive maximally 1 point), there is 30 seconds per each specimen for its recognition.

Passing the laboratory part is NOT a prerequisite for participation in the second part of the mid-semester test.

- b) theoretical (multiple choice test, matching, etc.) – 40 questions. For each correct answer you receive 1 point. The test includes embryology questions.

The list of specimens placed in the end of syllabus is a supplementary list only (it is only a help for the Students), so both during the mid-semester and final practical exams specimens out of the list can be used.

It is not possible to postpone a mid-semester test.

Only students who received ≥ 150 points ($\geq 50\%$) of all mid-semester tests get the credit and are allowed to take the final exam.

Student who received less than 150 points to be allowed to take the final exam will have to pass a credit test ($> 50\%$).

2. Attendance requirements

Participation in classes and lectures is obligatory.

Maximum six absences per two semesters are allowed – student who exceeds the allowed number of six absences fails to get the credit.

3. Type of the final exam

The final exam, held in July, is the ultimate basis for the completion of the course.

Only students who have not exceeded the allowed number of absences and have received at least 150 points (50%) of all

tests are allowed to take the final exam.

Evaluation of the anatomy course is based on the results of the final exam, however we consider also the results of the mid-semester tests.

The final exam, covering the whole material of the course consists of two parts:

a) laboratory: identification of specific structures shown on cadavers; their parts; separate organs or bones (20 questions: bones (3), skull (1), upper & lower limb (4), thorax (2), abdomen & pelvis (3), head & neck (3), central nervous system (4). A Student receives 2 points for correct answer.

Passing the laboratory part is NOT a prerequisite for participation in the second part of the final exam!!! This rule is valid for the make-up exam, as well.

b) theoretical: (multiple choice test, matching, etc., similar form to the mid-semester tests). Questions may also include problems based on histology and embryology. The test consists of 100 questions which cover the whole theoretical material.

Grading system for the final exam is as follows:

- very good (5.0) approximately $\geq 90\%$ of all available points
- good plus (4.5) $\geq 80\%$
- good (4.0) $\geq 70\%$
- satisfactory plus (3.5) $\geq 60\%$
- satisfactory (3.0) $\geq 50\%$
- failed (2.0) $< 50\%$.

A Student is exempted from the final practical exam if results of practical mid-semester tests exceed 90%.

To pass the exam one should receive at least 50% on practical and 50% on test separately.

The final grade consists of: value of points received during final practical + number of points received during final test and a bonus points (1 point for each next 10 points above 200) received during the mid-semester tests, i.e. a Student A received 218 points during all six mid-semester tests, later on the final practical exam he (she) received 28 points out of 40 and on the final test 68 points out of 100. His (her) final grade is: 2 (18 points above 200) + 28 + 65 = 95 points (63,3%) = satisfactory plus

4. Retake information

The make-up exam (held in September) has a form of both practical exam and test. The test consists of 60 questions (multiple choice and matchings). Students who passed practical exam during first option DO NOT have to repeat it in September

Entry requirements

Literature

Obligatory

1. Clinically Oriented Anatomy Moore, Dalley, 2013 8th Lippincott Williams & Wilkins
2. Clinical Neuroanatomy for Medical Students Westmoreland, Snell 2013 8th Lippincott-Raven
3. Embriology Board Review Series Fix, Dudek 2014 6th Lippincott Williams&Wilkins **Optional**

1. Thieme Atlas of Anatomy, Schuenke, Schulte, Schumacher, 2nd edition 2010 a) General Anatomy and Musculoskeletal System b) Neck and Internal Organs c) Head and Neuroanatomy
2. Gross Anatomy – Board Review Series Chung, 2014
3. Neuroanatomy - Board Review Series, Gould 2014 Lippincott Williams&Wilkins
4. Grey's Clinical Photographic Dissector of the Human Body, Loukas, Benninger, Tubbs, 2013 2nd, Elsevier
5. The Developing Human, Moore, Persaud, Torchia, 2014 11th, W.B. Saunders Comp
6. Langman's Medical Embriology, Sadler, 2013 14th, Williams & Wilkins

Standard effects

Code	Content
A.U3	explain the anatomical basis of the physical examination
A.U4	propose relations between anatomical structures on the basis of life-threatening diagnostic tests, in particular in the field of radiology (plain scans, contrast tests, computed tomography and nuclear magnetic resonance imaging)
A.U5	use anatomical, histological and embryological denominations in speech and writing
A.W1	anatomical, histological and embryological denominations in Polish and English
A.W2	structure of human body in topographic (upper and lower extremities, thorax, abdomen, pelvis, back, neck, head) and functional (osteoarticular system, muscular system, circulatory system, respiratory system, digestive system, urinary system, genital system, nervous system and sensory organs, integuments) approaches
A.W3	topographical relations between individual organs
A.W6	stages of development of the human embryo, the structure and function of the membranes and placenta, stages of development of individual organs and the influence of harmful factors on the development of the embryo and fetus (teratogenic)
O.K5	perceive and recognize own limitations and self-assessing educational deficits and needs
O.K7	use objective sources of information
O.K9	implement the principles of professional camaraderie and cooperation in a team of specialists, including representatives of other medical professions, also in a multicultural and multinational environment
O.K10	formulate opinions on the various aspects of the professional activity
O.K11	assume responsibility for decisions taken in the course of their professional activities, including in terms of the safety of oneself and others
O.W1	development, structure and functions of the human body in normal and pathological conditions